

Appendix A: Existing Conditions – Technical Calculations

Transportation Impact Study

for BioMarin 999 3rd Street




















San Rafael Campus Expansion

January 23, 2019

HCM 2010 Signalized Intersection Summary

1: Lincoln & Mission

10/01/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	103	437	14	59	525	40	9	194	35	53	354	341
Future Volume (veh/h)	103	437	14	59	525	40	9	194	35	53	354	341
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	0.99		0.97	0.99		0.94	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1660	1660	1710	1660	1660	1710	1800	1678	1728	1800	1748	1728
Adj Flow Rate, veh/h	112	475	14	64	571	39	10	211	29	58	385	151
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	2	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	148	876	26	395	634	43	58	538	72	146	871	329
Arrive On Green	0.09	0.55	0.55	0.55	0.55	0.55	0.85	0.85	0.85	0.43	0.43	0.43
Sat Flow, veh/h	1581	1602	47	840	1533	105	19	1261	168	208	2042	771
Grp Volume(v), veh/h	112	0	489	64	0	610	250	0	0	320	0	274
Grp Sat Flow(s),veh/h/ln	1581	0	1649	840	0	1638	1448	0	0	1625	0	1396
Q Serve(g_s), s	5.2	0.0	14.3	3.4	0.0	24.9	0.0	0.0	0.0	1.1	0.0	10.5
Cycle Q Clear(g_c), s	5.2	0.0	14.3	7.7	0.0	24.9	2.8	0.0	0.0	9.8	0.0	10.5
Prop In Lane	1.00		0.03	1.00		0.06	0.04		0.12	0.18		0.55
Lane Grp Cap(c), veh/h	148	0	902	395	0	677	668	0	0	750	0	596
V/C Ratio(X)	0.76	0.00	0.54	0.16	0.00	0.90	0.37	0.00	0.00	0.43	0.00	0.46
Avail Cap(c_a), veh/h	148	0	902	395	0	677	668	0	0	750	0	596
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.76	0.00	0.76	0.92	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.2	0.0	11.0	12.9	0.0	15.5	3.4	0.0	0.0	15.1	0.0	15.3
Incr Delay (d2), s/veh	30.1	0.0	2.3	0.7	0.0	14.1	1.5	0.0	0.0	1.8	0.0	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	7.1	0.8	0.0	13.8	1.3	0.0	0.0	5.0	0.0	4.4
LnGrp Delay(d),s/veh	63.2	0.0	13.3	13.6	0.0	29.6	4.8	0.0	0.0	16.9	0.0	17.9
LnGrp LOS	E		B	B		C	A			B		B
Approach Vol, veh/h		601			674			250			594	
Approach Delay, s/veh		22.6			28.1			4.8			17.3	
Approach LOS		C			C			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		45.2		36.8	10.0	35.2		36.8				
Change Period (Y+Rc), s		* 4.2		4.6	3.0	* 4.2		4.6				
Max Green Setting (Gmax), s		* 41		25.4	7.0	* 31		25.4				
Max Q Clear Time (g_c+I1), s		16.3		4.8	7.2	26.9		12.5				
Green Ext Time (p_c), s		4.9		2.1	0.0	2.1		4.3				
Intersection Summary												
HCM 2010 Ctrl Delay			20.8									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis

2: Hetherton/101 SB Off Hetherton & Mission

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑						↑↑	↑
Traffic Volume (vph)	0	461	74	33	201	0	0	0	0	211	931	436
Future Volume (vph)	0	461	74	33	201	0	0	0	0	211	931	436
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	10	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		0.95			1.00						0.95	1.00
Frbp, ped/bikes		0.99			1.00						1.00	0.97
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.98			1.00						1.00	0.85
Flt Protected		1.00			0.99						0.99	1.00
Satd. Flow (prot)		2717			1767						2961	1302
Flt Permitted		1.00			0.88						0.99	1.00
Satd. Flow (perm)		2717			1573						2961	1302
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	501	80	36	218	0	0	0	0	229	1012	474
RTOR Reduction (vph)	0	17	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	564	0	0	254	0	0	0	0	0	1241	474
Confl. Peds. (#/hr)	15		22	22		15			16			1
Confl. Bikes (#/hr)			3			2			1			3
Turn Type		NA		Perm	NA					Split	NA	custom
Protected Phases		4			8					2	2	
Permitted Phases				8								5
Actuated Green, G (s)		32.8			32.8						33.4	26.4
Effective Green, g (s)		32.8			32.8						33.4	26.4
Actuated g/C Ratio		0.44			0.44						0.45	0.35
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		1188			687						1318	458
v/s Ratio Prot		c0.21									c0.42	
v/s Ratio Perm					0.16							c0.36
v/c Ratio		0.47			0.37						0.94	1.03
Uniform Delay, d1		15.0			14.2						19.9	24.3
Progression Factor		0.55			1.50						1.00	1.00
Incremental Delay, d2		1.1			1.3						14.3	51.4
Delay (s)		9.4			22.5						34.1	75.7
Level of Service		A			C						C	E
Approach Delay (s)		9.4			22.5			0.0			45.6	
Approach LOS		A			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	35.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

3: Irwin & Mission & 101 NBO on Mission

10/01/2018



Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations										
Traffic Volume (vph)	358	19	295	149	309	3	97	1008	121	29
Future Volume (vph)	358	19	295	149	309	3	97	1008	121	29
Ideal Flow (vphpl)	2200	1800	2200	2200	2200	1800	2200	2200	1800	2200
Lane Width	9	12	10	10	9	12	12	12	12	12
Total Lost time (s)		4.2	4.2	4.2	4.2			4.2	4.2	
Lane Util. Factor		1.00	1.00	1.00	1.00			0.95	1.00	
Frbp, ped/bikes		1.00	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	
Frt		1.00	1.00	1.00	0.85			1.00	0.85	
Flt Protected		0.95	1.00	1.00	1.00			1.00	1.00	
Satd. Flow (prot)		1494	1794	1615	1471			3430	1295	
Flt Permitted		0.62	1.00	1.00	1.00			1.00	1.00	
Satd. Flow (perm)		969	1794	1615	1471			3430	1295	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	389	21	321	162	336	3	105	1096	132	32
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	44	0
Lane Group Flow (vph)	0	410	321	162	339	0	0	1201	120	0
Confl. Peds. (#/hr)							13			6
Confl. Bikes (#/hr)					2	2				2
Parking (#/hr)				0				2		
Turn Type	pm+pt	pm+pt	NA	NA	Prot		Perm	NA	Perm	
Protected Phases	5	5	2	6	6			4		
Permitted Phases	2	2					4			4
Actuated Green, G (s)		33.8	33.8	18.8	18.8			32.8	32.8	
Effective Green, g (s)		33.8	33.8	18.8	18.8			32.8	32.8	
Actuated g/C Ratio		0.45	0.45	0.25	0.25			0.44	0.44	
Clearance Time (s)		4.2	4.2	4.2	4.2			4.2	4.2	
Lane Grp Cap (vph)		512	808	404	368			1500	566	
v/s Ratio Prot		c0.12	0.18	0.10	c0.23					
v/s Ratio Perm		0.25						0.35	0.09	
v/c Ratio		0.80	0.40	0.40	0.92			0.80	0.21	
Uniform Delay, d1		18.6	13.8	23.4	27.4			18.3	13.1	
Progression Factor		0.96	0.90	1.00	1.00			0.76	0.66	
Incremental Delay, d2		9.9	1.1	3.0	30.7			2.6	0.5	
Delay (s)		27.7	13.6	26.4	58.0			16.5	9.1	
Level of Service		C	B	C	E			B	A	
Approach Delay (s)			21.5	47.8				15.6		
Approach LOS			C	D				B		
Intersection Summary										
HCM 2000 Control Delay			23.5					HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			0.86							
Actuated Cycle Length (s)			75.0					Sum of lost time (s)		12.6
Intersection Capacity Utilization			85.5%					ICU Level of Service		E
Analysis Period (min)			15							
c	Critical Lane Group									

HCM 2010 Signalized Intersection Summary

4: Lincoln & 5th

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	285	34	55	265	27	7	193	38	30	361	38
Future Volume (veh/h)	29	285	34	55	265	27	7	193	38	30	361	38
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	0.98		0.94	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1398	1545	1530	1398	1485	1530	1440	1485	1469	1440	1485	1469
Adj Flow Rate, veh/h	32	310	32	60	288	24	8	210	31	33	392	36
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	257	538	56	271	529	44	55	535	77	75	544	48
Arrive On Green	0.39	0.39	0.39	0.13	0.13	0.13	0.97	0.97	0.97	0.97	0.97	0.97
Sat Flow, veh/h	840	1372	142	816	1349	112	12	1102	158	49	1120	99
Grp Volume(v), veh/h	32	0	342	60	0	312	249	0	0	461	0	0
Grp Sat Flow(s),veh/h/ln	840	0	1513	816	0	1461	1272	0	0	1268	0	0
Q Serve(g_s), s	2.4	0.0	13.3	5.2	0.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	17.4	0.0	13.3	18.6	0.0	15.0	0.7	0.0	0.0	2.7	0.0	0.0
Prop In Lane	1.00		0.09	1.00		0.08	0.03		0.12	0.07		0.08
Lane Grp Cap(c), veh/h	257	0	593	271	0	573	667	0	0	667	0	0
V/C Ratio(X)	0.12	0.00	0.58	0.22	0.00	0.54	0.37	0.00	0.00	0.69	0.00	0.00
Avail Cap(c_a), veh/h	257	0	593	271	0	573	667	0	0	667	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.96	0.00	0.96	0.91	0.00	0.00	0.62	0.00	0.00
Uniform Delay (d), s/veh	25.5	0.0	17.9	34.3	0.0	26.4	0.6	0.0	0.0	0.6	0.0	0.0
Incr Delay (d2), s/veh	1.0	0.0	4.0	1.8	0.0	3.5	1.5	0.0	0.0	3.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	6.2	1.3	0.0	6.6	0.5	0.0	0.0	1.1	0.0	0.0
LnGrp Delay(d),s/veh	26.4	0.0	22.0	36.1	0.0	29.9	2.0	0.0	0.0	4.3	0.0	0.0
LnGrp LOS	C		C	D		C	A			A		
Approach Vol, veh/h		374			372			249			461	
Approach Delay, s/veh		22.3			30.9			2.0			4.3	
Approach LOS		C			C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		34.0		41.0		34.0		41.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		29.4		36.4		29.4		36.4				
Max Q Clear Time (g_c+I1), s		19.4		2.7		20.6		4.7				
Green Ext Time (p_c), s		1.2		1.1		1.1		2.2				
Intersection Summary												
HCM 2010 Ctrl Delay				15.3								
HCM 2010 LOS				B								

HCM Signalized Intersection Capacity Analysis

5: Hetherton & 5th

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↕↕↕	↗
Traffic Volume (vph)	0	217	150	32	228	0	0	0	0	42	892	104
Future Volume (vph)	0	217	150	32	228	0	0	0	0	42	892	104
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		1.00			1.00						0.91	1.00
Frbp, ped/bikes		0.99			1.00						1.00	0.95
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.94			1.00						1.00	0.85
Flt Protected		1.00			0.99						1.00	1.00
Satd. Flow (prot)		1665			1770						4119	1127
Flt Permitted		1.00			0.93						1.00	1.00
Satd. Flow (perm)		1665			1648						4119	1127
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	236	163	35	248	0	0	0	0	46	970	113
RTOR Reduction (vph)	0	32	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	367	0	0	283	0	0	0	0	0	1016	113
Confl. Peds. (#/hr)			15	15		14			22	22		10
Confl. Bikes (#/hr)			4			2			2			2
Parking (#/hr)											2	2
Turn Type		NA		Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases				8						2		5
Actuated Green, G (s)		32.8			32.8						33.4	26.4
Effective Green, g (s)		32.8			32.8						33.4	26.4
Actuated g/C Ratio		0.44			0.44						0.45	0.35
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		728			720						1834	396
v/s Ratio Prot		c0.22										
v/s Ratio Perm					0.17						0.25	0.10
v/c Ratio		0.50			0.39						0.55	0.29
Uniform Delay, d1		15.2			14.3						15.3	17.5
Progression Factor		0.38			1.23						0.17	0.24
Incremental Delay, d2		2.4			1.1						0.5	0.8
Delay (s)		8.3			18.7						3.1	5.0
Level of Service		A			B						A	A
Approach Delay (s)		8.3			18.7			0.0			3.3	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			6.8									A
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			75.0							10.8		
Intersection Capacity Utilization			76.5%									D
Analysis Period (min)			15									

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
6: Irwin & 5th

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	89	0	0	141	113	146	1051	10	0	0	0
Future Volume (veh/h)	120	89	0	0	141	113	146	1051	10	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.89	0.89	1.00	0.89			
Adj Sat Flow, veh/h/ln	1573	1573	0	0	1573	1620	1620	1573	1620			
Adj Flow Rate, veh/h	130	97	0	0	153	81	159	1142	10			
Adj No. of Lanes	1	1	0	0	1	0	0	2	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	0	3	0			
Cap, veh/h	260	491	0	0	266	141	182	1377	13			
Arrive On Green	0.10	0.10	0.00	0.00	0.31	0.31	0.19	0.19	0.19			
Sat Flow, veh/h	1014	1573	0	0	853	452	322	2435	22			
Grp Volume(v), veh/h	130	97	0	0	0	234	684	0	627			
Grp Sat Flow(s),veh/h/ln	1014	1573	0	0	0	1305	1384	0	1396			
Q Serve(g_s), s	9.5	4.2	0.0	0.0	0.0	11.3	36.0	0.0	32.2			
Cycle Q Clear(g_c), s	20.8	4.2	0.0	0.0	0.0	11.3	36.0	0.0	32.2			
Prop In Lane	1.00		0.00	0.00		0.35	0.23		0.02			
Lane Grp Cap(c), veh/h	260	491	0	0	0	407	782	0	789			
V/C Ratio(X)	0.50	0.20	0.00	0.00	0.00	0.57	0.87	0.00	0.79			
Avail Cap(c_a), veh/h	260	491	0	0	0	407	782	0	789			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	38.0	25.0	0.0	0.0	0.0	21.6	27.9	0.0	26.3			
Incr Delay (d2), s/veh	6.7	0.9	0.0	0.0	0.0	5.8	13.0	0.0	8.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.2	2.0	0.0	0.0	0.0	4.7	16.6	0.0	14.2			
LnGrp Delay(d),s/veh	44.8	25.9	0.0	0.0	0.0	27.4	40.9	0.0	34.5			
LnGrp LOS	D	C				C	D		C			
Approach Vol, veh/h		227			234			1311				
Approach Delay, s/veh		36.7			27.4			37.8				
Approach LOS		D			C			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		28.0		47.0		28.0						
Change Period (Y+Rc), s		4.6		4.6		4.6						
Max Green Setting (Gmax), s		23.4		42.4		23.4						
Max Q Clear Time (g_c+I1), s		22.8		38.0		13.3						
Green Ext Time (p_c), s		0.1		2.5		0.7						
Intersection Summary												
HCM 2010 Ctrl Delay					36.3							
HCM 2010 LOS					D							

HCM 2010 Signalized Intersection Summary
7: Lincoln & 4th

10/01/2018

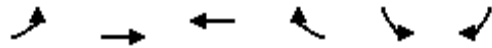


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	237	18	68	293	24	15	193	50	66	323	65
Future Volume (veh/h)	31	237	18	68	293	24	15	193	50	66	323	65
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.92	0.98		0.92	0.96		0.91	0.98		0.91
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1573	1510	1620	1573	1573	1620	1620	1573	1555	1620	1573	1555
Adj Flow Rate, veh/h	34	258	16	74	318	22	16	210	42	72	351	62
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	257	537	33	330	555	38	67	541	104	123	496	83
Arrive On Green	0.38	0.38	0.38	0.13	0.13	0.13	0.17	0.17	0.17	1.00	1.00	1.00
Sat Flow, veh/h	912	1399	87	958	1445	100	32	1073	205	135	984	164
Grp Volume(v), veh/h	34	0	274	74	0	340	268	0	0	485	0	0
Grp Sat Flow(s),veh/h/ln	912	0	1485	958	0	1545	1311	0	0	1283	0	0
Q Serve(g_s), s	2.4	0.0	10.5	5.5	0.0	15.5	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	17.9	0.0	10.5	15.9	0.0	15.5	13.4	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.06	0.06		0.16	0.15		0.13
Lane Grp Cap(c), veh/h	257	0	570	330	0	593	712	0	0	702	0	0
V/C Ratio(X)	0.13	0.00	0.48	0.22	0.00	0.57	0.38	0.00	0.00	0.69	0.00	0.00
Avail Cap(c_a), veh/h	257	0	570	330	0	593	712	0	0	702	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.93	0.00	0.93	0.81	0.00	0.00	0.61	0.00	0.00
Uniform Delay (d), s/veh	26.4	0.0	17.4	32.1	0.0	27.0	21.1	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.0	2.9	1.5	0.0	3.7	1.2	0.0	0.0	3.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	4.7	1.6	0.0	7.3	5.2	0.0	0.0	0.7	0.0	0.0
LnGrp Delay(d),s/veh	27.5	0.0	20.3	33.5	0.0	30.7	22.3	0.0	0.0	3.4	0.0	0.0
LnGrp LOS	C		C	C		C	C			A		
Approach Vol, veh/h		308			414			268			485	
Approach Delay, s/veh		21.1			31.2			22.3			3.4	
Approach LOS		C			C			C			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		33.0		42.0		33.0		42.0				
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2		* 4.2				
Max Green Setting (Gmax), s		* 29		* 38		* 29		* 38				
Max Q Clear Time (g_c+I1), s		19.9		15.4		17.9		2.0				
Green Ext Time (p_c), s		1.6		2.4		2.7		5.6				
Intersection Summary												
HCM 2010 Ctrl Delay				18.3								
HCM 2010 LOS				B								
Notes												

HCM Signalized Intersection Capacity Analysis

8: 4th & Tamalpais

10/01/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↔			↗
Traffic Volume (vph)	0	374	370	21	0	21
Future Volume (vph)	0	374	370	21	0	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.6	5.6			5.2
Lane Util. Factor		1.00	1.00			1.00
Frbp, ped/bikes		1.00	0.99			0.87
Flpb, ped/bikes		1.00	1.00			1.00
Frt		1.00	0.99			0.86
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		1573	1552			1188
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		1573	1552			1188
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	407	402	23	0	23
RTOR Reduction (vph)	0	0	2	0	0	19
Lane Group Flow (vph)	0	407	423	0	0	4
Confl. Peds. (#/hr)				39		46
Confl. Bikes (#/hr)				4		
Turn Type		NA	NA			Perm
Protected Phases		2 8	4 6			
Permitted Phases						8
Actuated Green, G (s)		51.1	52.3			11.9
Effective Green, g (s)		51.1	52.3			11.9
Actuated g/C Ratio		0.68	0.70			0.16
Clearance Time (s)						5.2
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)		1071	1082			188
v/s Ratio Prot		c0.26	c0.27			
v/s Ratio Perm						0.00
v/c Ratio		0.38	0.39			0.02
Uniform Delay, d1		5.1	4.7			26.6
Progression Factor		1.66	0.42			1.00
Incremental Delay, d2		0.2	0.2			0.0
Delay (s)		8.7	2.2			26.7
Level of Service		A	A			C
Approach Delay (s)		8.7	2.2		26.7	
Approach LOS		A	A		C	
Intersection Summary						
HCM 2000 Control Delay			5.9		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.44			
Actuated Cycle Length (s)			75.0		Sum of lost time (s)	16.4
Intersection Capacity Utilization			45.0%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

9: Hetherton & 4th

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↖	↑						↑↑↑	↗
Traffic Volume (vph)	0	259	119	174	269	0	0	0	0	99	800	175
Future Volume (vph)	0	259	119	174	269	0	0	0	0	99	800	175
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	13	10	15	11	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Lane Util. Factor		1.00	1.00	1.00	1.00						0.91	1.00
Frbp, ped/bikes		1.00	0.95	1.00	1.00						1.00	0.89
Flpb, ped/bikes		1.00	1.00	0.98	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						0.99	1.00
Satd. Flow (prot)		1625	1180	1604	1520						4262	1185
Flt Permitted		1.00	1.00	0.52	1.00						0.99	1.00
Satd. Flow (perm)		1625	1180	880	1520						4262	1185
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	282	129	189	292	0	0	0	0	108	870	190
RTOR Reduction (vph)	0	0	38	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	282	91	189	292	0	0	0	0	0	978	190
Confl. Peds. (#/hr)			40	40		22			9	9		30
Confl. Bikes (#/hr)			8			4						2
Turn Type		NA	Perm	Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases			4	8						2		5
Actuated Green, G (s)		32.8	32.8	32.8	32.8						33.4	26.4
Effective Green, g (s)		32.8	32.8	32.8	32.8						33.4	26.4
Actuated g/C Ratio		0.44	0.44	0.44	0.44						0.45	0.35
Clearance Time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		710	516	384	664						1898	417
v/s Ratio Prot		0.17			0.19							
v/s Ratio Perm			0.08	0.21							0.23	0.16
v/c Ratio		0.40	0.18	0.49	0.44						0.52	0.46
Uniform Delay, d1		14.4	12.9	15.1	14.7						15.0	18.8
Progression Factor		0.40	0.18	0.99	1.00						0.33	0.42
Incremental Delay, d2		1.6	0.7	3.5	1.6						0.9	3.0
Delay (s)		7.3	3.0	18.5	16.3						5.8	10.9
Level of Service		A	A	B	B						A	B
Approach Delay (s)		5.9			17.2			0.0			6.6	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
10: Irwin & 4th

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	214	0	0	328	60	118	1039	44	0	0	0
Future Volume (veh/h)	139	214	0	0	328	60	118	1039	44	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.95	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89			
Adj Sat Flow, veh/h/ln	1573	1573	0	0	1573	1620	1510	1573	1620			
Adj Flow Rate, veh/h	151	233	0	0	357	55	128	1129	44			
Adj No. of Lanes	1	1	0	0	1	0	1	2	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	173	604	0	0	452	70	725	1394	54			
Arrive On Green	0.77	0.77	0.00	0.00	0.13	0.13	0.17	0.17	0.17			
Sat Flow, veh/h	864	1573	0	0	1176	181	1438	2766	108			
Grp Volume(v), veh/h	151	233	0	0	0	412	128	610	563			
Grp Sat Flow(s),veh/h/ln	864	1573	0	0	0	1358	1438	1494	1380			
Q Serve(g_s), s	6.7	3.7	0.0	0.0	0.0	22.1	5.7	29.5	29.5			
Cycle Q Clear(g_c), s	28.8	3.7	0.0	0.0	0.0	22.1	5.7	29.5	29.5			
Prop In Lane	1.00		0.00	0.00		0.13	1.00		0.08			
Lane Grp Cap(c), veh/h	173	604	0	0	0	521	725	753	696			
V/C Ratio(X)	0.87	0.39	0.00	0.00	0.00	0.79	0.18	0.81	0.81			
Avail Cap(c_a), veh/h	173	604	0	0	0	521	725	753	696			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33			
Upstream Filter(I)	0.92	0.92	0.00	0.00	0.00	1.00	0.43	0.43	0.43			
Uniform Delay (d), s/veh	21.4	5.8	0.0	0.0	0.0	29.8	17.9	27.8	27.8			
Incr Delay (d2), s/veh	38.8	1.7	0.0	0.0	0.0	11.6	0.2	4.1	4.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.9	1.8	0.0	0.0	0.0	10.0	2.3	13.1	12.1			
LnGrp Delay(d),s/veh	60.2	7.5	0.0	0.0	0.0	41.4	18.1	31.9	32.3			
LnGrp LOS	E	A				D	B	C	C			
Approach Vol, veh/h		384			412			1301				
Approach Delay, s/veh		28.2			41.4			30.7				
Approach LOS		C			D			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		33.0		42.0		33.0						
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2						
Max Green Setting (Gmax), s		* 29		* 38		* 29						
Max Q Clear Time (g_c+I1), s		30.8		31.5		24.1						
Green Ext Time (p_c), s		0.0		3.3		0.8						
Intersection Summary												
HCM 2010 Ctrl Delay				32.4								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary

11: D & 3rd

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑						↑↑	
Traffic Volume (veh/h)	0	0	0	273	1077	0	0	0	0	0	217	21
Future Volume (veh/h)	0	0	0	273	1077	0	0	0	0	0	217	21
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1530	1485	0				0	1485	1530
Adj Flow Rate, veh/h				297	1171	0				0	236	12
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				494	1728	0				0	804	41
Arrive On Green				0.19	0.19	0.00				0.00	0.31	0.31
Sat Flow, veh/h				734	3149	0				0	2652	130
Grp Volume(v), veh/h				527	941	0				0	129	119
Grp Sat Flow(s),veh/h/ln				1302	1230	0				0	1411	1297
Q Serve(g_s), s				28.4	26.7	0.0				0.0	5.2	5.2
Cycle Q Clear(g_c), s				28.4	26.7	0.0				0.0	5.2	5.2
Prop In Lane				0.56		0.00				0.00		0.10
Lane Grp Cap(c), veh/h				818	1404	0				0	440	405
V/C Ratio(X)				0.64	0.67	0.00				0.00	0.29	0.30
Avail Cap(c_a), veh/h				818	1404	0				0	440	405
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				24.6	23.9	0.0				0.0	19.5	19.6
Incr Delay (d2), s/veh				3.9	2.6	0.0				0.0	1.7	1.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.1	9.6	0.0				0.0	2.2	2.1
LnGrp Delay(d),s/veh				28.5	26.5	0.0				0.0	21.2	21.4
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1468						248	
Approach Delay, s/veh					27.2						21.3	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		47.0		28.0								
Change Period (Y+Rc), s		* 4.2		4.6								
Max Green Setting (Gmax), s		* 43		23.4								
Max Q Clear Time (g_c+I1), s		30.4		7.2								
Green Ext Time (p_c), s		6.0		0.8								
Intersection Summary												
HCM 2010 Ctrl Delay				26.3								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary

12: C & 3rd

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑		↑↑				
Traffic Volume (veh/h)	0	0	0	0	1246	107	91	223	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1246	107	91	223	0	0	0	0
Number				5	2	12	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.98	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1398	1398	1440	1398	0			
Adj Flow Rate, veh/h				0	1354	77	99	242	0			
Adj No. of Lanes				0	3	1	0	2	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	3	3	3	3	0			
Cap, veh/h				0	2229	679	259	561	0			
Arrive On Green				0.00	0.19	0.19	0.10	0.10	0.00			
Sat Flow, veh/h				0	3943	1163	609	1909	0			
Grp Volume(v), veh/h				0	1354	77	185	156	0			
Grp Sat Flow(s),veh/h/ln				0	1272	1163	1246	1209	0			
Q Serve(g_s), s				0.0	24.3	4.1	8.7	9.1	0.0			
Cycle Q Clear(g_c), s				0.0	24.3	4.1	10.4	9.1	0.0			
Prop In Lane				0.00		1.00	0.53		0.00			
Lane Grp Cap(c), veh/h				0	2229	679	452	367	0			
V/C Ratio(X)				0.00	0.61	0.11	0.41	0.42	0.00			
Avail Cap(c_a), veh/h				0	2229	679	452	367	0			
HCM Platoon Ratio				1.00	0.33	0.33	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	22.4	14.2	28.1	27.6	0.0			
Incr Delay (d2), s/veh				0.0	1.2	0.3	2.7	3.6	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	8.8	1.4	4.0	3.4	0.0			
LnGrp Delay(d),s/veh				0.0	23.7	14.6	30.8	31.1	0.0			
LnGrp LOS					C	B	C	C				
Approach Vol, veh/h					1431			341				
Approach Delay, s/veh					23.2			31.0				
Approach LOS					C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		48.0		27.0								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 44		* 23								
Max Q Clear Time (g_c+I1), s		26.3		12.4								
Green Ext Time (p_c), s		7.5		1.0								
Intersection Summary												
HCM 2010 Ctrl Delay				24.7								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary

13: B & 3rd

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑						↑↑	
Traffic Volume (veh/h)	0	0	0	81	1304	0	0	0	0	0	180	46
Future Volume (veh/h)	0	0	0	81	1304	0	0	0	0	0	180	46
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.87
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1440	1398	0				0	1398	1440
Adj Flow Rate, veh/h				88	1417	0				0	196	17
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				157	2141	0				0	640	54
Arrive On Green				0.20	0.20	0.00				0.00	0.28	0.28
Sat Flow, veh/h				167	3620	0				0	2378	196
Grp Volume(v), veh/h				560	945	0				0	111	102
Grp Sat Flow(s),veh/h/ln				1356	1158	0				0	1328	1176
Q Serve(g_s), s				18.7	28.3	0.0				0.0	5.0	5.1
Cycle Q Clear(g_c), s				28.4	28.3	0.0				0.0	5.0	5.1
Prop In Lane				0.16		0.00				0.00		0.17
Lane Grp Cap(c), veh/h				884	1414	0				0	368	326
V/C Ratio(X)				0.63	0.67	0.00				0.00	0.30	0.31
Avail Cap(c_a), veh/h				884	1414	0				0	368	326
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				22.9	22.9	0.0				0.0	21.4	21.4
Incr Delay (d2), s/veh				3.4	2.5	0.0				0.0	2.1	2.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.6	9.6	0.0				0.0	2.0	1.9
LnGrp Delay(d),s/veh				26.3	25.5	0.0				0.0	23.5	23.9
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1505						213	
Approach Delay, s/veh					25.8						23.7	
Approach LOS					C						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				
Phs Duration (G+Y+Rc), s		50.0		25.0				
Change Period (Y+Rc), s		* 4.2		* 4.2				
Max Green Setting (Gmax), s		* 46		* 21				
Max Q Clear Time (g_c+I1), s		30.4		7.1				
Green Ext Time (p_c), s		7.0		0.6				

Intersection Summary	
HCM 2010 Ctrl Delay	25.5
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary

14: A & 3rd

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				←↑↑			↑	↑			↑	
Traffic Volume (veh/h)	0	0	0	34	1173	69	181	112	0	0	119	21
Future Volume (veh/h)	0	0	0	34	1173	69	181	112	0	0	119	21
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	0.96		1.00	1.00		0.93
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1800	1748	1800	1835	1835	0	0	1835	1890
Adj Flow Rate, veh/h				37	1275	66	197	122	0	0	129	13
Adj No. of Lanes				0	3	0	1	1	0	0	1	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	3	0	3	3	0	0	3	3
Cap, veh/h				65	2380	127	389	685	0	0	377	38
Arrive On Green				0.17	0.17	0.17	0.02	0.12	0.00	0.00	0.26	0.26
Sat Flow, veh/h				127	4637	248	1748	1835	0	0	1449	146
Grp Volume(v), veh/h				509	423	447	197	122	0	0	0	142
Grp Sat Flow(s),veh/h/ln				1741	1590	1681	1748	1835	0	0	0	1595
Q Serve(g_s), s				20.1	18.1	18.2	0.0	4.5	0.0	0.0	0.0	5.4
Cycle Q Clear(g_c), s				20.1	18.1	18.2	0.0	4.5	0.0	0.0	0.0	5.4
Prop In Lane				0.07		0.15	1.00		0.00	0.00		0.09
Lane Grp Cap(c), veh/h				894	816	863	389	685	0	0	0	415
V/C Ratio(X)				0.57	0.52	0.52	0.51	0.18	0.00	0.00	0.00	0.34
Avail Cap(c_a), veh/h				894	816	863	389	685	0	0	0	415
HCM Platoon Ratio				0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				23.5	22.7	22.7	28.7	22.6	0.0	0.0	0.0	22.5
Incr Delay (d2), s/veh				2.6	2.3	2.2	4.6	0.6	0.0	0.0	0.0	2.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.4	8.5	9.0	4.5	2.4	0.0	0.0	0.0	2.6
LnGrp Delay(d),s/veh				26.1	25.0	24.9	33.4	23.1	0.0	0.0	0.0	24.8
LnGrp LOS				C	C	C	C	C				C
Approach Vol, veh/h				1378			319			142		
Approach Delay, s/veh				25.4			29.5			24.8		
Approach LOS				C			C			C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			8.0	24.0		43.0		32.0				
Change Period (Y+Rc), s			4.0	4.5		4.5		4.0				
Max Green Setting (Gmax), s			4.0	19.5		38.5		28.0				
Max Q Clear Time (g_c+I1), s			2.0	7.4		22.1		6.5				
Green Ext Time (p_c), s			0.3	0.7		10.8		0.8				
Intersection Summary												
HCM 2010 Ctrl Delay			26.1									
HCM 2010 LOS			C									

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

BioMarin
Existing Conditions
AM Peak Hour

Intersection 15 Brooks St/3rd St Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	12	10	85.9%	13.3	4.0	B
	Through						
	Right Turn						
	Subtotal	12	10	85.9%	13.3	4.0	B
SB	Left Turn						
	Through						
	Right Turn	1	1	73.6%	0.7	1.5	A
	Subtotal	1	1	73.6%	0.7	1.5	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	21	18	85.9%	1.8	0.5	A
	Through	1,271	1,260	99.1%	1.6	0.2	A
	Right Turn	8	8	101.2%	1.4	1.8	A
	Subtotal	1,300	1,286	98.9%	1.6	0.2	A
Total		1,313	1,297	98.8%	1.7	0.2	A

Intersection 16 Lindaro St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	65	69	106.4%	14.9	3.9	B
	Through	9	8	85.9%	12.2	15.3	B
	Right Turn						
	Subtotal	74	77	103.9%	14.7	4.6	B
SB	Left Turn						
	Through	34	28	82.3%	15.8	8.5	B
	Right Turn	8	8	101.2%	8.7	8.7	A
	Subtotal	42	36	85.9%	14.7	6.3	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	297	303	102.1%	7.5	1.7	A
	Through	1,227	1,210	98.6%	4.5	0.3	A
	Right Turn	22	24	108.7%	4.3	1.2	A
	Subtotal	1,546	1,537	99.4%	5.1	0.6	A
Total		1,662	1,650	99.3%	5.7	0.7	A

HCM 2010 Signalized Intersection Summary
 17: Lincoln & 3rd

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				←←←				←			←	
Traffic Volume (veh/h)	0	0	0	147	1452	42	27	154	0	0	253	143
Future Volume (veh/h)	0	0	0	147	1452	42	27	154	0	0	253	143
Number				1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.92	1.00		1.00	1.00		0.91
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Adj Sat Flow, veh/h/ln				1620	1573	1620	1620	1573	0	0	1510	1555
Adj Flow Rate, veh/h				160	1578	42	29	167	0	0	275	143
Adj No. of Lanes				0	3	0	0	1	0	0	1	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	3	0	3	3	0	0	3	3
Cap, veh/h				212	2232	61	55	208	0	0	261	136
Arrive On Green				0.18	0.18	0.18	0.11	0.11	0.00	0.00	0.11	0.11
Sat Flow, veh/h				383	4034	110	0	635	0	0	798	415
Grp Volume(v), veh/h				649	544	587	196	0	0	0	0	418
Grp Sat Flow(s),veh/h/ln				1554	1431	1542	635	0	0	0	0	1213
Q Serve(g_s), s				29.7	26.6	26.7	0.0	0.0	0.0	0.0	0.0	24.5
Cycle Q Clear(g_c), s				29.7	26.6	26.7	24.5	0.0	0.0	0.0	0.0	24.5
Prop In Lane				0.25		0.07	0.15		0.00	0.00		0.34
Lane Grp Cap(c), veh/h				860	792	853	263	0	0	0	0	396
V/C Ratio(X)				0.76	0.69	0.69	0.75	0.00	0.00	0.00	0.00	1.06
Avail Cap(c_a), veh/h				860	792	853	263	0	0	0	0	396
HCM Platoon Ratio				0.33	0.33	0.33	0.33	0.33	1.00	1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				25.8	24.6	24.6	26.9	0.0	0.0	0.0	0.0	33.5
Incr Delay (d2), s/veh				6.1	4.8	4.5	17.5	0.0	0.0	0.0	0.0	60.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				14.3	11.6	12.5	5.1	0.0	0.0	0.0	0.0	14.9
LnGrp Delay(d),s/veh				32.0	29.4	29.1	44.4	0.0	0.0	0.0	0.0	93.9
LnGrp LOS				C	C	C	D					F
Approach Vol, veh/h				1780			196			418		
Approach Delay, s/veh				30.2			44.4			93.9		
Approach LOS				C			D			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				29.0		46.0		29.0				
Change Period (Y+Rc), s				4.5		4.5		4.5				
Max Green Setting (Gmax), s				24.5		41.5		24.5				
Max Q Clear Time (g_c+I1), s				26.5		31.7		26.5				
Green Ext Time (p_c), s				0.0		5.9		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				42.5								
HCM 2010 LOS				D								

HCM 2010 Signalized Intersection Summary
 18: Tamalpais & 3rd

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					←←←		←	↑			↑	
Traffic Volume (veh/h)	0	0	0	219	1574	14	45	37	0	0	40	9
Future Volume (veh/h)	0	0	0	219	1574	14	45	37	0	0	40	9
Number				1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.92	0.91		1.00	1.00		0.88
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Adj Sat Flow, veh/h/ln				1440	1398	1440	1398	1398	0	0	1398	1440
Adj Flow Rate, veh/h				238	1711	14	49	40	0	0	43	2
Adj No. of Lanes				0	3	0	1	1	0	0	1	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	3	0	3	3	0	0	3	3
Cap, veh/h				293	2261	19	314	350	0	0	292	14
Arrive On Green				0.21	0.21	0.21	0.25	0.25	0.00	0.00	0.25	0.25
Sat Flow, veh/h				460	3547	30	982	1398	0	0	1165	54
Grp Volume(v), veh/h				712	598	654	49	40	0	0	0	45
Grp Sat Flow(s),veh/h/ln				1375	1272	1390	982	1398	0	0	0	1219
Q Serve(g_s), s				37.0	32.9	33.0	3.1	1.7	0.0	0.0	0.0	2.2
Cycle Q Clear(g_c), s				37.0	32.9	33.0	5.2	1.7	0.0	0.0	0.0	2.2
Prop In Lane				0.33		0.02	1.00		0.00	0.00		0.04
Lane Grp Cap(c), veh/h				876	811	886	314	350	0	0	0	306
V/C Ratio(X)				0.81	0.74	0.74	0.16	0.11	0.00	0.00	0.00	0.15
Avail Cap(c_a), veh/h				876	811	886	314	350	0	0	0	306
HCM Platoon Ratio				0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				25.3	23.7	23.8	23.9	21.7	0.0	0.0	0.0	21.9
Incr Delay (d2), s/veh				8.1	5.9	5.5	1.1	0.7	0.0	0.0	0.0	1.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				16.0	12.9	14.0	0.9	0.7	0.0	0.0	0.0	0.8
LnGrp Delay(d),s/veh				33.4	29.7	29.2	25.0	22.3	0.0	0.0	0.0	22.9
LnGrp LOS				C	C	C	C	C				C
Approach Vol, veh/h					1963			89			45	
Approach Delay, s/veh					30.9			23.8			22.9	
Approach LOS					C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				23.0		52.0		23.0				
Change Period (Y+Rc), s				* 4.2		4.2		* 4.2				
Max Green Setting (Gmax), s				* 19		47.8		* 19				
Max Q Clear Time (g_c+I1), s				7.2		39.0		4.2				
Green Ext Time (p_c), s				0.2		6.0		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay				30.4								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary
 19: Hetherton & 3rd

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙ ↘ ↗ ↖							↑ ↑ ↑	↗
Traffic Volume (veh/h)	0	0	0	408	1378	0	0	0	0	0	729	364
Future Volume (veh/h)	0	0	0	408	1378	0	0	0	0	0	729	364
Number				1	6	16					3	8
Initial Q (Qb), veh				0	0	0					0	0
Ped-Bike Adj(A_pbT)				1.00		1.00					1.00	0.86
Parking Bus, Adj				1.00	1.00	1.00					1.00	1.00
Adj Sat Flow, veh/h/ln				1545	1573	0					0	1573
Adj Flow Rate, veh/h				443	1498	0					0	792
Adj No. of Lanes				1	3	0					0	3
Peak Hour Factor				0.92	0.92	0.92					0.92	0.92
Percent Heavy Veh, %				3	3	0					0	3
Cap, veh/h				861	2454	0					0	1546
Arrive On Green				0.17	0.17	0.00					0.00	0.12
Sat Flow, veh/h				1471	4718	0					0	4435
Grp Volume(v), veh/h				443	1498	0					0	792
Grp Sat Flow(s),veh/h/ln				1471	1573	0					0	1431
Q Serve(g_s), s				20.8	22.0	0.0					0.0	13.0
Cycle Q Clear(g_c), s				20.8	22.0	0.0					0.0	13.0
Prop In Lane				1.00		0.00					0.00	1.00
Lane Grp Cap(c), veh/h				861	2454	0					0	1546
V/C Ratio(X)				0.51	0.61	0.00					0.00	0.51
Avail Cap(c_a), veh/h				861	2454	0					0	1546
HCM Platoon Ratio				0.33	0.33	1.00					1.00	0.33
Upstream Filter(I)				1.00	1.00	0.00					0.00	1.00
Uniform Delay (d), s/veh				23.5	24.0	0.0					0.0	26.9
Incr Delay (d2), s/veh				2.2	1.1	0.0					0.0	1.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0					0.0	0.0
%ile BackOfQ(50%),veh/ln				9.0	9.8	0.0					0.0	5.3
LnGrp Delay(d),s/veh				25.7	25.2	0.0					0.0	28.1
LnGrp LOS				C	C						C	E
Approach Vol, veh/h					1941						1175	
Approach Delay, s/veh					25.3						42.4	
Approach LOS					C						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs						6		8				
Phs Duration (G+Y+Rc), s						43.0		32.0				
Change Period (Y+Rc), s						4.0		5.0				
Max Green Setting (Gmax), s						39.0		27.0				
Max Q Clear Time (g_c+I1), s						24.0		28.2				
Green Ext Time (p_c), s						9.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay					31.8							
HCM 2010 LOS					C							
Notes												

HCM 2010 Signalized Intersection Summary
 20: Irwin & 3rd/3rd St

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑	↑	↑↑↑				
Traffic Volume (veh/h)	0	0	0	0	963	109	833	1097	0	0	0	0
Future Volume (veh/h)	0	0	0	0	963	109	833	1097	0	0	0	0
Number				1	6	16	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.94	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1485	1485	1398	1398	0			
Adj Flow Rate, veh/h				0	1047	81	917	1175	0			
Adj No. of Lanes				0	3	1	2	2	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	3	3	3	3	0			
Cap, veh/h				0	1379	403	1438	1510	0			
Arrive On Green				0.00	0.34	0.34	0.18	0.18	0.00			
Sat Flow, veh/h				0	4189	1186	2663	2796	0			
Grp Volume(v), veh/h				0	1047	81	917	1175	0			
Grp Sat Flow(s),veh/h/ln				0	1352	1186	1331	1398	0			
Q Serve(g_s), s				0.0	17.2	3.6	23.9	30.1	0.0			
Cycle Q Clear(g_c), s				0.0	17.2	3.6	23.9	30.1	0.0			
Prop In Lane				0.00		1.00	1.00		0.00			
Lane Grp Cap(c), veh/h				0	1379	403	1438	1510	0			
V/C Ratio(X)				0.00	0.76	0.20	0.64	0.78	0.00			
Avail Cap(c_a), veh/h				0	1379	403	1438	1510	0			
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	22.0	17.5	24.0	26.5	0.0			
Incr Delay (d2), s/veh				0.0	4.0	1.1	2.2	4.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	6.9	1.3	9.3	12.5	0.0			
LnGrp Delay(d),s/veh				0.0	26.0	18.7	26.2	30.6	0.0			
LnGrp LOS					C	B	C	C				
Approach Vol, veh/h					1128			2092				
Approach Delay, s/veh					25.5			28.6				
Approach LOS					C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				45.0		30.0						
Change Period (Y+Rc), s				4.5		4.5						
Max Green Setting (Gmax), s				40.5		25.5						
Max Q Clear Time (g_c+I1), s				32.1		19.2						
Green Ext Time (p_c), s				6.3		3.1						
Intersection Summary												
HCM 2010 Ctrl Delay				27.5								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary
 21: D & 2nd

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑		↑	↑	
Traffic Volume (veh/h)	0	1838	76	0	0	0	0	0	240	64	423	0
Future Volume (veh/h)	0	1838	76	0	0	0	0	0	240	64	423	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1660	1710				0	1573	1620	1748	1748	0
Adj Flow Rate, veh/h	0	1998	76				0	0	245	70	460	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	0	0	0				0	0	1126	1141	1488	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.85	0.28	0.28	0.00
Sat Flow, veh/h		0					0	0	1323	1111	1748	0
Grp Volume(v), veh/h		0.0					0	0	245	70	460	0
Grp Sat Flow(s),veh/h/ln							0	0	1323	1111	1748	0
Q Serve(g_s), s							0.0	0.0	1.0	1.5	6.4	0.0
Cycle Q Clear(g_c), s							0.0	0.0	1.0	2.5	6.4	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	1126	1141	1488	0
V/C Ratio(X)							0.00	0.00	0.22	0.06	0.31	0.00
Avail Cap(c_a), veh/h							0	0	1126	1141	1488	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh							0.0	0.0	0.4	2.9	4.0	0.0
Incr Delay (d2), s/veh							0.0	0.0	0.4	0.1	0.5	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	0.5	0.5	3.4	0.0
LnGrp Delay(d),s/veh							0.0	0.0	0.9	3.0	4.5	0.0
LnGrp LOS									A	A	A	
Approach Vol, veh/h								245			530	
Approach Delay, s/veh								0.9			4.3	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				31.0				31.0				
Change Period (Y+Rc), s				4.6				4.6				
Max Green Setting (Gmax), s				26.4				26.4				
Max Q Clear Time (g_c+I1), s				8.4				3.0				
Green Ext Time (p_c), s				1.3				0.7				
Intersection Summary												
HCM 2010 Ctrl Delay				3.2								
HCM 2010 LOS				A								

HCM 2010 Signalized Intersection Summary

22: C & 2nd

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑↑				
Traffic Volume (veh/h)	98	2045	0	0	0	0	0	192	85	0	0	0
Future Volume (veh/h)	98	2045	0	0	0	0	0	192	85	0	0	0
Number	1	6	16				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1440	1485	0				0	1485	1440			
Adj Flow Rate, veh/h	107	2223	0				0	209	87			
Adj No. of Lanes	0	3	0				0	2	0			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0				0	3	3			
Cap, veh/h	149	2417	0				0	556	222			
Arrive On Green	0.20	0.20	0.00				0.00	0.28	0.28			
Sat Flow, veh/h	157	3993	0				0	2004	801			
Grp Volume(v), veh/h	821	1509	0				0	153	143			
Grp Sat Flow(s),veh/h/ln	1446	1352	0				0	1485	1320			
Q Serve(g_s), s	34.4	41.1	0.0				0.0	6.2	6.6			
Cycle Q Clear(g_c), s	41.9	41.1	0.0				0.0	6.2	6.6			
Prop In Lane	0.13		0.00				0.00		0.61			
Lane Grp Cap(c), veh/h	930	1637	0				0	412	366			
V/C Ratio(X)	0.88	0.92	0.00				0.00	0.37	0.39			
Avail Cap(c_a), veh/h	930	1637	0				0	412	366			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	28.5	28.3	0.0				0.0	21.8	22.0			
Incr Delay (d2), s/veh	11.9	10.1	0.0				0.0	2.5	3.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	19.9	17.7	0.0				0.0	2.8	2.7			
LnGrp Delay(d),s/veh	40.5	38.4	0.0				0.0	24.4	25.1			
LnGrp LOS	D	D						C	C			
Approach Vol, veh/h		2330						296				
Approach Delay, s/veh		39.1						24.7				
Approach LOS		D						C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				25.0		50.0						
Change Period (Y+Rc), s				* 4.2		4.6						
Max Green Setting (Gmax), s				* 21		45.4						
Max Q Clear Time (g_c+I1), s				8.6		43.9						
Green Ext Time (p_c), s				1.9		1.5						
Intersection Summary												
HCM 2010 Ctrl Delay				37.5								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

23: B & 2nd

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑		↑	↑	
Traffic Volume (veh/h)	0	2064	59	0	0	0	0	0	152	62	207	0
Future Volume (veh/h)	0	2064	59	0	0	0	0	0	152	62	207	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1485	1382				0	1573	1591	1545	1485	0
Adj Flow Rate, veh/h	0	2243	60				0	0	148	67	225	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	0	0	0				0	0	1077	1135	1238	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.83	0.28	0.28	0.00
Sat Flow, veh/h		0					0	0	1292	1070	1485	0
Grp Volume(v), veh/h		0.0					0	0	148	67	225	0
Grp Sat Flow(s),veh/h/ln							0	0	1292	1070	1485	0
Q Serve(g_s), s							0.0	0.0	0.6	1.3	3.1	0.0
Cycle Q Clear(g_c), s							0.0	0.0	0.6	1.8	3.1	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	1077	1135	1238	0
V/C Ratio(X)							0.00	0.00	0.14	0.06	0.18	0.00
Avail Cap(c_a), veh/h							0	0	1077	1135	1238	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh							0.0	0.0	0.4	2.5	2.8	0.0
Incr Delay (d2), s/veh							0.0	0.0	0.3	0.1	0.3	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	0.2	0.4	1.4	0.0
LnGrp Delay(d),s/veh							0.0	0.0	0.7	2.6	3.1	0.0
LnGrp LOS									A	A	A	
Approach Vol, veh/h								148			292	
Approach Delay, s/veh								0.7			3.0	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				27.0				27.0				
Change Period (Y+Rc), s				4.5				4.5				
Max Green Setting (Gmax), s				22.5				22.5				
Max Q Clear Time (g_c+I1), s				5.1				2.6				
Green Ext Time (p_c), s				0.7				0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				2.2								
HCM 2010 LOS				A								

HCM 2010 Signalized Intersection Summary
 24: A & 2nd

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑↑							↑↑		↖	↑	
Traffic Volume (veh/h)	85	2006	178	0	0	0	0	225	13	45	103	0
Future Volume (veh/h)	85	2006	178	0	0	0	0	225	13	45	103	0
Number	5	2	12				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96				1.00		0.96	0.98		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1748	1800				0	1660	1710	1660	1660	0
Adj Flow Rate, veh/h	92	2180	179				0	245	9	49	112	0
Adj No. of Lanes	0	3	0				0	2	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	100	2506	210				0	692	25	293	530	0
Arrive On Green	0.19	0.19	0.19				0.00	0.22	0.22	0.01	0.11	0.00
Sat Flow, veh/h	177	4445	372				0	3182	113	1581	1660	0
Grp Volume(v), veh/h	901	748	801				0	124	130	49	112	0
Grp Sat Flow(s),veh/h/ln	1739	1590	1666				0	1577	1635	1581	1660	0
Q Serve(g_s), s	38.3	34.1	35.0				0.0	5.0	5.0	0.0	4.6	0.0
Cycle Q Clear(g_c), s	38.3	34.1	35.0				0.0	5.0	5.0	0.0	4.6	0.0
Prop In Lane	0.10		0.22				0.00		0.07	1.00		0.00
Lane Grp Cap(c), veh/h	980	897	939				0	352	365	293	530	0
V/C Ratio(X)	0.92	0.83	0.85				0.00	0.35	0.36	0.17	0.21	0.00
Avail Cap(c_a), veh/h	980	897	939				0	352	365	293	530	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.9	27.2	27.6				0.0	24.6	24.6	28.0	25.0	0.0
Incr Delay (d2), s/veh	14.9	9.0	9.7				0.0	2.8	2.7	1.2	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.4	17.3	18.7				0.0	2.4	2.5	1.0	2.3	0.0
LnGrp Delay(d),s/veh	43.8	36.3	37.3				0.0	27.4	27.3	29.2	25.9	0.0
LnGrp LOS	D	D	D					C	C	C	C	
Approach Vol, veh/h		2451						254			161	
Approach Delay, s/veh		39.4						27.3			26.9	
Approach LOS		D						C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		47.0		28.2			7.2	21.0				
Change Period (Y+Rc), s		4.6		* 4.2			* 4.2	* 4.2				
Max Green Setting (Gmax), s		42.4		* 24			* 3	* 17				
Max Q Clear Time (g_c+I1), s		40.3		6.6			2.0	7.0				
Green Ext Time (p_c), s		2.1		0.7			0.0	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			37.6									
HCM 2010 LOS			D									
Notes												

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

BioMarin
Existing Conditions
AM Peak Hour

Intersection 25 Brooks St/2nd St Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	21	19	89.4%	15.6	8.1	C
	Through						
	Right Turn						
	Subtotal	21	19	89.4%	15.6	8.1	C
EB	Left Turn	12	9	76.7%	3.3	0.7	A
	Through	2,054	2,053	100.0%	2.4	0.2	A
	Right Turn						
	Subtotal	2,066	2,063	99.8%	2.4	0.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,087	2,081	99.7%	2.5	0.2	A

Intersection 26 Lindaro St/2nd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	44	49	112.1%	16.5	5.9	B
	Right Turn	226	227	100.6%	15.0	3.5	B
	Subtotal	270	277	102.5%	15.3	3.2	B
SB	Left Turn	56	50	88.7%	28.1	3.7	C
	Through	275	281	102.1%	26.9	2.9	C
	Right Turn						
	Subtotal	331	330	99.8%	27.1	2.8	C
EB	Left Turn	30	27	90.8%	11.3	3.7	B
	Through	2,046	2,031	99.3%	11.3	1.0	B
	Right Turn	39	40	101.9%	9.0	3.5	A
	Subtotal	2,115	2,098	99.2%	11.2	1.0	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,716	2,706	99.6%	13.6	0.9	B

HCM 2010 Signalized Intersection Summary
 27: Lincoln & 2nd

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		THRU	THRU					THRU	THRU		THRU	THRU
Traffic Volume (veh/h)	113	2181	34	0	0	0	0	85	43	114	231	0
Future Volume (veh/h)	113	2181	34	0	0	0	0	85	43	114	231	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1398	1398				0	1398	1398	1382	1342	0
Adj Flow Rate, veh/h	123	2371	19				0	92	35	124	251	0
Adj No. of Lanes	0	4	1				0	1	1	0	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	122	2528	598				0	500	411	289	558	0
Arrive On Green	0.18	0.18	0.18				0.00	0.36	0.36	0.12	0.12	0.00
Sat Flow, veh/h	230	4763	1126				0	1398	1151	591	1621	0
Grp Volume(v), veh/h	741	1753	19				0	92	35	196	179	0
Grp Sat Flow(s),veh/h/ln	1387	1202	1126				0	1398	1151	991	1160	0
Q Serve(g_s), s	39.8	35.8	1.0				0.0	3.4	1.5	11.6	10.8	0.0
Cycle Q Clear(g_c), s	39.8	35.8	1.0				0.0	3.4	1.5	15.0	10.8	0.0
Prop In Lane	0.17		1.00				0.00		1.00	0.63		0.00
Lane Grp Cap(c), veh/h	736	1914	598				0	500	411	432	415	0
V/C Ratio(X)	1.01	0.92	0.03				0.00	0.18	0.09	0.45	0.43	0.00
Avail Cap(c_a), veh/h	736	1914	598				0	500	411	432	415	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.9	29.3	15.0				0.0	16.6	16.0	28.6	26.0	0.0
Incr Delay (d2), s/veh	34.9	8.4	0.1				0.0	0.8	0.4	3.4	3.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.4	13.4	0.3				0.0	1.4	0.5	4.3	3.8	0.0
LnGrp Delay(d),s/veh	65.9	37.7	15.0				0.0	17.4	16.4	32.0	29.3	0.0
LnGrp LOS	F	D	B					B	B	C	C	
Approach Vol, veh/h		2513						127			375	
Approach Delay, s/veh		45.8						17.1			30.7	
Approach LOS		D						B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		44.0		31.0				31.0				
Change Period (Y+Rc), s		* 4.2		* 4.2				* 4.2				
Max Green Setting (Gmax), s		* 40		* 27				* 27				
Max Q Clear Time (g_c+I1), s		41.8		5.4				17.0				
Green Ext Time (p_c), s		0.0		0.4				1.1				
Intersection Summary												
HCM 2010 Ctrl Delay			42.7									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary
 28: Francisco W./Tamalpais & 2nd

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4T	T					T	T	T	T	
Traffic Volume (veh/h)	41	2224	57	0	0	0	0	43	240	93	173	0
Future Volume (veh/h)	41	2224	57	0	0	0	0	43	240	93	173	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.90				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1398	1398				0	1398	1454	1398	1398	0
Adj Flow Rate, veh/h	45	2417	33				0	47	246	101	188	0
Adj No. of Lanes	0	4	1				0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	44	2523	549				0	513	442	391	513	0
Arrive On Green	0.17	0.17	0.17				0.00	0.37	0.37	0.12	0.12	0.00
Sat Flow, veh/h	85	4915	1069				0	1398	1206	857	1398	0
Grp Volume(v), veh/h	734	1728	33				0	47	246	101	188	0
Grp Sat Flow(s),veh/h/ln	1394	1202	1069				0	1398	1206	857	1398	0
Q Serve(g_s), s	38.5	35.4	1.9				0.0	1.7	12.2	8.2	9.3	0.0
Cycle Q Clear(g_c), s	38.5	35.4	1.9				0.0	1.7	12.2	9.8	9.3	0.0
Prop In Lane	0.06		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	715	1852	549				0	513	442	391	513	0
V/C Ratio(X)	1.03	0.93	0.06				0.00	0.09	0.56	0.26	0.37	0.00
Avail Cap(c_a), veh/h	715	1852	549				0	513	442	391	513	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.1	29.9	16.0				0.0	15.6	18.9	25.9	25.0	0.0
Incr Delay (d2), s/veh	40.4	10.2	0.2				0.0	0.4	5.0	1.6	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.9	13.5	0.6				0.0	0.7	4.6	2.1	3.9	0.0
LnGrp Delay(d),s/veh	71.5	40.0	16.2				0.0	15.9	23.9	27.5	27.0	0.0
LnGrp LOS	F	D	B					B	C	C	C	
Approach Vol, veh/h		2495						293			289	
Approach Delay, s/veh		49.0						22.6			27.2	
Approach LOS		D						C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		43.0		32.0				32.0				
Change Period (Y+Rc), s		4.5		4.5				4.5				
Max Green Setting (Gmax), s		38.5		27.5				27.5				
Max Q Clear Time (g_c+I1), s		40.5		14.2				11.8				
Green Ext Time (p_c), s		0.0		1.1				1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			44.4									
HCM 2010 LOS			D									

HCM 2010 Signalized Intersection Summary
 29: 101 SBO n 2nd/Hetherton & 2nd/2nd St

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↑							↑	↑↑	
Traffic Volume (veh/h)	0	1112	1285	0	0	0	0	0	0	190	947	0
Future Volume (veh/h)	0	1112	1285	0	0	0	0	0	0	190	947	0
Number	5	2	12							3	8	18
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1485	1485							1485	1485	0
Adj Flow Rate, veh/h	0	1209	1371							207	1029	0
Adj No. of Lanes	0	3	2							1	2	0
Peak Hour Factor	0.92	0.92	0.92							0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3							3	3	0
Cap, veh/h	0	2288	1296							519	1089	0
Arrive On Green	0.00	0.17	0.17							0.12	0.12	0.00
Sat Flow, veh/h	0	4456	2525							1415	2971	0
Grp Volume(v), veh/h	0	1209	1371							207	1029	0
Grp Sat Flow(s),veh/h/ln	0	1485	1263							1415	1485	0
Q Serve(g_s), s	0.0	18.6	38.5							10.1	25.8	0.0
Cycle Q Clear(g_c), s	0.0	18.6	38.5							10.1	25.8	0.0
Prop In Lane	0.00		1.00							1.00		0.00
Lane Grp Cap(c), veh/h	0	2288	1296							519	1089	0
V/C Ratio(X)	0.00	0.53	1.06							0.40	0.94	0.00
Avail Cap(c_a), veh/h	0	2288	1296							519	1089	0
HCM Platoon Ratio	1.00	0.33	0.33							0.33	0.33	1.00
Upstream Filter(l)	0.00	1.00	1.00							1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	22.9	31.1							25.3	32.2	0.0
Incr Delay (d2), s/veh	0.0	0.9	41.8							2.3	16.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.8	21.0							4.3	13.2	0.0
LnGrp Delay(d),s/veh	0.0	23.7	72.9							27.6	49.0	0.0
LnGrp LOS		C	F							C	D	
Approach Vol, veh/h		2580									1236	
Approach Delay, s/veh		49.9									45.4	
Approach LOS		D									D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2						8				
Phs Duration (G+Y+Rc), s		43.0						32.0				
Change Period (Y+Rc), s		4.5						4.5				
Max Green Setting (Gmax), s		38.5						27.5				
Max Q Clear Time (g_c+1), s		40.5						27.8				
Green Ext Time (p_c), s		0.0						0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			48.4									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary
 30: Irwin & 2nd St

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗ ↘							↖ ↗ ↘				
Traffic Volume (veh/h)	678	794	0	0	0	0	0	1262	447	0	0	0
Future Volume (veh/h)	678	794	0	0	0	0	0	1262	447	0	0	0
Number	5	2	12				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1454	1485	0				0	1398	1398			
Adj Flow Rate, veh/h	737	863	0				0	1372	433			
Adj No. of Lanes	2	2	0				0	3	1			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0				0	3	3			
Cap, veh/h	1440	1339	0				0	1618	499			
Arrive On Green	0.15	0.15	0.00				0.00	0.42	0.42			
Sat Flow, veh/h	2769	2971	0				0	3943	1176			
Grp Volume(v), veh/h	737	863	0				0	1372	433			
Grp Sat Flow(s),veh/h/ln	1385	1485	0				0	1272	1176			
Q Serve(g_s), s	18.6	20.5	0.0				0.0	24.2	25.2			
Cycle Q Clear(g_c), s	18.6	20.5	0.0				0.0	24.2	25.2			
Prop In Lane	1.00		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	1440	1339	0				0	1618	499			
V/C Ratio(X)	0.51	0.64	0.00				0.00	0.85	0.87			
Avail Cap(c_a), veh/h	1440	1339	0				0	1618	499			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	25.5	26.3	0.0				0.0	19.4	19.7			
Incr Delay (d2), s/veh	1.3	2.4	0.0				0.0	5.7	18.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	7.4	8.9	0.0				0.0	9.2	10.6			
LnGrp Delay(d),s/veh	26.8	28.7	0.0				0.0	25.1	37.9			
LnGrp LOS	C	C						C	D			
Approach Vol, veh/h		1600						1805				
Approach Delay, s/veh		27.8						28.2				
Approach LOS		C						C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		38.0		37.0								
Change Period (Y+Rc), s		* 4.2		* 5.2								
Max Green Setting (Gmax), s		* 34		* 32								
Max Q Clear Time (g_c+I1), s		22.5		27.2								
Green Ext Time (p_c), s		9.0		4.2								
Intersection Summary												
HCM 2010 Ctrl Delay			28.0									
HCM 2010 LOS			C									
Notes												

HCM 2010 Signalized Intersection Summary
 31: Lindaro & Andersen




















10/01/2018



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (veh/h)	15	298	39	1	70	200	41	46	255	138	58	194	10
Future Volume (veh/h)	15	298	39	1	70	200	41	46	255	138	58	194	10
Number	5	2	12		1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0		0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94		1.00		0.97	1.00		0.97	1.00		0.91
Parking Bus, Adj	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 Sat Flow, veh/h/ln	2019	2019	2000		1942	1942	2000	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	16	324	37		76	217	36	50	277	126	63	211	9
Adj No. of Lanes	1	1	0		1	1	0	1	1	0	1	1	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
Percent Heavy Veh, %	3	3	3		3	3	3	3	3	3	3	3	3
Cap, veh/h	45	419	48		154	480	80	148	359	163	170	551	23
Arrive On Green	0.02	0.24	0.24		0.08	0.30	0.30	0.08	0.30	0.30	0.10	0.31	0.31
Sat Flow, veh/h	1923	1767	202		1849	1617	268	1757	1188	540	1757	1749	75
Grp Volume(v), veh/h	16	0	361		76	0	253	50	0	403	63	0	220
Grp Sat Flow(s),veh/h/ln	1923	0	1969		1849	0	1885	1757	0	1728	1757	0	1823
Q Serve(g_s), s	0.5	0.0	10.4		2.4	0.0	6.6	1.6	0.0	12.9	2.0	0.0	5.7
Cycle Q Clear(g_c), s	0.5	0.0	10.4		2.4	0.0	6.6	1.6	0.0	12.9	2.0	0.0	5.7
Prop In Lane	1.00		0.10		1.00		0.14	1.00		0.31	1.00		0.04
Lane Grp Cap(c), veh/h	45	0	466		154	0	559	148	0	523	170	0	574
V/C Ratio(X)	0.36	0.00	0.77		0.49	0.00	0.45	0.34	0.00	0.77	0.37	0.00	0.38
Avail Cap(c_a), veh/h	253	0	715		304	0	746	260	0	761	260	0	802
HCM Platoon Ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00		1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.3	0.0	21.7		26.7	0.0	17.4	26.3	0.0	19.3	25.8	0.0	16.3
Incr Delay (d2), s/veh	1.8	0.0	2.9		0.9	0.0	0.6	0.5	0.0	3.0	0.5	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	6.0		1.3	0.0	3.5	0.8	0.0	6.6	1.0	0.0	2.9
LnGrp Delay(d),s/veh	31.1	0.0	24.6		27.6	0.0	18.0	26.8	0.0	22.3	26.3	0.0	16.7
LnGrp LOS	C		C		C		B	C		C	C		B
Approach Vol, veh/h		377				329			453			283	
Approach Delay, s/veh		24.9				20.2			22.8			18.8	
Approach LOS		C				C			C			B	
Timer	1	2	3	4	5	6	7	8					
Assigned Phs	1	2	3	4	5	6	7	8					
Phs Duration (G+Y+Rc), s	9.1	19.3	9.1	23.4	5.4	23.0	9.9	22.6					
Change Period (Y+Rc), s	4.0	4.9	4.0	* 4.2	4.0	4.9	4.0	* 4.2					
Max Green Setting (Gmax), s	10.0	22.1	9.0	* 27	8.0	24.1	9.0	* 27					
Max Q Clear Time (g_c+1), s	14.5	12.4	3.6	7.7	2.5	8.6	4.0	14.9					
Green Ext Time (p_c), s	0.0	1.1	0.0	0.8	0.0	0.8	0.0	1.4					
Intersection Summary													
HCM 2010 Ctrl Delay			22.0										
HCM 2010 LOS			C										
Notes													

HCM 2010 Signalized Intersection Summary
1: Lincoln & Mission

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	246	420	12	40	496	62	8	454	42	0	348	288
Future Volume (veh/h)	246	420	12	40	496	62	8	454	42	0	348	288
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.93	1.00		0.95
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1676	1676	1710	1676	1676	1710	1800	1694	1728	0	1765	1728
Adj Flow Rate, veh/h	256	438	11	42	517	59	8	473	36	0	362	104
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	0	2	2
Cap, veh/h	180	956	24	476	645	74	52	1136	85	0	987	279
Arrive On Green	0.11	0.59	0.59	0.87	0.87	0.87	0.77	0.77	0.77	0.00	0.39	0.39
Sat Flow, veh/h	1597	1627	41	887	1474	168	14	2932	220	0	2636	719
Grp Volume(v), veh/h	256	0	449	42	0	576	274	0	243	0	236	230
Grp Sat Flow(s),veh/h/ln	1597	0	1668	887	0	1642	1681	0	1485	0	1676	1590
Q Serve(g_s), s	9.0	0.0	12.2	0.5	0.0	11.8	0.0	0.0	4.4	0.0	8.0	8.3
Cycle Q Clear(g_c), s	9.0	0.0	12.2	0.7	0.0	11.8	4.3	0.0	4.4	0.0	8.0	8.3
Prop In Lane	1.00		0.02	1.00		0.10	0.03		0.15	0.00		0.45
Lane Grp Cap(c), veh/h	180	0	980	476	0	718	698	0	575	0	650	616
V/C Ratio(X)	1.43	0.00	0.46	0.09	0.00	0.80	0.39	0.00	0.42	0.00	0.36	0.37
Avail Cap(c_a), veh/h	180	0	980	476	0	718	698	0	575	0	650	616
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.84	0.00	0.84	0.87	0.00	0.87	0.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	0.0	9.3	2.9	0.0	3.5	6.0	0.0	6.0	0.0	17.5	17.5
Incr Delay (d2), s/veh	220.5	0.0	1.5	0.3	0.0	7.8	1.4	0.0	2.0	0.0	1.6	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.9	0.0	5.9	0.2	0.0	6.0	2.1	0.0	2.1	0.0	4.0	3.9
LnGrp Delay(d),s/veh	256.0	0.0	10.9	3.2	0.0	11.4	7.4	0.0	8.0	0.0	19.0	19.3
LnGrp LOS	F		B	A		B	A		A		B	B
Approach Vol, veh/h		705			618			517			466	
Approach Delay, s/veh		99.9			10.8			7.7			19.2	
Approach LOS		F			B			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		51.2		35.8	12.0	39.2		35.8				
Change Period (Y+Rc), s		* 4.2		4.6	3.0	* 4.2		4.6				
Max Green Setting (Gmax), s		* 47		24.4	9.0	* 35		24.4				
Max Q Clear Time (g_c+I1), s		14.2		6.4	11.0	13.8		10.3				
Green Ext Time (p_c), s		4.7		4.3	0.0	6.2		3.4				
Intersection Summary												
HCM 2010 Ctrl Delay			39.0									
HCM 2010 LOS			D									
Notes												

HCM Signalized Intersection Capacity Analysis

2: Hetherton/101 SB Off Hetherton & Mission

Existing Conditions
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑						↑↑	↑
Traffic Volume (vph)	0	445	37	31	157	0	0	0	0	224	1100	425
Future Volume (vph)	0	445	37	31	157	0	0	0	0	224	1100	425
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	10	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		0.95			1.00						0.95	1.00
Frbp, ped/bikes		1.00			1.00						1.00	0.98
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.99			1.00						1.00	0.85
Flt Protected		1.00			0.99						0.99	1.00
Satd. Flow (prot)		2777			1783						2992	1321
Flt Permitted		1.00			0.88						0.99	1.00
Satd. Flow (perm)		2777			1589						2992	1321
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	464	39	32	164	0	0	0	0	233	1146	443
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	495	0	0	196	0	0	0	0	0	1379	443
Confl. Peds. (#/hr)			15	15		4			11			
Confl. Bikes (#/hr)			3			3			3			2
Turn Type		NA		Perm	NA					Split	NA	custom
Protected Phases		4			8					2	2	
Permitted Phases				8								5
Actuated Green, G (s)		30.8			30.8						40.4	33.4
Effective Green, g (s)		30.8			30.8						40.4	33.4
Actuated g/C Ratio		0.39			0.39						0.50	0.42
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		1069			611						1510	551
v/s Ratio Prot		c0.18									c0.46	
v/s Ratio Perm					0.12							0.34
v/c Ratio		0.46			0.32						0.91	0.80
Uniform Delay, d1		18.4			17.3						18.2	20.4
Progression Factor		0.27			0.34						1.00	1.00
Incremental Delay, d2		1.3			1.2						10.0	11.8
Delay (s)		6.3			7.1						28.2	32.2
Level of Service		A			A						C	C
Approach Delay (s)		6.3			7.1			0.0			29.2	
Approach LOS		A			A			A			C	

Intersection Summary

HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

3: Irwin & Mission & 101 NBoN Mission



















Existing Conditions
Timing Plan: PM Peak Hour



Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2	
Lane Configurations											
Traffic Volume (vph)	360	18	291	123	288	13	58	1409	178	42	
Future Volume (vph)	360	18	291	123	288	13	58	1409	178	42	
Ideal Flow (vphpl)	2200	1800	2200	2200	2200	1800	2200	2200	1800	2200	
Lane Width	9	12	10	10	9	12	12	12	12	12	
Total Lost time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Lane Util. Factor		1.00	1.00	1.00	1.00			0.95	1.00		
Frbp, ped/bikes		1.00	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		
Frt		1.00	1.00	1.00	0.85			1.00	0.85		
Flt Protected		0.95	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (prot)		1509	1812	1812	1485			3679	1316		
Flt Permitted		0.65	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (perm)		1039	1812	1812	1485			3679	1316		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	375	19	303	128	300	14	60	1468	185	44	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	38	0	
Lane Group Flow (vph)	0	394	303	128	314	0	0	1528	191	0	
Confl. Peds. (#/hr)							8			3	
Confl. Bikes (#/hr)					4	4					
Turn Type	pm+pt	pm+pt	NA	NA	Prot		Perm	NA	Perm		
Protected Phases	5	5	2	6	6			4			
Permitted Phases	2	2					4			4	
Actuated Green, G (s)		32.8	32.8	16.8	16.8			38.8	38.8		
Effective Green, g (s)		32.8	32.8	16.8	16.8			38.8	38.8		
Actuated g/C Ratio		0.41	0.41	0.21	0.21			0.48	0.48		
Clearance Time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Lane Grp Cap (vph)		495	742	380	311			1784	638		
v/s Ratio Prot		c0.12	0.17	0.07	c0.21						
v/s Ratio Perm		0.21						0.42	0.15		
v/c Ratio		0.80	0.41	0.34	1.01			0.86	0.30		
Uniform Delay, d1		20.9	16.7	26.9	31.6			18.1	12.4		
Progression Factor		0.72	0.76	1.00	1.00			0.47	0.24		
Incremental Delay, d2		10.1	1.3	2.4	53.5			3.8	0.8		
Delay (s)		25.1	14.0	29.3	85.1			12.3	3.7		
Level of Service		C	B	C	F			B	A		
Approach Delay (s)			20.3	68.9				11.2			
Approach LOS			C	E				B			
Intersection Summary											
HCM 2000 Control Delay			22.2							HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.90								
Actuated Cycle Length (s)			80.0							Sum of lost time (s)	12.6
Intersection Capacity Utilization			93.1%							ICU Level of Service	F
Analysis Period (min)			15								
c Critical Lane Group											

HCM 2010 Signalized Intersection Summary
4: Lincoln & 5th

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	355	35	25	235	40	30	389	44	52	316	32
Future Volume (veh/h)	74	355	35	25	235	40	30	389	44	52	316	32
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	1.00		0.98	0.97		0.92	0.98		0.92
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1412	1560	1530	1412	1500	1530	1440	1500	1469	1440	1500	1469
Adj Flow Rate, veh/h	77	370	32	26	245	34	31	405	36	54	329	25
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	529	713	62	347	649	90	90	918	80	155	822	62
Arrive On Green	0.50	0.50	0.50	1.00	1.00	1.00	0.76	0.76	0.76	0.76	0.76	0.76
Sat Flow, veh/h	870	1413	122	782	1285	178	103	2415	210	258	2163	164
Grp Volume(v), veh/h	77	0	402	26	0	279	247	0	225	207	0	201
Grp Sat Flow(s),veh/h/ln	870	0	1535	782	0	1463	1421	0	1307	1265	0	1320
Q Serve(g_s), s	3.8	0.0	14.1	1.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	4.2
Cycle Q Clear(g_c), s	3.8	0.0	14.1	15.0	0.0	0.0	4.7	0.0	5.0	3.7	0.0	4.2
Prop In Lane	1.00		0.08	1.00		0.12	0.13		0.16	0.26		0.12
Lane Grp Cap(c), veh/h	529	0	775	347	0	739	591	0	497	537	0	502
V/C Ratio(X)	0.15	0.00	0.52	0.07	0.00	0.38	0.42	0.00	0.45	0.38	0.00	0.40
Avail Cap(c_a), veh/h	529	0	775	347	0	739	591	0	497	537	0	502
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.98	0.00	0.98	0.88	0.00	0.88	0.77	0.00	0.77
Uniform Delay (d), s/veh	10.8	0.0	13.3	2.6	0.0	0.0	6.5	0.0	6.6	6.4	0.0	6.5
Incr Delay (d2), s/veh	0.6	0.0	2.5	0.4	0.0	1.4	1.9	0.0	2.6	1.6	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	6.5	0.2	0.0	0.3	2.1	0.0	2.1	1.6	0.0	1.7
LnGrp Delay(d),s/veh	11.3	0.0	15.8	3.0	0.0	1.4	8.4	0.0	9.2	8.0	0.0	8.3
LnGrp LOS	B		B	A		A	A		A	A		A
Approach Vol, veh/h		479			305			472			408	
Approach Delay, s/veh		15.0			1.6			8.8			8.1	
Approach LOS		B			A			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		45.0		35.0		45.0		35.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		40.4		30.4		40.4		30.4				
Max Q Clear Time (g_c+I1), s		16.1		7.0		17.0		6.2				
Green Ext Time (p_c), s		2.3		2.0		1.3		1.8				
Intersection Summary												
HCM 2010 Ctrl Delay			9.1									
HCM 2010 LOS			A									

HCM Signalized Intersection Capacity Analysis

5: Hetherton & 5th



















Existing Conditions
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔					↔↔↔	↔↔↔	↔
Traffic Volume (vph)	0	307	167	56	160	0	0	0	0	45	1003	120
Future Volume (vph)	0	307	167	56	160	0	0	0	0	45	1003	120
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		1.00			1.00						0.91	1.00
Frbp, ped/bikes		0.99			1.00						1.00	0.96
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.95			1.00						1.00	0.85
Flt Protected		1.00			0.99						1.00	1.00
Satd. Flow (prot)		1698			1775						4164	1148
Flt Permitted		1.00			0.74						1.00	1.00
Satd. Flow (perm)		1698			1323						4164	1148
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	320	174	58	167	0	0	0	0	47	1045	125
RTOR Reduction (vph)	0	24	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	470	0	0	225	0	0	0	0	0	1092	125
Confl. Peds. (#/hr)	12		12	12		12			12	12		7
Confl. Bikes (#/hr)			6			4			2			2
Parking (#/hr)											2	2
Turn Type		NA		Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases				8						2		5
Actuated Green, G (s)		35.8			35.8						35.4	28.4
Effective Green, g (s)		35.8			35.8						35.4	28.4
Actuated g/C Ratio		0.45			0.45						0.44	0.35
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		759			592						1842	407
v/s Ratio Prot		c0.28										
v/s Ratio Perm					0.17						0.26	0.11
v/c Ratio		0.62			0.38						0.59	0.31
Uniform Delay, d1		16.9			14.7						16.9	18.7
Progression Factor		0.28			1.05						0.32	0.40
Incremental Delay, d2		3.6			1.6						0.6	0.9
Delay (s)		8.4			17.0						6.0	8.3
Level of Service		A			B						A	A
Approach Delay (s)		8.4			17.0			0.0			6.3	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			8.1								A	
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			80.0							10.8		
Intersection Capacity Utilization			87.3%								E	
Analysis Period (min)			15									
c Critical Lane Group												




















HCM 2010 Signalized Intersection Summary
6: Irwin & 5th

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	232	140	0	0	120	103	86	1338	14	0	0	0
Future Volume (veh/h)	232	140	0	0	120	103	86	1338	14	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.97	1.00		0.96			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1588	1588	0	0	1588	1620	1620	1588	1620			
Adj Flow Rate, veh/h	242	146	0	0	125	95	90	1394	14			
Adj No. of Lanes	1	1	0	0	1	0	0	3	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	2	0	2	0			
Cap, veh/h	379	643	0	0	291	221	125	2061	21			
Arrive On Green	0.68	0.68	0.00	0.00	0.41	0.41	0.16	0.16	0.16			
Sat Flow, veh/h	1035	1588	0	0	718	545	260	4295	44			
Grp Volume(v), veh/h	242	146	0	0	0	220	545	455	497			
Grp Sat Flow(s),veh/h/ln	1035	1588	0	0	0	1263	1575	1445	1578			
Q Serve(g_s), s	16.4	2.8	0.0	0.0	0.0	10.0	26.3	23.7	23.7			
Cycle Q Clear(g_c), s	26.4	2.8	0.0	0.0	0.0	10.0	26.3	23.7	23.7			
Prop In Lane	1.00		0.00	0.00		0.43	0.17		0.03			
Lane Grp Cap(c), veh/h	379	643	0	0	0	512	756	694	758			
V/C Ratio(X)	0.64	0.23	0.00	0.00	0.00	0.43	0.72	0.66	0.66			
Avail Cap(c_a), veh/h	379	643	0	0	0	512	756	694	758			
HCM Platoon Ratio	1.67	1.67	1.00	1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	16.4	8.2	0.0	0.0	0.0	17.1	28.6	27.5	27.5			
Incr Delay (d2), s/veh	8.0	0.8	0.0	0.0	0.0	2.6	5.9	4.8	4.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.4	1.4	0.0	0.0	0.0	3.9	12.7	10.4	11.3			
LnGrp Delay(d),s/veh	24.3	9.0	0.0	0.0	0.0	19.8	34.5	32.3	31.9			
LnGrp LOS	C	A				B	C	C	C			
Approach Vol, veh/h		388			220			1498				
Approach Delay, s/veh		18.6			19.8			32.9				
Approach LOS		B			B			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		37.0		43.0		37.0						
Change Period (Y+Rc), s		4.6		4.6		4.6						
Max Green Setting (Gmax), s		32.4		38.4		32.4						
Max Q Clear Time (g_c+I1), s		28.4		28.3		12.0						
Green Ext Time (p_c), s		0.8		5.1		0.9						
Intersection Summary												
HCM 2010 Ctrl Delay			28.9									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary
7: Lincoln & 4th

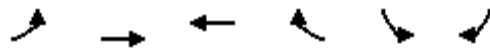
Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	216	31	90	238	65	27	366	78	43	271	62
Future Volume (veh/h)	45	216	31	90	238	65	27	366	78	43	271	62
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.91	0.97		0.91	0.92		0.83	0.95		0.83
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1588	1525	1620	1588	1588	1620	1620	1588	1555	1620	1588	1555
Adj Flow Rate, veh/h	47	225	26	94	248	56	28	381	60	45	282	43
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	403	676	78	490	626	141	85	907	138	128	735	118
Arrive On Green	0.51	0.51	0.51	0.17	0.17	0.17	0.13	0.13	0.13	0.77	0.77	0.77
Sat Flow, veh/h	948	1326	153	977	1228	277	91	2356	358	188	1909	305
Grp Volume(v), veh/h	47	0	251	94	0	304	252	0	217	184	0	186
Grp Sat Flow(s),veh/h/ln	948	0	1479	977	0	1505	1512	0	1293	1084	0	1318
Q Serve(g_s), s	2.8	0.0	8.0	6.9	0.0	14.4	0.0	0.0	12.4	2.5	0.0	3.6
Cycle Q Clear(g_c), s	17.2	0.0	8.0	14.9	0.0	14.4	11.7	0.0	12.4	14.9	0.0	3.6
Prop In Lane	1.00		0.10	1.00		0.18	0.11		0.28	0.24		0.23
Lane Grp Cap(c), veh/h	403	0	754	490	0	768	632	0	498	473	0	507
V/C Ratio(X)	0.12	0.00	0.33	0.19	0.00	0.40	0.40	0.00	0.44	0.39	0.00	0.37
Avail Cap(c_a), veh/h	403	0	754	490	0	768	632	0	498	473	0	507
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.94	0.00	0.94	0.91	0.00	0.91	0.89	0.00	0.89
Uniform Delay (d), s/veh	18.9	0.0	11.6	26.1	0.0	22.3	26.6	0.0	26.9	6.7	0.0	6.1
Incr Delay (d2), s/veh	0.6	0.0	1.2	0.8	0.0	1.4	1.7	0.0	2.5	2.1	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	3.5	2.0	0.0	6.3	5.4	0.0	4.8	1.4	0.0	1.5
LnGrp Delay(d),s/veh	19.5	0.0	12.8	26.9	0.0	23.7	28.3	0.0	29.4	8.8	0.0	7.9
LnGrp LOS	B		B	C		C	C		C	A		A
Approach Vol, veh/h		298			398			469			370	
Approach Delay, s/veh		13.8			24.5			28.8			8.3	
Approach LOS		B			C			C			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		45.0		35.0		45.0		35.0				
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2		* 4.2				
Max Green Setting (Gmax), s		* 41		* 31		* 41		* 31				
Max Q Clear Time (g_c+I1), s		19.2		14.4		16.9		16.9				
Green Ext Time (p_c), s		2.6		3.8		3.9		2.7				
Intersection Summary												
HCM 2010 Ctrl Delay				19.8								
HCM 2010 LOS				B								
Notes												

HCM Signalized Intersection Capacity Analysis

8: 4th & Tamalpais

Existing Conditions
Timing Plan: PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↔			↗
Traffic Volume (vph)	0	348	363	45	0	40
Future Volume (vph)	0	348	363	45	0	40
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0	6.0			5.6
Lane Util. Factor		1.00	1.00			1.00
Frbp, ped/bikes		1.00	0.98			0.78
Flpb, ped/bikes		1.00	1.00			1.00
Frt		1.00	0.99			0.86
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		1588	1533			1074
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		1588	1533			1074
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	362	378	47	0	42
RTOR Reduction (vph)	0	0	5	0	0	36
Lane Group Flow (vph)	0	363	420	0	0	6
Confl. Peds. (#/hr)				59		78
Confl. Bikes (#/hr)				14		
Turn Type		NA	NA			Perm
Protected Phases		2 8	4 6			
Permitted Phases						8
Actuated Green, G (s)		55.4	56.1			12.3
Effective Green, g (s)		55.4	56.1			12.3
Actuated g/C Ratio		0.69	0.70			0.15
Clearance Time (s)						5.6
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)		1099	1075			165
v/s Ratio Prot		c0.23	c0.27			
v/s Ratio Perm						0.01
v/c Ratio		0.33	0.39			0.04
Uniform Delay, d1		4.9	4.9			28.8
Progression Factor		0.92	0.13			1.00
Incremental Delay, d2		0.2	0.2			0.1
Delay (s)		4.7	0.8			28.9
Level of Service		A	A			C
Approach Delay (s)		4.7	0.8		28.9	
Approach LOS		A	A		C	
Intersection Summary						
HCM 2000 Control Delay			3.9		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.43			
Actuated Cycle Length (s)			80.0		Sum of lost time (s)	17.6
Intersection Capacity Utilization			48.3%		ICU Level of Service	A
Analysis Period (min)			15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

9: Hetherton & 4th

Existing Conditions
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↖	↑						↑↑↑	↗
Traffic Volume (vph)	0	247	104	71	224	0	0	0	0	118	913	195
Future Volume (vph)	0	247	104	71	224	0	0	0	0	118	913	195
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	13	10	15	11	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Lane Util. Factor		1.00	1.00	1.00	1.00						0.91	1.00
Frbp, ped/bikes		1.00	0.93	1.00	1.00						1.00	0.92
Flpb, ped/bikes		1.00	1.00	0.97	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						0.99	1.00
Satd. Flow (prot)		1641	1173	1602	1535						4143	1102
Flt Permitted		1.00	1.00	0.54	1.00						0.99	1.00
Satd. Flow (perm)		1641	1173	915	1535						4143	1102
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	257	108	74	233	0	0	0	0	123	951	203
RTOR Reduction (vph)	0	0	34	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	257	74	74	233	0	0	0	0	0	1074	203
Confl. Peds. (#/hr)			51	51		28			11	11		19
Confl. Bikes (#/hr)			10			16			1			1
Parking (#/hr)											2	2
Turn Type		NA	Perm	Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases			4	8						2		5
Actuated Green, G (s)		34.8	34.8	34.8	34.8						36.4	29.4
Effective Green, g (s)		34.8	34.8	34.8	34.8						36.4	29.4
Actuated g/C Ratio		0.43	0.43	0.43	0.43						0.45	0.37
Clearance Time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		713	510	398	667						1885	404
v/s Ratio Prot		c0.16			0.15							
v/s Ratio Perm			0.06	0.08							0.26	0.18
v/c Ratio		0.36	0.15	0.19	0.35						0.57	0.50
Uniform Delay, d1		15.1	13.6	13.9	15.1						16.0	19.6
Progression Factor		0.53	0.37	0.88	0.92						0.38	0.47
Incremental Delay, d2		1.4	0.6	1.0	1.3						1.0	3.6
Delay (s)		9.5	5.6	13.2	15.2						7.1	12.9
Level of Service		A	A	B	B						A	B
Approach Delay (s)		8.3			14.7			0.0			8.0	
Approach LOS		A			B			A			A	



















Intersection Summary

HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group















HCM 2010 Signalized Intersection Summary
10: Irwin & 4th

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	154	203	0	0	182	79	111	1210	153	0	0	0
Future Volume (veh/h)	154	203	0	0	182	79	111	1210	153	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.95	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1588	1588	0	0	1588	1620	1525	1588	1620			
Adj Flow Rate, veh/h	160	211	0	0	190	61	116	1260	138			
Adj No. of Lanes	1	1	0	0	1	0	1	3	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	256	552	0	0	343	110	795	2170	238			
Arrive On Green	0.11	0.11	0.00	0.00	0.11	0.11	0.18	0.18	0.18			
Sat Flow, veh/h	1005	1588	0	0	988	317	1452	3963	434			
Grp Volume(v), veh/h	160	211	0	0	0	251	116	919	479			
Grp Sat Flow(s),veh/h/ln	1005	1588	0	0	0	1305	1452	1445	1506			
Q Serve(g_s), s	12.7	9.8	0.0	0.0	0.0	14.5	5.4	23.3	23.3			
Cycle Q Clear(g_c), s	27.3	9.8	0.0	0.0	0.0	14.5	5.4	23.3	23.3			
Prop In Lane	1.00		0.00	0.00		0.24	1.00		0.29			
Lane Grp Cap(c), veh/h	256	552	0	0	0	453	795	1583	825			
V/C Ratio(X)	0.62	0.38	0.00	0.00	0.00	0.55	0.15	0.58	0.58			
Avail Cap(c_a), veh/h	256	552	0	0	0	453	795	1583	825			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	0.33	0.33	0.33	0.33	0.33			
Upstream Filter(I)	0.94	0.94	0.00	0.00	0.00	1.00	0.43	0.43	0.43			
Uniform Delay (d), s/veh	42.4	27.5	0.0	0.0	0.0	29.5	17.0	24.4	24.4			
Incr Delay (d2), s/veh	10.3	1.9	0.0	0.0	0.0	4.8	0.2	0.7	1.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.3	4.6	0.0	0.0	0.0	5.9	2.2	9.5	10.0			
LnGrp Delay(d),s/veh	52.8	29.3	0.0	0.0	0.0	34.4	17.2	25.0	25.7			
LnGrp LOS	D	C				C	B	C	C			
Approach Vol, veh/h		371			251			1514				
Approach Delay, s/veh		39.4			34.4			24.6				
Approach LOS		D			C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		32.0		48.0		32.0						
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2						
Max Green Setting (Gmax), s		* 28		* 44		* 28						
Max Q Clear Time (g_c+I1), s		29.3		25.3		16.5						
Green Ext Time (p_c), s		0.0		7.6		0.8						
Intersection Summary												
HCM 2010 Ctrl Delay				28.4								
HCM 2010 LOS				C								
Notes												













HCM 2010 Signalized Intersection Summary
 11: D & 3rd

Existing Conditions
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	291	1425	0	0	0	0	0	269	47
Future Volume (veh/h)	0	0	0	291	1425	0	0	0	0	0	269	47
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.95
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.82
Adj Sat Flow, veh/h/ln				1530	1500	0				0	1500	1530
Adj Flow Rate, veh/h				303	1484	0				0	280	30
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				459	1989	0				0	630	67
Arrive On Green				0.21	0.21	0.00				0.00	0.27	0.27
Sat Flow, veh/h				632	3318	0				0	2430	249
Grp Volume(v), veh/h				644	1143	0				0	168	142
Grp Sat Flow(s),veh/h/ln				1342	1242	0				0	1425	1179
Q Serve(g_s), s				36.2	34.5	0.0				0.0	7.8	8.0
Cycle Q Clear(g_c), s				36.2	34.5	0.0				0.0	7.8	8.0
Prop In Lane				0.47		0.00				0.00		0.21
Lane Grp Cap(c), veh/h				902	1546	0				0	381	315
V/C Ratio(X)				0.71	0.74	0.00				0.00	0.44	0.45
Avail Cap(c_a), veh/h				902	1546	0				0	381	315
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				26.4	25.7	0.0				0.0	24.3	24.4
Incr Delay (d2), s/veh				4.8	3.2	0.0				0.0	3.7	4.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				14.7	12.6	0.0				0.0	3.5	3.0
LnGrp Delay(d),s/veh				31.2	28.9	0.0				0.0	28.0	29.0
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1787						310	
Approach Delay, s/veh					29.7						28.5	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		54.0		26.0								
Change Period (Y+Rc), s		* 4.2		4.6								
Max Green Setting (Gmax), s		* 50		21.4								
Max Q Clear Time (g_c+I1), s		38.2		10.0								
Green Ext Time (p_c), s		7.0		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay				29.5								
HCM 2010 LOS				C								
Notes												















HCM 2010 Signalized Intersection Summary
12: C & 3rd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑		↑↑				
Traffic Volume (veh/h)	0	0	0	0	1597	141	128	298	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1597	141	128	298	0	0	0	0
Number				5	2	12	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.98	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1412	1412	1440	1412	0			
Adj Flow Rate, veh/h				0	1664	111	133	310	0			
Adj No. of Lanes				0	3	1	0	2	0			
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %				0	2	2	2	2	0			
Cap, veh/h				0	2351	717	255	519	0			
Arrive On Green				0.00	0.20	0.20	0.09	0.09	0.00			
Sat Flow, veh/h				0	3981	1175	649	1885	0			
Grp Volume(v), veh/h				0	1664	111	239	204	0			
Grp Sat Flow(s),veh/h/ln				0	1285	1175	1250	1220	0			
Q Serve(g_s), s				0.0	32.2	6.2	13.4	12.8	0.0			
Cycle Q Clear(g_c), s				0.0	32.2	6.2	14.7	12.8	0.0			
Prop In Lane				0.00		1.00	0.56		0.00			
Lane Grp Cap(c), veh/h				0	2351	717	426	348	0			
V/C Ratio(X)				0.00	0.71	0.15	0.56	0.59	0.00			
Avail Cap(c_a), veh/h				0	2351	717	426	348	0			
HCM Platoon Ratio				1.00	0.33	0.33	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	25.3	14.9	32.5	31.7	0.0			
Incr Delay (d2), s/veh				0.0	1.8	0.5	5.3	7.1	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	11.9	2.1	5.7	5.0	0.0			
LnGrp Delay(d),s/veh				0.0	27.1	15.4	37.8	38.8	0.0			
LnGrp LOS					C	B	D	D				
Approach Vol, veh/h					1775			443				
Approach Delay, s/veh					26.4			38.2				
Approach LOS					C			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		53.0		27.0								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 49		* 23								
Max Q Clear Time (g_c+I1), s		34.2		16.7								
Green Ext Time (p_c), s		8.5		1.0								
Intersection Summary												
HCM 2010 Ctrl Delay				28.8								
HCM 2010 LOS				C								
Notes												

















HCM 2010 Signalized Intersection Summary
13: B & 3rd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	169	1659	0	0	0	0	0	263	84
Future Volume (veh/h)	0	0	0	169	1659	0	0	0	0	0	263	84
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.86
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1440	1412	0				0	1412	1440
Adj Flow Rate, veh/h				176	1728	0				0	274	69
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				256	2131	0				0	507	123
Arrive On Green				0.21	0.21	0.00				0.00	0.26	0.26
Sat Flow, veh/h				315	3472	0				0	2021	471
Grp Volume(v), veh/h				701	1203	0				0	185	158
Grp Sat Flow(s),veh/h/ln				1333	1169	0				0	1341	1081
Q Serve(g_s), s				37.3	39.2	0.0				0.0	9.5	10.1
Cycle Q Clear(g_c), s				40.2	39.2	0.0				0.0	9.5	10.1
Prop In Lane				0.25		0.00				0.00		0.44
Lane Grp Cap(c), veh/h				903	1485	0				0	349	281
V/C Ratio(X)				0.78	0.81	0.00				0.00	0.53	0.56
Avail Cap(c_a), veh/h				903	1485	0				0	349	281
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				27.3	27.0	0.0				0.0	25.4	25.7
Incr Delay (d2), s/veh				6.5	4.9	0.0				0.0	5.7	7.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				16.5	13.7	0.0				0.0	4.0	3.7
LnGrp Delay(d),s/veh				33.8	31.9	0.0				0.0	31.1	33.6
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1904						343	
Approach Delay, s/veh					32.6						32.2	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		55.0		25.0								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 51		* 21								
Max Q Clear Time (g_c+I1), s		42.2		12.1								
Green Ext Time (p_c), s		5.9		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay				32.6								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary
 14: A & 3rd

Existing Conditions
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	65	1523	83	220	146	0	0	160	45
Future Volume (veh/h)	0	0	0	65	1523	83	220	146	0	0	160	45
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.91	0.96		1.00	1.00		0.92
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1800	1765	1800	1853	1853	0	0	1853	1890
Adj Flow Rate, veh/h				68	1586	79	229	152	0	0	167	35
Adj No. of Lanes				0	3	0	1	1	0	0	1	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				102	2519	130	310	649	0	0	301	63
Arrive On Green				0.18	0.18	0.18	0.10	0.58	0.00	0.00	0.23	0.23
Sat Flow, veh/h				187	4632	238	1765	1853	0	0	1300	273
Grp Volume(v), veh/h				639	532	562	229	152	0	0	0	202
Grp Sat Flow(s),veh/h/ln				1755	1606	1696	1765	1853	0	0	0	1573
Q Serve(g_s), s				27.2	24.4	24.4	0.3	3.2	0.0	0.0	0.0	9.1
Cycle Q Clear(g_c), s				27.2	24.4	24.4	0.3	3.2	0.0	0.0	0.0	9.1
Prop In Lane				0.11		0.14	1.00		0.00	0.00		0.17
Lane Grp Cap(c), veh/h				954	873	922	310	649	0	0	0	364
V/C Ratio(X)				0.67	0.61	0.61	0.74	0.23	0.00	0.00	0.00	0.56
Avail Cap(c_a), veh/h				954	873	922	310	649	0	0	0	364
HCM Platoon Ratio				0.33	0.33	0.33	1.67	1.67	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				26.1	25.0	25.0	31.8	11.5	0.0	0.0	0.0	27.1
Incr Delay (d2), s/veh				3.7	3.2	3.0	14.6	0.8	0.0	0.0	0.0	6.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				14.2	11.6	12.2	5.8	1.8	0.0	0.0	0.0	4.5
LnGrp Delay(d),s/veh				29.8	28.1	28.0	46.4	12.3	0.0	0.0	0.0	33.1
LnGrp LOS				C	C	C	D	B				C
Approach Vol, veh/h					1733			381			202	
Approach Delay, s/veh					28.7			32.8			33.1	
Approach LOS					C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			9.0	23.0		48.0		32.0				
Change Period (Y+Rc), s			4.0	4.5		4.5		4.0				
Max Green Setting (Gmax), s			5.0	18.5		43.5		28.0				
Max Q Clear Time (g_c+I1), s			2.3	11.1		29.2		5.2				
Green Ext Time (p_c), s			0.4	0.8		11.5		1.1				
Intersection Summary												
HCM 2010 Ctrl Delay				29.8								
HCM 2010 LOS				C								

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

BioMarin
Existing Conditions
PM Peak Hour

Intersection 15 Brooks St/3rd St Side-street Stop


















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	35	29	83.1%	9.0	2.1	A
	Through						
	Right Turn						
	Subtotal	35	29	83.1%	9.0	2.1	A
SB	Left Turn						
	Through	4	4	92.0%	15.2	19.7	C
	Right Turn	3	3	85.9%	6.9	13.5	A
	Subtotal	7	6	89.4%	13.9	18.1	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	60	49	81.6%	2.0	0.3	A
	Through	1,640	1,571	95.8%	1.4	0.3	A
	Right Turn	4	4	92.0%	0.6	0.7	A
	Subtotal	1,704	1,624	95.3%	1.4	0.3	A
Total		1,746	1,659	95.0%	1.6	0.3	A

Intersection 16 Lindero St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	99	95	96.3%	25.1	3.1	C
	Through	18	18	98.1%	24.2	5.2	C
	Right Turn						
	Subtotal	117	113	96.6%	24.9	2.4	C
SB	Left Turn						
	Through	39	36	91.5%	19.5	6.2	B
	Right Turn	8	7	87.4%	15.2	9.7	B
	Subtotal	47	43	90.8%	18.6	5.5	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	200	193	96.4%	10.5	2.1	B
	Through	1,681	1,588	94.5%	8.5	1.8	A
	Right Turn	35	38	109.3%	7.2	2.1	A
	Subtotal	1,916	1,819	95.0%	8.7	1.8	A
Total		2,080	1,975	95.0%	9.8	1.7	A
















HCM 2010 Signalized Intersection Summary
 16: Lindaro & 3rd

Existing Conditions
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	199	1681	35	98	18	0	0	39	8
Future Volume (veh/h)	0	0	0	199	1681	35	98	18	0	0	39	8
Number				1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1412	1412	1440	1440	1412	0	0	1412	1440
Adj Flow Rate, veh/h				207	1751	33	102	19	0	0	41	2
Adj No. of Lanes				1	3	0	0	1	0	0	1	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				820	2372	45	332	53	0	0	381	19
Arrive On Green				0.20	0.20	0.20	0.28	0.28	0.00	0.00	0.28	0.28
Sat Flow, veh/h				1345	3889	73	875	186	0	0	1335	65
Grp Volume(v), veh/h				207	1157	627	121	0	0	0	0	43
Grp Sat Flow(s),veh/h/ln				1345	1285	1393	1061	0	0	0	0	1400
Q Serve(g_s), s				10.4	33.8	33.8	6.6	0.0	0.0	0.0	0.0	1.8
Cycle Q Clear(g_c), s				10.4	33.8	33.8	8.4	0.0	0.0	0.0	0.0	1.8
Prop In Lane				1.00		0.05	0.84		0.00	0.00		0.05
Lane Grp Cap(c), veh/h				820	1567	850	385	0	0	0	0	399
V/C Ratio(X)				0.25	0.74	0.74	0.31	0.00	0.00	0.00	0.00	0.11
Avail Cap(c_a), veh/h				820	1567	850	385	0	0	0	0	399
HCM Platoon Ratio				0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				16.6	26.0	26.0	23.9	0.0	0.0	0.0	0.0	21.1
Incr Delay (d2), s/veh				0.7	3.1	5.7	2.1	0.0	0.0	0.0	0.0	0.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				4.0	12.7	14.4	2.4	0.0	0.0	0.0	0.0	0.8
LnGrp Delay(d),s/veh				17.3	29.1	31.7	26.0	0.0	0.0	0.0	0.0	21.6
LnGrp LOS				B	C	C	C					C
Approach Vol, veh/h					1991			121			43	
Approach Delay, s/veh					28.7			26.0			21.6	
Approach LOS					C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				27.0		53.0		27.0				
Change Period (Y+Rc), s				* 4.2		4.2		* 4.2				
Max Green Setting (Gmax), s				* 23		48.8		* 23				
Max Q Clear Time (g_c+I1), s				10.4		35.8		3.8				
Green Ext Time (p_c), s				0.3		8.2		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay				28.4								
HCM 2010 LOS				C								
Notes												



















HCM 2010 Signalized Intersection Summary
17: Lincoln & 3rd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	90	1633	122	36	296	0	0	236	135
Future Volume (veh/h)	0	0	0	90	1633	122	36	296	0	0	236	135
Number				1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	0.96		1.00	1.00		0.83
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1620	1588	1620	1620	1588	0	0	1525	1555
Adj Flow Rate, veh/h				94	1701	117	38	308	0	0	246	133
Adj No. of Lanes				0	3	0	0	2	0	0	2	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				119	2296	163	106	758	0	0	554	277
Arrive On Green				0.19	0.19	0.19	0.64	0.64	0.00	0.00	0.11	0.11
Sat Flow, veh/h				210	4037	286	160	2451	0	0	1814	869
Grp Volume(v), veh/h				706	588	618	175	171	0	0	202	177
Grp Sat Flow(s),veh/h/ln				1578	1445	1511	1166	1373	0	0	1448	1159
Q Serve(g_s), s				34.1	30.6	30.7	1.6	4.8	0.0	0.0	10.5	11.5
Cycle Q Clear(g_c), s				34.1	30.6	30.7	13.2	4.8	0.0	0.0	10.5	11.5
Prop In Lane				0.13		0.19	0.22		0.00	0.00		0.75
Lane Grp Cap(c), veh/h				897	822	859	426	438	0	0	462	369
V/C Ratio(X)				0.79	0.72	0.72	0.41	0.39	0.00	0.00	0.44	0.48
Avail Cap(c_a), veh/h				897	822	859	426	438	0	0	462	369
HCM Platoon Ratio				0.33	0.33	0.33	2.00	2.00	1.00	1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				27.9	26.4	26.5	11.0	10.7	0.0	0.0	29.1	29.5
Incr Delay (d2), s/veh				6.9	5.3	5.2	2.9	2.6	0.0	0.0	3.0	4.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				16.6	13.4	14.1	2.1	2.0	0.0	0.0	4.6	4.1
LnGrp Delay(d),s/veh				34.8	31.7	31.6	13.9	13.4	0.0	0.0	32.0	34.0
LnGrp LOS				C	C	C	B	B			C	C
Approach Vol, veh/h					1912			346			379	
Approach Delay, s/veh					32.8			13.6			32.9	
Approach LOS					C			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				30.0		50.0		30.0				
Change Period (Y+Rc), s				4.5		4.5		4.5				
Max Green Setting (Gmax), s				25.5		45.5		25.5				
Max Q Clear Time (g_c+I1), s				15.2		36.1		13.5				
Green Ext Time (p_c), s				1.1		6.1		1.4				
Intersection Summary												
HCM 2010 Ctrl Delay				30.3								
HCM 2010 LOS				C								





















HCM 2010 Signalized Intersection Summary
18: Tamalpais & 3rd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  							
Traffic Volume (veh/h)	0	0	0	273	1701	27	108	38	0	0	28	21
Future Volume (veh/h)	0	0	0	273	1701	27	108	38	0	0	28	21
Number				1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.90	0.94		1.00	1.00		0.91
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Adj Sat Flow, veh/h/ln				1440	1412	1440	1412	1412	0	0	1412	1440
Adj Flow Rate, veh/h				284	1772	26	112	40	0	0	29	4
Adj No. of Lanes				0	3	0	1	1	0	0	1	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				344	2305	35	310	332	0	0	249	34
Arrive On Green				0.22	0.22	0.22	0.23	0.23	0.00	0.00	0.23	0.23
Sat Flow, veh/h				521	3493	52	1033	1412	0	0	1060	146
Grp Volume(v), veh/h				755	635	691	112	40	0	0	0	33
Grp Sat Flow(s),veh/h/ln				1386	1285	1396	1033	1412	0	0	0	1206
Q Serve(g_s), s				41.6	37.0	37.1	7.7	1.8	0.0	0.0	0.0	1.7
Cycle Q Clear(g_c), s				41.6	37.0	37.1	9.4	1.8	0.0	0.0	0.0	1.7
Prop In Lane				0.38		0.04	1.00		0.00	0.00		0.12
Lane Grp Cap(c), veh/h				915	848	921	310	332	0	0	0	283
V/C Ratio(X)				0.83	0.75	0.75	0.36	0.12	0.00	0.00	0.00	0.12
Avail Cap(c_a), veh/h				915	848	921	310	332	0	0	0	283
HCM Platoon Ratio				0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				26.9	25.1	25.1	27.8	24.1	0.0	0.0	0.0	24.1
Incr Delay (d2), s/veh				8.4	6.0	5.6	3.2	0.7	0.0	0.0	0.0	0.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				18.1	14.5	15.8	2.5	0.8	0.0	0.0	0.0	0.6
LnGrp Delay(d),s/veh				35.3	31.1	30.7	31.0	24.8	0.0	0.0	0.0	24.9
LnGrp LOS				D	C	C	C	C				C
Approach Vol, veh/h					2082			152			33	
Approach Delay, s/veh					32.5			29.4			24.9	
Approach LOS					C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				23.0		57.0		23.0				
Change Period (Y+Rc), s				* 4.2		4.2		* 4.2				
Max Green Setting (Gmax), s				* 19		52.8		* 19				
Max Q Clear Time (g_c+I1), s				11.4		43.6		3.7				
Green Ext Time (p_c), s				0.4		6.5		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay				32.2								
HCM 2010 LOS				C								
Notes												













HCM 2010 Signalized Intersection Summary
 19: Hetherton & 3rd

Existing Conditions
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  						  	
Traffic Volume (veh/h)	0	0	0	462	1511	0	0	0	0	0	641	447
Future Volume (veh/h)	0	0	0	462	1511	0	0	0	0	0	641	447
Number				1	6	16				3	8	18
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.90
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1560	1588	0				0	1588	1500
Adj Flow Rate, veh/h				481	1574	0				0	668	450
Adj No. of Lanes				1	3	0				0	3	1
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				926	2680	0				0	1409	374
Arrive On Green				0.19	0.19	0.00				0.00	0.11	0.11
Sat Flow, veh/h				1486	4765	0				0	4479	1150
Grp Volume(v), veh/h				481	1574	0				0	668	450
Grp Sat Flow(s),veh/h/ln				1486	1588	0				0	1445	1150
Q Serve(g_s), s				23.6	24.2	0.0				0.0	11.6	26.0
Cycle Q Clear(g_c), s				23.6	24.2	0.0				0.0	11.6	26.0
Prop In Lane				1.00		0.00				0.00		1.00
Lane Grp Cap(c), veh/h				926	2680	0				0	1409	374
V/C Ratio(X)				0.52	0.59	0.00				0.00	0.47	1.20
Avail Cap(c_a), veh/h				926	2680	0				0	1409	374
HCM Platoon Ratio				0.33	0.33	1.00				1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				23.9	24.1	0.0				0.0	29.3	35.7
Incr Delay (d2), s/veh				2.1	1.0	0.0				0.0	1.1	114.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.3	10.9	0.0				0.0	4.8	20.2
LnGrp Delay(d),s/veh				26.0	25.0	0.0				0.0	30.4	150.3
LnGrp LOS				C	C						C	F
Approach Vol, veh/h					2055						1118	
Approach Delay, s/veh					25.3						78.7	
Approach LOS					C						E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs						6		8				
Phs Duration (G+Y+Rc), s						49.0		31.0				
Change Period (Y+Rc), s						4.0		5.0				
Max Green Setting (Gmax), s						45.0		26.0				
Max Q Clear Time (g_c+I1), s						26.2		28.0				
Green Ext Time (p_c), s						11.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				44.1								
HCM 2010 LOS				D								
Notes												



















HCM 2010 Signalized Intersection Summary
 20: Irwin & 3rd/3rd St

Existing Conditions
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑	↑	↑↑↑				
Traffic Volume (veh/h)	0	0	0	0	1102	183	865	1289	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1102	183	865	1289	0	0	0	0
Number				1	6	16	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.94	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1500	1500	1398	1398	0			
Adj Flow Rate, veh/h				0	1148	172	978	1235	0			
Adj No. of Lanes				0	3	1	2	2	0			
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %				0	2	2	3	3	0			
Cap, veh/h				0	1510	441	1381	1450	0			
Arrive On Green				0.00	0.37	0.37	0.17	0.17	0.00			
Sat Flow, veh/h				0	4230	1195	2663	2796	0			
Grp Volume(v), veh/h				0	1148	172	978	1235	0			
Grp Sat Flow(s),veh/h/ln				0	1365	1195	1331	1398	0			
Q Serve(g_s), s				0.0	19.7	8.5	27.7	34.3	0.0			
Cycle Q Clear(g_c), s				0.0	19.7	8.5	27.7	34.3	0.0			
Prop In Lane				0.00		1.00	1.00		0.00			
Lane Grp Cap(c), veh/h				0	1510	441	1381	1450	0			
V/C Ratio(X)				0.00	0.76	0.39	0.71	0.85	0.00			
Avail Cap(c_a), veh/h				0	1510	441	1381	1450	0			
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	22.1	18.6	27.4	30.2	0.0			
Incr Delay (d2), s/veh				0.0	3.7	2.6	3.1	6.5	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	7.8	3.1	10.8	14.6	0.0			
LnGrp Delay(d),s/veh				0.0	25.8	21.2	30.5	36.6	0.0			
LnGrp LOS					C	C	C	D				
Approach Vol, veh/h					1320			2213				
Approach Delay, s/veh					25.2			33.9				
Approach LOS					C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				46.0		34.0						
Change Period (Y+Rc), s				4.5		4.5						
Max Green Setting (Gmax), s				41.5		29.5						
Max Q Clear Time (g_c+I1), s				36.3		21.7						
Green Ext Time (p_c), s				4.3		4.2						
Intersection Summary												
HCM 2010 Ctrl Delay				30.7								
HCM 2010 LOS				C								
Notes												



















HCM 2010 Signalized Intersection Summary
21: D & 2nd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  										
Traffic Volume (veh/h)	0	1453	93	0	0	0	0	0	389	161	418	0
Future Volume (veh/h)	0	1453	93	0	0	0	0	0	389	161	418	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1676	1710				0	1588	1620	1765	1765	0
Adj Flow Rate, veh/h	0	1514	88				0	0	390	168	435	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	0	0	0				0	0	1145	1003	1526	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.86	0.29	0.29	0.00
Sat Flow, veh/h		0					0	0	1324	979	1765	0
Grp Volume(v), veh/h		0.0					0	0	390	168	435	0
Grp Sat Flow(s),veh/h/ln							0	0	1324	979	1765	0
Q Serve(g_s), s							0.0	0.0	1.9	4.5	6.5	0.0
Cycle Q Clear(g_c), s							0.0	0.0	1.9	6.5	6.5	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	1145	1003	1526	0
V/C Ratio(X)							0.00	0.00	0.34	0.17	0.29	0.00
Avail Cap(c_a), veh/h							0	0	1145	1003	1526	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(l)							0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh							0.0	0.0	0.4	4.7	4.0	0.0
Incr Delay (d2), s/veh							0.0	0.0	0.8	0.4	0.5	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	0.9	1.4	3.5	0.0
LnGrp Delay(d),s/veh							0.0	0.0	1.3	5.1	4.4	0.0
LnGrp LOS									A	A	A	
Approach Vol, veh/h								390			603	
Approach Delay, s/veh								1.3			4.6	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				34.0				34.0				
Change Period (Y+Rc), s				4.6				4.6				
Max Green Setting (Gmax), s				29.4				29.4				
Max Q Clear Time (g_c+I1), s				8.5				3.9				
Green Ext Time (p_c), s				1.7				1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			3.3									
HCM 2010 LOS			A									




















HCM 2010 Signalized Intersection Summary
22: C & 2nd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						  				
Traffic Volume (veh/h)	173	1833	0	0	0	0	0	232	108	0	0	0
Future Volume (veh/h)	173	1833	0	0	0	0	0	232	108	0	0	0
Number	1	6	16				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1440	1500	0				0	1500	1440			
Adj Flow Rate, veh/h	180	1909	0				0	242	105			
Adj No. of Lanes	0	3	0				0	2	0			
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0				0	2	2			
Cap, veh/h	245	2164	0				0	644	269			
Arrive On Green	0.19	0.19	0.00				0.00	0.32	0.32			
Sat Flow, veh/h	333	3814	0				0	1995	835			
Grp Volume(v), veh/h	727	1362	0				0	180	167			
Grp Sat Flow(s),veh/h/ln	1417	1365	0				0	1500	1331			
Q Serve(g_s), s	37.9	38.8	0.0				0.0	7.4	7.8			
Cycle Q Clear(g_c), s	40.1	38.8	0.0				0.0	7.4	7.8			
Prop In Lane	0.25		0.00				0.00		0.63			
Lane Grp Cap(c), veh/h	860	1549	0				0	484	429			
V/C Ratio(X)	0.84	0.88	0.00				0.00	0.37	0.39			
Avail Cap(c_a), veh/h	860	1549	0				0	484	429			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	30.3	29.8	0.0				0.0	20.9	21.0			
Incr Delay (d2), s/veh	10.0	7.4	0.0				0.0	2.2	2.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	18.1	16.3	0.0				0.0	3.3	3.2			
LnGrp Delay(d),s/veh	40.3	37.3	0.0				0.0	23.0	23.7			
LnGrp LOS	D	D						C	C			
Approach Vol, veh/h		2089						347				
Approach Delay, s/veh		38.3						23.3				
Approach LOS		D						C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				30.0		50.0						
Change Period (Y+Rc), s				* 4.2		4.6						
Max Green Setting (Gmax), s				* 26		45.4						
Max Q Clear Time (g_c+I1), s				9.8		42.1						
Green Ext Time (p_c), s				2.6		3.1						
Intersection Summary												
HCM 2010 Ctrl Delay			36.2									
HCM 2010 LOS			D									
Notes												























HCM 2010 Signalized Intersection Summary
23: B & 2nd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  										
Traffic Volume (veh/h)	0	1875	73	0	0	0	0	0	223	186	259	0
Future Volume (veh/h)	0	1875	73	0	0	0	0	0	223	186	259	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.95	0.98		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1500	1382				0	1588	1591	1560	1500	0
Adj Flow Rate, veh/h	0	1953	71				0	0	216	194	270	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	0	0	0				0	0	1101	1065	1282	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.85	0.28	0.28	0.00
Sat Flow, veh/h		0					0	0	1288	1008	1500	0
Grp Volume(v), veh/h		0.0					0	0	216	194	270	0
Grp Sat Flow(s),veh/h/ln							0	0	1288	1008	1500	0
Q Serve(g_s), s							0.0	0.0	0.9	4.6	4.3	0.0
Cycle Q Clear(g_c), s							0.0	0.0	0.9	5.5	4.3	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	1101	1065	1282	0
V/C Ratio(X)							0.00	0.00	0.20	0.18	0.21	0.00
Avail Cap(c_a), veh/h							0	0	1101	1065	1282	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(l)							0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh							0.0	0.0	0.4	4.0	3.1	0.0
Incr Delay (d2), s/veh							0.0	0.0	0.4	0.4	0.4	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	0.4	1.4	1.9	0.0
LnGrp Delay(d),s/veh							0.0	0.0	0.8	4.3	3.5	0.0
LnGrp LOS									A	A	A	
Approach Vol, veh/h								216			464	
Approach Delay, s/veh								0.8			3.9	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				31.0				31.0				
Change Period (Y+Rc), s				4.5				4.5				
Max Green Setting (Gmax), s				26.5				26.5				
Max Q Clear Time (g_c+I1), s				7.5				2.9				
Green Ext Time (p_c), s				1.3				0.6				
Intersection Summary												
HCM 2010 Ctrl Delay			2.9									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary
24: A & 2nd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						  		 		
Traffic Volume (veh/h)	91	2036	157	0	0	0	0	286	25	106	119	0
Future Volume (veh/h)	91	2036	157	0	0	0	0	286	25	106	119	0
Number	5	2	12				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95				1.00		0.92	0.96		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1765	1800				0	1676	1710	1676	1744	0
Adj Flow Rate, veh/h	95	2121	153				0	298	18	110	124	0
Adj No. of Lanes	0	3	0				0	2	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	111	2617	193				0	636	38	264	543	0
Arrive On Green	0.19	0.19	0.19				0.00	0.21	0.21	0.03	0.21	0.00
Sat Flow, veh/h	191	4523	334				0	3120	182	1597	1744	0
Grp Volume(v), veh/h	871	724	774				0	155	161	110	124	0
Grp Sat Flow(s),veh/h/ln	1755	1606	1687				0	1593	1625	1597	1744	0
Q Serve(g_s), s	38.5	34.4	35.1				0.0	6.8	7.0	0.0	4.7	0.0
Cycle Q Clear(g_c), s	38.5	34.4	35.1				0.0	6.8	7.0	0.0	4.7	0.0
Prop In Lane	0.11		0.20				0.00		0.11	1.00		0.00
Lane Grp Cap(c), veh/h	1015	929	976				0	334	340	264	543	0
V/C Ratio(X)	0.86	0.78	0.79				0.00	0.47	0.47	0.42	0.23	0.00
Avail Cap(c_a), veh/h	1015	929	976				0	334	340	264	543	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.3	27.6	27.9				0.0	27.8	27.8	33.5	23.7	0.0
Incr Delay (d2), s/veh	9.3	6.4	6.6				0.0	4.6	4.6	4.8	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.4	16.9	18.2				0.0	3.4	3.6	2.7	2.4	0.0
LnGrp Delay(d),s/veh	38.6	34.0	34.4				0.0	32.4	32.4	38.2	24.7	0.0
LnGrp LOS	D	C	C					C	C	D	C	
Approach Vol, veh/h		2369						316			234	
Approach Delay, s/veh		35.8						32.4			31.1	
Approach LOS		D						C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		51.0		29.2			8.2	21.0				
Change Period (Y+Rc), s		4.6		* 4.2			* 4.2	* 4.2				
Max Green Setting (Gmax), s		46.4		* 25			* 4	* 17				
Max Q Clear Time (g_c+I1), s		40.5		6.7			2.0	9.0				
Green Ext Time (p_c), s		5.7		0.8			0.1	1.5				
Intersection Summary												
HCM 2010 Ctrl Delay			35.1									
HCM 2010 LOS			D									
Notes												

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

BioMarin
Existing Conditions
PM Peak Hour

Intersection 25 Brooks St/2nd St Side-street Stop


















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	64	52	81.7%	26.0	4.3	D
	Through						
	Right Turn						
	Subtotal	64	52	81.7%	26.0	4.3	D
EB	Left Turn	35	30	85.2%	3.0	0.4	A
	Through	2,165	2,050	94.7%	2.3	0.2	A
	Right Turn						
	Subtotal	2,200	2,080	94.5%	2.4	0.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,264	2,132	94.2%	2.9	0.3	A

Intersection 26 Lindaro St/2nd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	70	63	89.4%	17.1	4.4	B
	Right Turn	277	254	91.7%	13.0	2.5	B
	Subtotal	347	316	91.2%	13.7	2.4	B
SB	Left Turn	91	85	93.4%	20.2	4.2	C
	Through	148	143	96.5%	16.3	3.3	B
	Right Turn						
	Subtotal	239	228	95.3%	17.8	2.7	B
EB	Left Turn	47	44	93.2%	14.6	2.5	B
	Through	2,120	1,979	93.4%	12.9	1.1	B
	Right Turn	32	26	82.8%	9.0	2.9	A
	Subtotal	2,199	2,049	93.2%	12.8	1.1	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,785	2,594	93.1%	13.4	1.0	B



















HCM 2010 Signalized Intersection Summary
27: Lincoln & 2nd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	2182	46	0	0	0	0	182	123	114	155	0
Future Volume (veh/h)	200	2182	46	0	0	0	0	182	123	114	155	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1412	1412				0	1412	1412	1382	1355	0
Adj Flow Rate, veh/h	208	2273	26				0	190	118	119	161	0
Adj No. of Lanes	0	4	1				0	1	1	0	2	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	216	2540	642				0	491	404	269	440	0
Arrive On Green	0.18	0.18	0.18				0.00	0.35	0.35	0.69	0.69	0.00
Sat Flow, veh/h	394	4640	1172				0	1412	1162	532	1328	0
Grp Volume(v), veh/h	734	1747	26				0	190	118	137	143	0
Grp Sat Flow(s),veh/h/ln	1392	1214	1172				0	1412	1162	627	1172	0
Q Serve(g_s), s	41.9	37.3	1.5				0.0	8.1	5.9	8.7	3.9	0.0
Cycle Q Clear(g_c), s	41.9	37.3	1.5				0.0	8.1	5.9	16.9	3.9	0.0
Prop In Lane	0.28		1.00				0.00		1.00	0.87		0.00
Lane Grp Cap(c), veh/h	762	1994	642				0	491	404	302	407	0
V/C Ratio(X)	0.96	0.88	0.04				0.00	0.39	0.29	0.45	0.35	0.00
Avail Cap(c_a), veh/h	762	1994	642				0	491	404	302	407	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.0	30.1	15.4				0.0	19.7	19.0	13.0	8.6	0.0
Incr Delay (d2), s/veh	24.8	5.8	0.1				0.0	2.3	1.8	4.9	2.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.4	13.6	0.5				0.0	3.5	2.1	2.5	1.5	0.0
LnGrp Delay(d),s/veh	56.8	35.9	15.5				0.0	22.0	20.8	17.9	10.9	0.0
LnGrp LOS	E	D	B					C	C	B	B	
Approach Vol, veh/h		2507						308			280	
Approach Delay, s/veh		41.8						21.5			14.3	
Approach LOS		D						C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		48.0		32.0				32.0				
Change Period (Y+Rc), s		* 4.2		* 4.2				* 4.2				
Max Green Setting (Gmax), s		* 44		* 28				* 28				
Max Q Clear Time (g_c+I1), s		43.9		10.1				18.9				
Green Ext Time (p_c), s		0.0		1.2				0.8				
Intersection Summary												
HCM 2010 Ctrl Delay			37.3									
HCM 2010 LOS			D									
Notes												

















HCM 2010 Signalized Intersection Summary
 28: Francisco W./Tamalpais & 2nd

Existing Conditions
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	2283	109	0	0	0	0	128	330	75	217	0
Future Volume (veh/h)	27	2283	109	0	0	0	0	128	330	75	217	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93				1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1412	1412				0	1412	1468	1412	1412	0
Adj Flow Rate, veh/h	28	2378	64				0	133	330	78	226	0
Adj No. of Lanes	0	4	1				0	1	1	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	29	2654	593				0	503	434	304	503	0
Arrive On Green	0.18	0.18	0.18				0.00	0.36	0.36	0.71	0.71	0.00
Sat Flow, veh/h	55	4996	1117				0	1412	1217	740	1412	0
Grp Volume(v), veh/h	718	1688	64				0	133	330	78	226	0
Grp Sat Flow(s),veh/h/ln	1409	1214	1117				0	1412	1217	740	1412	0
Q Serve(g_s), s	40.4	36.1	3.9				0.0	5.4	19.2	4.5	5.4	0.0
Cycle Q Clear(g_c), s	40.4	36.1	3.9				0.0	5.4	19.2	9.9	5.4	0.0
Prop In Lane	0.04		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	749	1935	593				0	503	434	304	503	0
V/C Ratio(X)	0.96	0.87	0.11				0.00	0.26	0.76	0.26	0.45	0.00
Avail Cap(c_a), veh/h	749	1935	593				0	503	434	304	503	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.1	30.3	17.1				0.0	18.3	22.7	10.3	8.2	0.0
Incr Delay (d2), s/veh	24.3	5.8	0.4				0.0	1.3	11.9	2.0	2.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.8	13.2	1.3				0.0	2.2	7.8	1.1	2.4	0.0
LnGrp Delay(d),s/veh	56.4	36.1	17.4				0.0	19.6	34.6	12.3	11.1	0.0
LnGrp LOS	E	D	B					B	C	B	B	
Approach Vol, veh/h		2470						463			304	
Approach Delay, s/veh		41.5						30.3			11.4	
Approach LOS		D						C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		47.0		33.0				33.0				
Change Period (Y+Rc), s		4.5		4.5				4.5				
Max Green Setting (Gmax), s		42.5		28.5				28.5				
Max Q Clear Time (g_c+I1), s		42.4		21.2				11.9				
Green Ext Time (p_c), s		0.1		1.3				1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			37.1									
HCM 2010 LOS			D									






















HCM 2010 Signalized Intersection Summary
 29: 101 SBO on Hetherton/Hetherton & 2nd/2nd St

Existing Conditions
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1717	965	0	0	0	0	0	0	347	756	0
Future Volume (veh/h)	0	1717	965	0	0	0	0	0	0	347	756	0
Number	5	2	12							3	8	18
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1500	1500							1500	1500	0
Adj Flow Rate, veh/h	0	1731	973							361	788	0
Adj No. of Lanes	0	3	2							1	2	0
Peak Hour Factor	0.96	0.96	0.96							0.96	0.96	0.96
Percent Heavy Veh, %	0	2	2							2	2	0
Cap, veh/h	0	2278	1291							545	1144	0
Arrive On Green	0.00	0.17	0.17							0.13	0.13	0.00
Sat Flow, veh/h	0	4500	2550							1429	3000	0
Grp Volume(v), veh/h	0	1731	973							361	788	0
Grp Sat Flow(s),veh/h/ln	0	1500	1275							1429	1500	0
Q Serve(g_s), s	0.0	29.4	29.1							19.3	20.1	0.0
Cycle Q Clear(g_c), s	0.0	29.4	29.1							19.3	20.1	0.0
Prop In Lane	0.00		1.00							1.00		0.00
Lane Grp Cap(c), veh/h	0	2278	1291							545	1144	0
V/C Ratio(X)	0.00	0.76	0.75							0.66	0.69	0.00
Avail Cap(c_a), veh/h	0	2278	1291							545	1144	0
HCM Platoon Ratio	1.00	0.33	0.33							0.33	0.33	1.00
Upstream Filter(I)	0.00	1.00	1.00							1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	28.7	28.6							30.1	30.4	0.0
Incr Delay (d2), s/veh	0.0	2.4	4.1							6.2	3.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.7	11.0							8.6	8.9	0.0
LnGrp Delay(d),s/veh	0.0	31.1	32.7							36.3	33.8	0.0
LnGrp LOS		C	C							D	C	
Approach Vol, veh/h		2704									1149	
Approach Delay, s/veh		31.7									34.6	
Approach LOS		C									C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2						8				
Phs Duration (G+Y+Rc), s		45.0						35.0				
Change Period (Y+Rc), s		4.5						4.5				
Max Green Setting (Gmax), s		40.5						30.5				
Max Q Clear Time (g_c+I1), s		31.4						22.1				
Green Ext Time (p_c), s		7.9						3.7				
Intersection Summary												
HCM 2010 Ctrl Delay			32.6									
HCM 2010 LOS			C									
Notes												






















HCM 2010 Signalized Intersection Summary
30: Irwin & 2nd St

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		   						  				
Traffic Volume (veh/h)	855	1259	0	0	0	0	0	1318	542	0	0	0
Future Volume (veh/h)	855	1259	0	0	0	0	0	1318	542	0	0	0
Number	5	2	12				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.94			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1468	1500	0				0	1412	1412			
Adj Flow Rate, veh/h	960	1214	0				0	1373	549			
Adj No. of Lanes	2	2	0				0	3	1			
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0				0	2	2			
Cap, veh/h	1501	1418	0				0	1580	464			
Arrive On Green	0.16	0.16	0.00				0.00	0.41	0.41			
Sat Flow, veh/h	2797	3000	0				0	3981	1132			
Grp Volume(v), veh/h	960	1214	0				0	1373	549			
Grp Sat Flow(s),veh/h/ln	1398	1500	0				0	1285	1132			
Q Serve(g_s), s	26.1	31.5	0.0				0.0	26.1	32.8			
Cycle Q Clear(g_c), s	26.1	31.5	0.0				0.0	26.1	32.8			
Prop In Lane	1.00		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	1501	1418	0				0	1580	464			
V/C Ratio(X)	0.64	0.86	0.00				0.00	0.87	1.18			
Avail Cap(c_a), veh/h	1501	1418	0				0	1580	464			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(l)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	28.8	31.1	0.0				0.0	21.6	23.6			
Incr Delay (d2), s/veh	2.1	6.8	0.0				0.0	6.8	102.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	10.6	14.4	0.0				0.0	10.1	23.4			
LnGrp Delay(d),s/veh	30.9	38.0	0.0				0.0	28.4	126.2			
LnGrp LOS	C	D						C	F			
Approach Vol, veh/h		2174						1922				
Approach Delay, s/veh		34.9						56.3				
Approach LOS		C						E				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		42.0		38.0								
Change Period (Y+Rc), s		* 4.2		* 5.2								
Max Green Setting (Gmax), s		* 38		* 33								
Max Q Clear Time (g_c+I1), s		33.5		34.8								
Green Ext Time (p_c), s		4.1		0.0								
Intersection Summary												
HCM 2010 Ctrl Delay			44.9									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary
31: Lindaro & Andersen

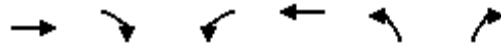
Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	265	34	68	268	43	55	207	156	79	118	21
Future Volume (veh/h)	13	265	34	68	268	43	55	207	156	79	118	21
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.96	1.00		0.92
Parking Bus, Adj	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 Sat Flow, veh/h/ln	2039	2039	2000	1961	1961	2000	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	14	276	29	71	279	38	57	216	130	82	123	15
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	41	381	40	157	461	63	287	301	181	206	381	46
Arrive On Green	0.02	0.21	0.21	0.08	0.27	0.27	0.16	0.28	0.28	0.12	0.24	0.24
Sat Flow, veh/h	1942	1806	190	1867	1681	229	1774	1070	644	1774	1612	197
Grp Volume(v), veh/h	14	0	305	71	0	317	57	0	346	82	0	138
Grp Sat Flow(s),veh/h/ln	1942	0	1996	1867	0	1910	1774	0	1715	1774	0	1808
Q Serve(g_s), s	0.4	0.0	7.9	2.0	0.0	8.0	1.5	0.0	10.1	2.4	0.0	3.5
Cycle Q Clear(g_c), s	0.4	0.0	7.9	2.0	0.0	8.0	1.5	0.0	10.1	2.4	0.0	3.5
Prop In Lane	1.00		0.10	1.00		0.12	1.00		0.38	1.00		0.11
Lane Grp Cap(c), veh/h	41	0	422	157	0	523	287	0	483	206	0	427
V/C Ratio(X)	0.34	0.00	0.72	0.45	0.00	0.61	0.20	0.00	0.72	0.40	0.00	0.32
Avail Cap(c_a), veh/h	279	0	893	336	0	923	319	0	709	319	0	747
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	20.4	24.3	0.0	17.6	20.2	0.0	18.0	22.8	0.0	17.6
Incr Delay (d2), s/veh	1.8	0.0	2.4	0.8	0.0	1.1	0.1	0.0	2.0	0.5	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	4.6	1.1	0.0	4.4	0.8	0.0	5.0	1.2	0.0	1.8
LnGrp Delay(d),s/veh	28.7	0.0	22.8	25.0	0.0	18.7	20.3	0.0	20.0	23.3	0.0	18.0
LnGrp LOS	C		C	C		B	C		C	C		B
Approach Vol, veh/h		319			388			403			220	
Approach Delay, s/veh		23.1			19.9			20.0			20.0	
Approach LOS		C			B			C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.7	16.7	13.0	17.3	5.2	20.2	10.5	19.9				
Change Period (Y+Rc), s	4.0	4.9	4.0	* 4.2	4.0	4.9	4.0	* 4.2				
Max Green Setting (Gmax), s	10.0	24.9	10.0	* 23	8.0	26.9	10.0	* 23				
Max Q Clear Time (g_c+I1), s	4.0	9.9	3.5	5.5	2.4	10.0	4.4	12.1				
Green Ext Time (p_c), s	0.0	1.1	0.0	0.4	0.0	1.1	0.1	1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			20.7									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis

32: Tamalpais & Mission

Existing Conditions
Timing Plan: PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Traffic Volume (vph)	460	28	0	588	6	11
Future Volume (vph)	460	28	0	588	6	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0			3.0	5.6	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	0.99	
Frt	0.99			1.00	0.91	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	1571			1588	1408	
Flt Permitted	1.00			1.00	0.98	
Satd. Flow (perm)	1571			1588	1408	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	479	29	0	612	6	11
RTOR Reduction (vph)	3	0	0	0	9	0
Lane Group Flow (vph)	505	0	0	613	8	0
Confl. Peds. (#/hr)		10	10		10	
Turn Type	NA			NA	Perm	
Protected Phases	2			3 4 6		
Permitted Phases					8	
Actuated Green, G (s)	34.7			55.4	13.4	
Effective Green, g (s)	34.7			49.4	13.4	
Actuated g/C Ratio	0.43			0.62	0.17	
Clearance Time (s)	6.0				5.6	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	681			980	235	
v/s Ratio Prot	c0.32			c0.39		
v/s Ratio Perm					c0.01	
v/c Ratio	0.74			0.63	0.03	
Uniform Delay, d1	18.9			9.5	27.9	
Progression Factor	0.65			0.27	0.62	
Incremental Delay, d2	6.5			0.4	0.1	
Delay (s)	18.8			3.0	17.2	
Level of Service	B			A	B	
Approach Delay (s)	18.8			3.0	17.2	
Approach LOS	B			A	B	

Intersection Summary

HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

33: Tamalpais & 5th

Existing Conditions

Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Traffic Volume (vph)	0	432	1	0	275	7	22	16	18	9	10	11
Future Volume (vph)	0	432	1	0	275	7	22	16	18	9	10	11
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			1.00			1.00			0.98	
Flpb, ped/bikes		1.00			1.00			0.99			1.00	
Frt		1.00			1.00			0.96			0.95	
Flt Protected		1.00			1.00			0.98			0.99	
Satd. Flow (prot)		1588			1581			1476			1463	
Flt Permitted		1.00			1.00			0.86			0.88	
Satd. Flow (perm)		1588			1581			1293			1308	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	450	1	0	286	7	23	17	19	9	10	11
RTOR Reduction (vph)	0	0	0	0	1	0	0	17	0	0	10	0
Lane Group Flow (vph)	0	451	0	0	292	0	0	42	0	0	20	0
Confl. Peds. (#/hr)	10		10	10		10	10					10
Turn Type		NA			NA		Perm	NA		Perm	NA	
Protected Phases		2			4	6		8			8	
Permitted Phases							8			8		
Actuated Green, G (s)		44.2			59.5			8.5			8.5	
Effective Green, g (s)		44.2			59.5			8.5			8.5	
Actuated g/C Ratio		0.55			0.74			0.11			0.11	
Clearance Time (s)		6.0						6.0			6.0	
Vehicle Extension (s)		3.0						1.5			1.5	
Lane Grp Cap (vph)		877			1175			137			138	
v/s Ratio Prot		c0.28			c0.18							
v/s Ratio Perm								c0.03			0.02	
v/c Ratio		0.51			0.25			0.31			0.15	
Uniform Delay, d1		11.2			3.2			33.0			32.5	
Progression Factor		0.59			0.06			0.38			0.79	
Incremental Delay, d2		1.9			0.0			0.4			0.1	
Delay (s)		8.4			0.2			12.9			25.7	
Level of Service		A			A			B			C	
Approach Delay (s)		8.4			0.2			12.9			25.7	
Approach LOS		A			A			B			C	

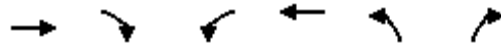
Intersection Summary

HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

34: Tamalpais & Mission

Existing Conditions
Timing Plan: PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Traffic Volume (vph)	471	0	0	582	6	11
Future Volume (vph)	471	0	0	582	6	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0			6.0	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.91	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	1588			1588	1424	
Flt Permitted	1.00			1.00	0.98	
Satd. Flow (perm)	1588			1588	1424	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	491	0	0	606	6	11
RTOR Reduction (vph)	0	0	0	0	9	0
Lane Group Flow (vph)	491	0	0	606	8	0
Confl. Peds. (#/hr)		10				
Turn Type	NA			NA	Prot	
Protected Phases	2 8			6	3 4	
Permitted Phases						
Actuated Green, G (s)	53.7			34.7	14.7	
Effective Green, g (s)	48.1			34.7	14.7	
Actuated g/C Ratio	0.60			0.43	0.18	
Clearance Time (s)				6.0		
Vehicle Extension (s)				3.0		
Lane Grp Cap (vph)	954			688	261	
v/s Ratio Prot	c0.31			c0.38	c0.01	
v/s Ratio Perm						
v/c Ratio	0.51			0.88	0.03	
Uniform Delay, d1	9.2			20.8	26.8	
Progression Factor	0.19			1.04	1.58	
Incremental Delay, d2	0.3			11.6	0.0	
Delay (s)	2.0			33.1	42.4	
Level of Service	A			C	D	
Approach Delay (s)	2.0			33.1	42.4	
Approach LOS	A			C	D	
Intersection Summary						
HCM 2000 Control Delay		19.6		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.63				
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		20.2
Intersection Capacity Utilization		47.6%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

35: Tamalpais & 5th













Existing Conditions
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑			↑			↑					
Traffic Volume (vph)	0	459	0	0	271	9	11	10	15	0	0	0	
Future Volume (vph)	0	459	0	0	271	9	11	10	15	0	0	0	
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Total Lost time (s)		6.0			6.0			6.0					
Lane Util. Factor		1.00			1.00			1.00					
Frbp, ped/bikes		1.00			1.00			0.98					
Flpb, ped/bikes		1.00			1.00			1.00					
Frt		1.00			1.00			0.94					
Flt Protected		1.00			1.00			0.99					
Satd. Flow (prot)		1588			1579			1445					
Flt Permitted		1.00			1.00			0.99					
Satd. Flow (perm)		1588			1579			1445					
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0	478	0	0	282	9	11	10	16	0	0	0	
RTOR Reduction (vph)	0	0	0	0	1	0	0	14	0	0	0	0	
Lane Group Flow (vph)	0	478	0	0	290	0	0	23	0	0	0	0	
Confl. Peds. (#/hr)	10		10			10			10				
Turn Type		NA			NA		Split	NA					
Protected Phases		2 8			6		4	4					
Permitted Phases													
Actuated Green, G (s)		58.7			44.2			9.3					
Effective Green, g (s)		58.7			44.2			9.3					
Actuated g/C Ratio		0.73			0.55			0.12					
Clearance Time (s)					6.0			6.0					
Vehicle Extension (s)					3.0			1.5					
Lane Grp Cap (vph)		1165			872			167					
v/s Ratio Prot		c0.30			0.18			c0.02					
v/s Ratio Perm													
v/c Ratio		0.41			0.33			0.14					
Uniform Delay, d1		4.1			9.8			31.7					
Progression Factor		0.06			0.51			1.04					
Incremental Delay, d2		0.1			1.0			0.1					
Delay (s)		0.3			6.0			33.2					
Level of Service		A			A			C					
Approach Delay (s)		0.3			6.0			33.2			0.0		
Approach LOS		A			A			C			A		
Intersection Summary													
HCM 2000 Control Delay			3.9									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.41										
Actuated Cycle Length (s)			80.0									Sum of lost time (s)	18.0
Intersection Capacity Utilization			45.1%									ICU Level of Service	A
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
36: Tamalpais & 4th

Existing Conditions
Timing Plan: PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑			↑			↑					
Traffic Volume (vph)	0	348	0	0	397	26	11	3	11	0	0	0	
Future Volume (vph)	0	348	0	0	397	26	11	3	11	0	0	0	
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Total Lost time (s)		6.0			6.0			6.0					
Lane Util. Factor		1.00			1.00			1.00					
Frbp, ped/bikes		1.00			0.99			0.99					
Flpb, ped/bikes		1.00			1.00			1.00					
Frt		1.00			0.99			0.94					
Flt Protected		1.00			1.00			0.98					
Satd. Flow (prot)		1588			1558			1444					
Flt Permitted		1.00			1.00			0.98					
Satd. Flow (perm)		1588			1558			1444					
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0	362	0	0	414	27	11	3	11	0	0	0	
RTOR Reduction (vph)	0	0	0	0	3	0	0	9	0	0	0	0	
Lane Group Flow (vph)	0	363	0	0	438	0	0	16	0	0	0	0	
Confl. Peds. (#/hr)	59		21			59			10				
Turn Type		NA			NA		Split	NA					
Protected Phases		2 8			6		4	4					
Permitted Phases													
Actuated Green, G (s)		55.4			37.1			13.0					
Effective Green, g (s)		55.4			37.1			13.0					
Actuated g/C Ratio		0.69			0.46			0.16					
Clearance Time (s)					6.0			6.0					
Vehicle Extension (s)					3.0			3.0					
Lane Grp Cap (vph)		1099			722			234					
v/s Ratio Prot		c0.23			c0.28			c0.01					
v/s Ratio Perm													
v/c Ratio		0.33			0.61			0.07					
Uniform Delay, d1		4.9			16.0			28.4					
Progression Factor		0.21			0.77			1.00					
Incremental Delay, d2		0.2			3.5			0.1					
Delay (s)		1.2			15.8			28.5					
Level of Service		A			B			C					
Approach Delay (s)		1.2			15.8			28.5			0.0		
Approach LOS		A			B			C			A		
Intersection Summary													
HCM 2000 Control Delay			9.8									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.45										
Actuated Cycle Length (s)			80.0									Sum of lost time (s)	17.6
Intersection Capacity Utilization			45.5%									ICU Level of Service	A
Analysis Period (min)			15										
c Critical Lane Group													

Arterial Level of Service: EB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lincoln	IV	25	28.5	13.9	42.4	0.16	13.4	C
Tamalpais	IV	25	16.0	31.3	47.3	0.06	4.6	F
Tamalpais	IV	25	3.1	4.3	7.4	0.01	5.7	F
Hetherton	IV	25	8.7	9.6	18.3	0.03	6.5	F
Irwin	IV	25	18.9	14.0	32.9	0.07	7.8	E
Total	IV		75.2	73.1	148.3	0.33	8.1	E

Arterial Level of Service: WB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Irwin	IV	25	21.6	27.0	48.6	0.10	7.3	E
101 SB Off Hetherton	IV	25	18.9	23.2	42.1	0.07	6.1	F
Tamalpais	IV	25	8.7	64.3	73.0	0.03	1.6	F
Tamalpais	IV	25	3.1	3.5	6.6	0.01	6.4	F
Lincoln	IV	25	16.0	55.9	71.9	0.06	3.0	F
Total	IV		68.3	173.9	242.2	0.27	4.1	F

Arterial Level of Service: SB Hetherton

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Mission	IV	29	24.0	35.7	59.7	0.16	9.6	D
5th	IV	25	16.3	3.1	19.4	0.06	11.4	D
4th	IV	25	14.6	5.9	20.5	0.05	9.6	D
3rd	IV	25	17.7	14.9	32.6	0.07	7.4	E
2nd	IV	25	15.6	67.6	83.2	0.06	2.5	F
Total	IV		88.2	127.2	215.4	0.40	6.7	F

Arterial Level of Service: NB Irwin

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
2nd St	IV	30	25.2	25.9	51.1	0.17	11.8	D
3rd St	IV	25	14.8	15.1	29.9	0.06	6.7	F
4th	IV	25	18.3	14.9	33.2	0.07	7.5	E
5th	IV	25	14.6	7.6	22.2	0.06	8.9	E
Mission	IV	25	15.7	5.6	21.3	0.06	10.0	D
Total	IV		88.6	69.1	157.7	0.41	9.3	D

Arterial Level of Service: EB 2nd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
D	IV	25	18.1	23.6	41.7	0.07	5.9	F
C	IV	25	18.9	9.5	28.4	0.07	9.1	D
B	IV	25	17.9	25.8	43.7	0.07	5.6	F
A	IV	25	18.5	9.5	28.0	0.07	9.0	E
Lindaro	IV	25	25.3	10.8	36.1	0.14	14.0	C
Lincoln	IV	25	21.4	38.0	59.4	0.10	5.9	F
Francisco W.	IV	25	12.2	26.6	38.8	0.05	4.3	F
101 SBO on 2nd	IV	25	14.2	8.7	22.9	0.05	8.4	E
Total	IV		146.5	152.5	299.0	0.61	7.4	E

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	11.6	30.6	0.07	8.4	E
Tamalpais	IV	25	14.4	7.1	21.5	0.05	9.1	D
Lincoln	IV	25	13.2	4.3	17.5	0.05	10.3	D
Lindaro	IV	25	21.4	3.1	24.5	0.10	14.3	C
A	IV	25	25.3	15.7	41.0	0.14	12.3	D
B	IV	25	17.9	8.1	26.0	0.07	9.3	D
C	IV	25	19.0	4.2	23.2	0.07	11.1	D
D	IV	25	18.7	2.4	21.1	0.07	12.0	D
Total	IV		148.9	56.5	205.4	0.62	10.9	D

Arterial Level of Service: EB 2nd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
D	IV	25	18.1	16.7	34.8	0.07	7.1	E
C	IV	25	18.9	12.6	31.5	0.07	8.2	E
B	IV	25	17.9	10.1	28.0	0.07	8.7	E
A	IV	25	18.5	10.3	28.8	0.07	8.7	E
Lindaro	IV	25	25.3	9.2	34.5	0.14	14.6	C
Lincoln	IV	25	21.4	23.0	44.4	0.10	7.9	E
Francisco W.	IV	25	12.2	12.9	25.1	0.05	6.6	F
101 SBO on Hetherton	IV	25	14.2	18.3	32.5	0.05	5.9	F
Total	IV		146.5	113.1	259.6	0.61	8.5	E

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	9.4	28.4	0.07	9.1	D
Tamalpais	IV	25	14.4	8.1	22.5	0.05	8.7	E
Lincoln	IV	25	13.2	7.0	20.2	0.05	8.9	E
Lindaro	IV	25	21.4	4.4	25.8	0.10	13.6	C
A	IV	25	25.3	5.6	30.9	0.14	16.4	C
B	IV	25	17.9	5.9	23.8	0.07	10.2	D
C	IV	25	19.0	3.9	22.9	0.07	11.3	D
D	IV	25	18.7	2.5	21.2	0.07	12.0	D
Total	IV		148.9	46.8	195.7	0.62	11.5	D

Arterial Level of Service: SB Hetherton

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Mission	IV	35	22.2	29.0	51.2	0.16	11.2	D
5th	IV	25	16.3	6.1	22.4	0.06	9.9	D
4th	IV	25	14.6	7.2	21.8	0.05	9.1	D
3rd	IV	25	17.7	25.0	42.7	0.07	5.6	F
2nd	IV	25	15.6	24.2	39.8	0.06	5.3	F
Total	IV		86.4	91.5	177.9	0.40	8.1	E

Arterial Level of Service: NB Irwin

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
2nd St	IV	38	19.3	29.2	48.5	0.17	12.5	D
3rd St	IV	25	14.8	16.9	31.7	0.06	6.3	F
4th	IV	25	18.9	3.6	22.5	0.07	11.4	D
5th	IV	25	14.0	11.3	25.3	0.05	7.5	E
Mission	IV	25	15.7	2.9	18.6	0.06	11.5	D
Total	IV		82.7	63.9	146.6	0.41	10.0	D

Arterial Level of Service: EB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lincoln	IV	25	28.5	11.3	39.8	0.16	14.3	C
Tamalpais	IV	25	16.1	14.9	31.0	0.06	7.1	E
Tamalpais	IV	25	4.3	1.9	6.2	0.02	9.5	D
Hetherton	IV	25	7.5	7.1	14.6	0.03	7.0	F
Irwin	IV	25	18.9	13.5	32.4	0.07	7.9	E
Total	IV		75.3	48.7	124.0	0.33	9.7	D

Arterial Level of Service: WB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Irwin	IV	25	21.6	29.8	51.4	0.10	6.9	F
Hetherton	IV	25	18.9	7.3	26.2	0.07	9.8	D
Tamalpais	IV	25	7.5	29.7	37.2	0.03	2.7	F
Tamalpais	IV	25	4.3	2.2	6.5	0.02	9.0	D
Lincoln	IV	25	16.1	23.6	39.7	0.06	5.5	F
Total	IV		68.4	92.6	161.0	0.27	6.1	F

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour
Project Description	BioMarin - US 101 NB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	4	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	2.86
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	1.02
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	5469	Heavy Vehicle Adjustment Factor (f_{HV})	0.889
Peak Hour Factor (PHF)	0.99	Flow Rate ($v_{p,GP}$), pc/h/ln	1554
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.68
Passenger Car Equivalent (E_T)	3.840		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	25.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	2.86

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1039	Heavy Vehicle Adjustment Factor (f_{HV})	0.916
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1246
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.76
Passenger Car Equivalent (E_T)	5.597		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	58.3
Speed 2 (S_2), mi/h	1.7	Density (D_{ML}), pc/mi/ln	21.4
Speed 2 (S_3), mi/h	7.7	Level of Service (LOS)	C

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour
Project Description	BioMarin - US 101 NB Second Street to Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	3780	Heavy Vehicle Adjustment Factor (f_{HV})	0.919
Peak Hour Factor (PHF)	0.99	Flow Rate ($v_{p,GP}$), pc/h/ln	1385
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.60
Passenger Car Equivalent (E_T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	23.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	718	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	820
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.50
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.8
Speed 2 (S_2), mi/h	0.2	Density (D_{ML}), pc/mi/ln	13.7
Speed 2 (S_3), mi/h	1.4	Level of Service (LOS)	B

HCS7 Freeway Weaving Report

Project Information

Analyst	Fehr & Peers	Date	3/18/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour
Project Description	BioMarin - US 101 NB I-580 to Second Street Weave Segment		

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Freeway
Short Length (L _s), ft	2900	Number of Maneuver Lanes (N _{WL}), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LC _{RF}), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LC _{FR}), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LC _{RR}), lc	0
Interchange Density (ID), int/mi	1.33	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Volume (V _i), veh/h	2058	1722	823	985
Peak Hour Factor (PHF)	0.99	0.93	0.93	0.95
Total Trucks, %	4.40	4.40	4.09	4.09
Heavy Vehicle Adjustment Factor (f _{HV})	0.958	0.958	0.961	0.961
Flow Rate (v _i), pc/h	2170	1933	921	1079
Weaving Flow Rate (v _w), pc/h	3012	Freeway Max Capacity (c _{IFL}), pc/h/ln		2300
Non-Weaving Flow Rate (v _{NW}), pc/h	3091	Density-Based Capacity (c _{NWL}), pc/h/ln		1928
Total Flow Rate (v), pc/h	6103	Demand Flow-Based Capacity (c _W), pc/h		4858
Volume Ratio (VR)	0.494	Weaving Segment Capacity (c _w), veh/h		4654
Minimum Lane Change Rate (LC _{MIN}), lc/h	0	Adjusted Weaving Area Capacity (c _{wa}), veh/h		4654
Maximum Weaving Length (L _{MAX}), ft	7756	Volume-to-Capacity Ratio (v/c)		1.26

Speed and Density

Non-Weaving Vehicle Index (I _{NW})	-	Average Weaving Speed (S _w), mi/h	-
Non-Weaving Lane Change Rate (LC _{NW}), lc/h	-	Average Non-Weaving Speed (S _{NW}), mi/h	-
Weaving Lane Change Rate (LC _w), lc/h	-	Average Speed (S), mi/h	-
Total Lane Change Rate (LC _{All}), lc/h	-	Density (D), pc/mi/ln	-
Weaving Intensity Factor (W)	-	Level of Service (LOS)	F

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Level
Managed Lane Length, ft	5280	Percent Grade, %	-
Managed Lane Adjustment Factors			
Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V_{ML}), veh/h	1062	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1191
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.72
Passenger Car Equivalent (E_T)	2.000		
Managed Lane Speed and Density			
Breakpoint (BP_{ML})	501	Indicator Variable	1
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	52.0
Speed 2 (S_2), mi/h	1.4	Density (D_{ML}), pc/mi/ln	22.9
Speed 2 (S_3), mi/h	6.6	Level of Service (LOS)	C

Leisch Method for Weaving Analysis

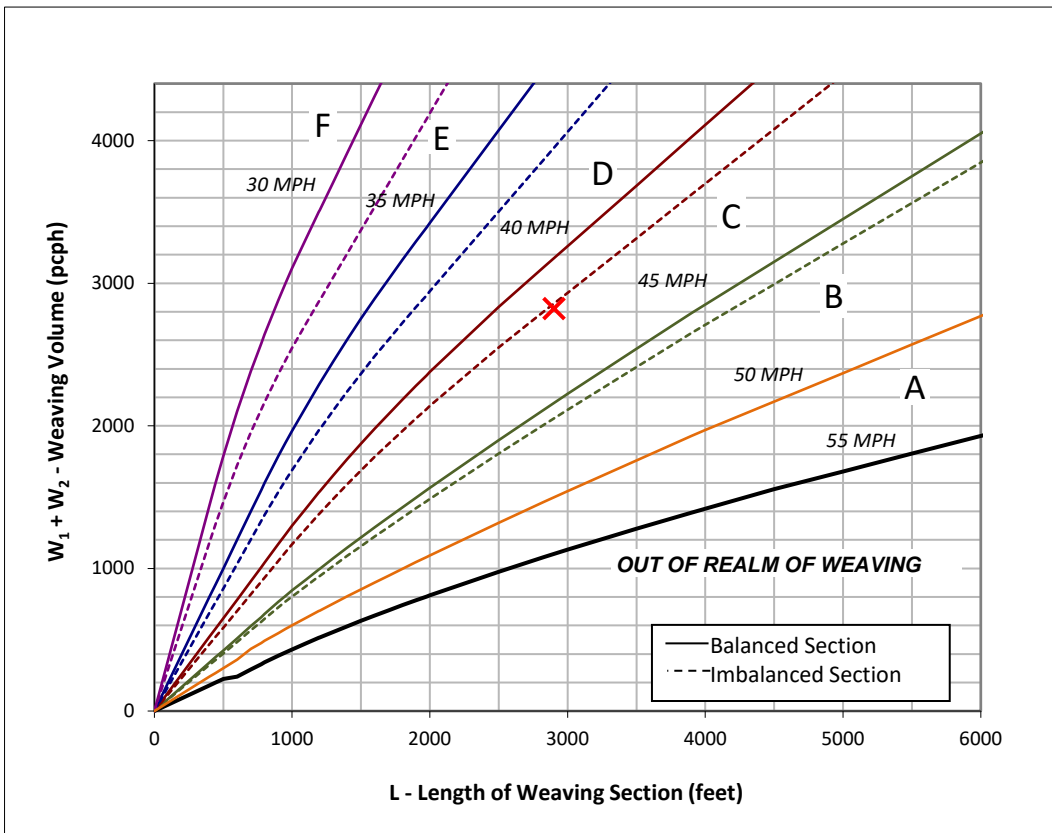
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	5
Length of Weaving Section (feet)	L	2,900

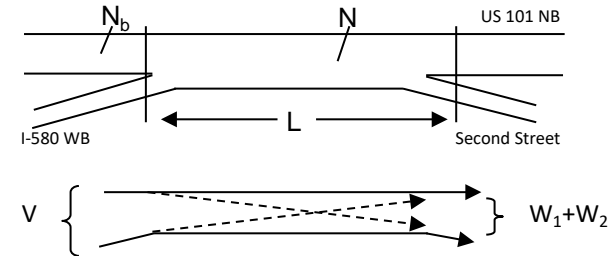
Project Information

Project	BioMarin
Scenario	Existing AM Peak Hour
Freeway	US 101 NB
On-ramp	I-580 WB
Off-ramp	Second Street

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	5,588	1,722	985
Truck Percentage	4%	4%	4%
PCE for Trucks	2.0	2.0	2.0
Volume (pcph)	5,834	1,798	1,025



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? **N**
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
40 MPH and **45 MPH**
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) **40.2**
- Weaving Intensity Factor (k) **2.51**
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ **1,477**
- Level of Service (LOS) **D**

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour
Project Description	BioMarin - US 101 SB Mission Avenue to Second Street		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	4284	Heavy Vehicle Adjustment Factor (f_{HV})	0.919
Peak Hour Factor (PHF)	0.97	Flow Rate ($v_{p,GP}$), pc/h/ln	1602
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.70
Passenger Car Equivalent (E_T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	26.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	998	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.94	Flow Rate ($V_{p,ML}$), pc/h/ln	1104
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.67
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.0
Speed 2 (S_2), mi/h	1.0	Density (D_{ML}), pc/mi/ln	18.7
Speed 2 (S_3), mi/h	5.0	Level of Service (LOS)	C

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour
Project Description	BioMarin - US 101 SB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	-2.44
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	0.77
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	5655	Heavy Vehicle Adjustment Factor (f_{HV})	0.951
Peak Hour Factor (PHF)	0.97	Flow Rate ($v_{p,GP}$), pc/h/ln	2043
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.89
Passenger Car Equivalent (E_T)	2.180		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	56.4
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	36.2
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1317	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.94	Flow Rate ($V_{p,ML}$), pc/h/ln	1440
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (E_T)	2.390		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	1
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	44.8
Speed 2 (S_2), mi/h	3.0	Density (D_{ML}), pc/mi/ln	32.1
Speed 2 (S_3), mi/h	12.2	Level of Service (LOS)	D

HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	3/17/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour
Project Description	BioMarin - US 101 Mission Ave Slip Off-Ramp		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	3	1
Free-Flow Speed (FFS), mi/h	60.0	50.0
Segment Length (L) / Deceleration Length (L _D), ft	1500	170
Terrain Type	Specific Grade	Specific Grade
Percent Grade, %	-2.44	-1.80
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Volume (V _i), veh/h	5655	1371
Peak Hour Factor (PHF)	0.97	0.92
Total Trucks, %	4.40	3.72
Single-Unit Trucks (SUT), %	66	66
Tractor-Trailers (TT), %	34	34
Heavy Vehicle Adjustment Factor (f _{HV})	0.951	0.958
Flow Rate (v _i), pc/h	6130	1556
Capacity (c), pc/h	6900	2100
Volume-to-Capacity Ratio (v/c)	0.89	0.74

Speed and Density

Upstream Equilibrium Distance (L _{EQ}), ft	60532.1	Density in Ramp Influence Area (D _R), pc/mi/ln	37.1
Distance to Upstream Ramp (L _{UP}), ft	10000	Speed Index (D _S)	0.373
Downstream Equilibrium Distance (L _{EQ}), ft	-	Flow Outer Lanes (v _{OA}), pc/h/ln	2127
Distance to Downstream Ramp (L _{DOWN}), ft	10000	Off-Ramp Influence Area Speed (S _R), mi/h	53.3
Prop. Freeway Vehicles in Lane 1 and 2 (P _{FD})	0.535	Outer Lanes Freeway Speed (S _O), mi/h	61.4
Flow in Lanes 1 and 2 (v ₁₂), pc/h	4003	Ramp Junction Speed (S), mi/h	55.9
Flow Entering Ramp-Infl. Area (v _{R12}), pc/h	-	Average Density (D), pc/mi/ln	36.6
Level of Service (LOS)	E		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
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Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44
Managed Lane Adjustment Factors			
Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V _{ML}), veh/h	1317	Heavy Vehicle Adjustment Factor (f _{HV})	0.973
Peak Hour Factor	0.94	Flow Rate (V _{p,ML}), pc/h/ln	1440
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C _{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (E _t)	2.390		
Managed Lane Speed and Density			
Breakpoint (BP _{ML})	501	Indicator Variable	1
Speed 1 (S ₁), mi/h	60.0	Average Speed (S _{ML}), mi/h	44.8
Speed 2 (S ₂), mi/h	3.0	Density (D _{ML}), pc/mi/ln	32.1
Speed 2 (S ₃), mi/h	12.2	Level of Service (LOS)	D

Leisch Method for Weaving Analysis

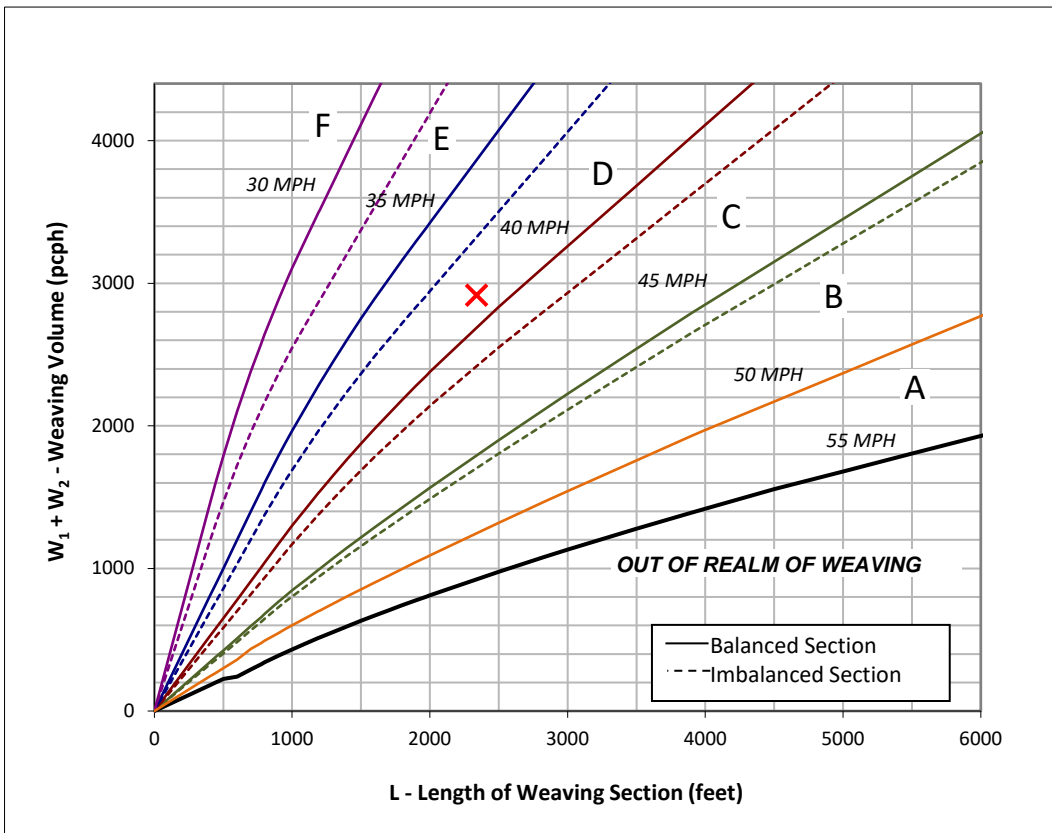
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	2,340

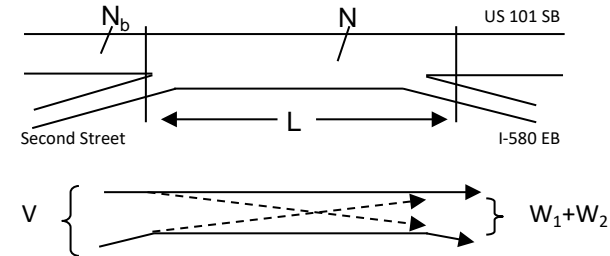
Project Information

Project	BioMarin
Scenario	Existing AM Peak Hour
Freeway	US 101 SB
On-ramp	Second Street
Off-ramp	I-580 EB

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	6,538	1,646	1,156
Truck Percentage	4%	3%	2%
PCE for Trucks	2.0	2.0	4.1
Volume (pcph)	6,826	1,690	1,225



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
35 MPH and 40 MPH
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 39.0
- Weaving Intensity Factor (k) 2.59
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 2,192
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour
Project Description	BioMarin - US 101 NB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	4	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	2.86
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	1.02
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	6782	Heavy Vehicle Adjustment Factor (f_{HV})	0.889
Peak Hour Factor (PHF)	0.98	Flow Rate ($v_{p,GP}$), pc/h/ln	1946
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.85
Passenger Car Equivalent (E_T)	3.840		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	57.8
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	33.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	2.86

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V _{ML}), veh/h	1217	Heavy Vehicle Adjustment Factor (f _{HV})	0.916
Peak Hour Factor	0.99	Flow Rate (V _{p,ML}), pc/h/ln	1342
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c _{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.81
Passenger Car Equivalent (E _t)	5.597		

Managed Lane Speed and Density

Breakpoint (BP _{ML})	501	Indicator Variable	0
Speed 1 (S ₁), mi/h	60.0	Average Speed (S _{ML}), mi/h	57.7
Speed 2 (S ₂), mi/h	2.3	Density (D _{ML}), pc/mi/ln	23.3
Speed 2 (S ₃), mi/h	9.8	Level of Service (LOS)	C

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour
Project Description	BioMarin - US 101 NB Second Street to Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	4725	Heavy Vehicle Adjustment Factor (f_{HV})	0.919
Peak Hour Factor (PHF)	0.98	Flow Rate ($v_{p,GP}$), pc/h/ln	1749
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.76
Passenger Car Equivalent (E_T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	59.6
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	29.3
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V _{ML}), veh/h	848	Heavy Vehicle Adjustment Factor (f _{HV})	0.962
Peak Hour Factor	0.99	Flow Rate (V _{p,ML}), pc/h/ln	890
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c _{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.54
Passenger Car Equivalent (E _t)	3.000		
Managed Lane Speed and Density			
Breakpoint (BP _{ML})	501	Indicator Variable	0
Speed 1 (S ₁), mi/h	60.0	Average Speed (S _{ML}), mi/h	59.7
Speed 2 (S ₂), mi/h	0.3	Density (D _{ML}), pc/mi/ln	14.9
Speed 2 (S ₃), mi/h	2.1	Level of Service (LOS)	B

HCS7 Freeway Weaving Report

Project Information

Analyst	Fehr & Peers	Date	3/18/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour
Project Description	BioMarin - US 101 NB I-580 to Second Street Weave Segment		

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Freeway
Short Length (L _s), ft	2900	Number of Maneuver Lanes (N _{WL}), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LC _{RF}), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LC _{FR}), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LC _{RR}), lc	0
Interchange Density (ID), int/mi	1.33	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Volume (V _i), veh/h	3207	1518	598	1262
Peak Hour Factor (PHF)	0.98	0.96	0.96	0.96
Total Trucks, %	4.40	4.40	2.63	2.63
Heavy Vehicle Adjustment Factor (f _{HV})	0.958	0.958	0.974	0.974
Flow Rate (v _i), pc/h	3416	1651	640	1350
Weaving Flow Rate (v _w), pc/h	3001	Freeway Max Capacity (c _{IFL}), pc/h/ln		2300
Non-Weaving Flow Rate (v _{NW}), pc/h	4056	Density-Based Capacity (c _{NWL}), pc/h/ln		1989
Total Flow Rate (v), pc/h	7057	Demand Flow-Based Capacity (c _{DW}), pc/h		5647
Volume Ratio (VR)	0.425	Weaving Segment Capacity (c _w), veh/h		5410
Minimum Lane Change Rate (LC _{MIN}), lc/h	0	Adjusted Weaving Area Capacity (c _{wa}), veh/h		5410
Maximum Weaving Length (L _{MAX}), ft	6963	Volume-to-Capacity Ratio (v/c)		1.25

Speed and Density

Non-Weaving Vehicle Index (I _{NW})	-	Average Weaving Speed (S _w), mi/h	-
Non-Weaving Lane Change Rate (LC _{NW}), lc/h	-	Average Non-Weaving Speed (S _{NW}), mi/h	-
Weaving Lane Change Rate (LC _w), lc/h	-	Average Speed (S), mi/h	-
Total Lane Change Rate (LC _{All}), lc/h	-	Density (D), pc/mi/ln	-
Weaving Intensity Factor (W)	-	Level of Service (LOS)	F

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Level
Managed Lane Length, ft	5280	Percent Grade, %	-
Managed Lane Adjustment Factors			
Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V_{ML}), veh/h	1182	Heavy Vehicle Adjustment Factor (f_{HV})	0.980
Peak Hour Factor	0.99	Flow Rate ($V_{p,ML}$), pc/h/ln	1218
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.74
Passenger Car Equivalent (E_T)	2.000		
Managed Lane Speed and Density			
Breakpoint (BP_{ML})	501	Indicator Variable	1
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	51.4
Speed 2 (S_2), mi/h	1.5	Density (D_{ML}), pc/mi/ln	23.7
Speed 2 (S_3), mi/h	7.1	Level of Service (LOS)	C

Leisch Method for Weaving Analysis

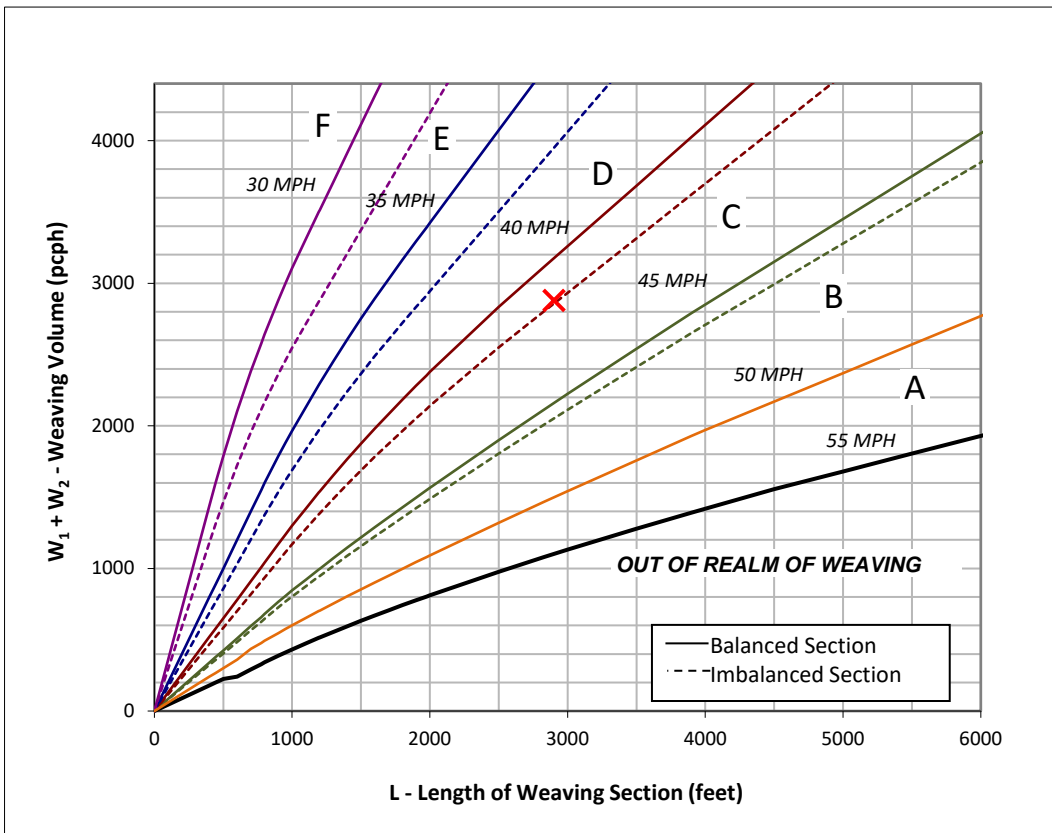
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	5
Length of Weaving Section (feet)	L	2,900

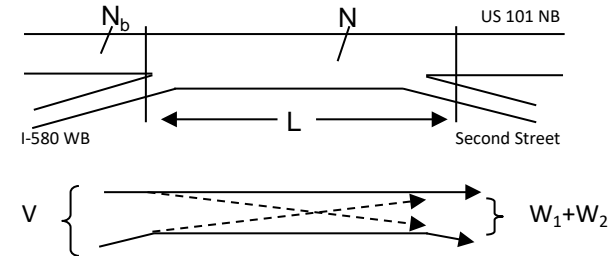
Project Information

Project	BioMarin
Scenario	Existing PM Peak Hour
Freeway	US 101 NB
On-ramp	I-580 WB
Off-ramp	Second Street

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	6,585	1,518	1,262
Truck Percentage	4%	4%	3%
PCE for Trucks	2.0	2.0	2.0
Volume (pcph)	6,875	1,585	1,295



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between? 35 MPH and 40 MPH
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 39.9
- Weaving Intensity Factor (k) 2.53
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,771
- Level of Service (LOS) E

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	6/28/18
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour
Project Description	BioMarin - US 101 SB Mission Avenue to Second Street		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	3297	Heavy Vehicle Adjustment Factor (f_{HV})	0.919
Peak Hour Factor (PHF)	0.97	Flow Rate ($v_{p,GP}$), pc/h/ln	1233
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.54
Passenger Car Equivalent (E_T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	20.6
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	918	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1049
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.64
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.2
Speed 2 (S_2), mi/h	0.8	Density (D_{ML}), pc/mi/ln	17.7
Speed 2 (S_3), mi/h	4.2	Level of Service (LOS)	B

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour
Project Description	BioMarin - US 101 SB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	-2.44
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	0.77
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	4943	Heavy Vehicle Adjustment Factor (f_{HV})	0.951
Peak Hour Factor (PHF)	0.97	Flow Rate ($v_{p,GP}$), pc/h/ln	1786
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.78
Passenger Car Equivalent (E_T)	2.180		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	59.4
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	30.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1377	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1555
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.94
Passenger Car Equivalent (E_T)	2.390		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	56.0
Speed 2 (S_2), mi/h	4.0	Density (D_{ML}), pc/mi/ln	27.8
Speed 2 (S_3), mi/h	15.4	Level of Service (LOS)	D

HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	6/28/18
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour
Project Description	BioMarin - US 101 Mission Ave Slip Off-Ramp		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	3	1
Free-Flow Speed (FFS), mi/h	60.0	50.0
Segment Length (L) / Deceleration Length (L _D), ft	1500	170
Terrain Type	Specific Grade	Specific Grade
Percent Grade, %	-2.44	-1.80
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Volume (V _i), veh/h	4943	1646
Peak Hour Factor (PHF)	0.97	0.96
Total Trucks, %	4.40	2.00
Single-Unit Trucks (SUT), %	66	66
Tractor-Trailers (TT), %	34	34
Heavy Vehicle Adjustment Factor (f _{HV})	0.951	0.973
Flow Rate (v _i), pc/h	5358	1762
Capacity (c), pc/h	6900	2100
Volume-to-Capacity Ratio (v/c)	0.78	0.84

Speed and Density

Upstream Equilibrium Distance (L _{EQ}), ft	94060.4	Density in Ramp Influence Area (D _R), pc/mi/ln	34.7
Distance to Upstream Ramp (L _{UP}), ft	10000	Speed Index (D _S)	0.392
Downstream Equilibrium Distance (L _{EQ}), ft	-	Flow Outer Lanes (v _{OA}), pc/h/ln	1636
Distance to Downstream Ramp (L _{DOWN}), ft	10000	Off-Ramp Influence Area Speed (S _R), mi/h	52.9
Prop. Freeway Vehicles in Lane 1 and 2 (P _{FD})	0.545	Outer Lanes Freeway Speed (S _O), mi/h	63.3
Flow in Lanes 1 and 2 (v ₁₂), pc/h	3722	Ramp Junction Speed (S), mi/h	55.7
Flow Entering Ramp-Infl. Area (v _{R12}), pc/h	-	Average Density (D), pc/mi/ln	32.1
Level of Service (LOS)	D		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
-------------------	-------------------	-----------------------------	------

Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44
Managed Lane Adjustment Factors			
Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V _{ML}), veh/h	1380	Heavy Vehicle Adjustment Factor (f _{HV})	0.973
Peak Hour Factor	0.91	Flow Rate (V _{p,ML}), pc/h/ln	1559
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C _{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.94
Passenger Car Equivalent (E _t)	2.390		
Managed Lane Speed and Density			
Breakpoint (BP _{ML})	501	Indicator Variable	0
Speed 1 (S ₁), mi/h	60.0	Average Speed (S _{ML}), mi/h	55.9
Speed 2 (S ₂), mi/h	4.1	Density (D _{ML}), pc/mi/ln	27.9
Speed 2 (S ₃), mi/h	15.5	Level of Service (LOS)	D

Leisch Method for Weaving Analysis

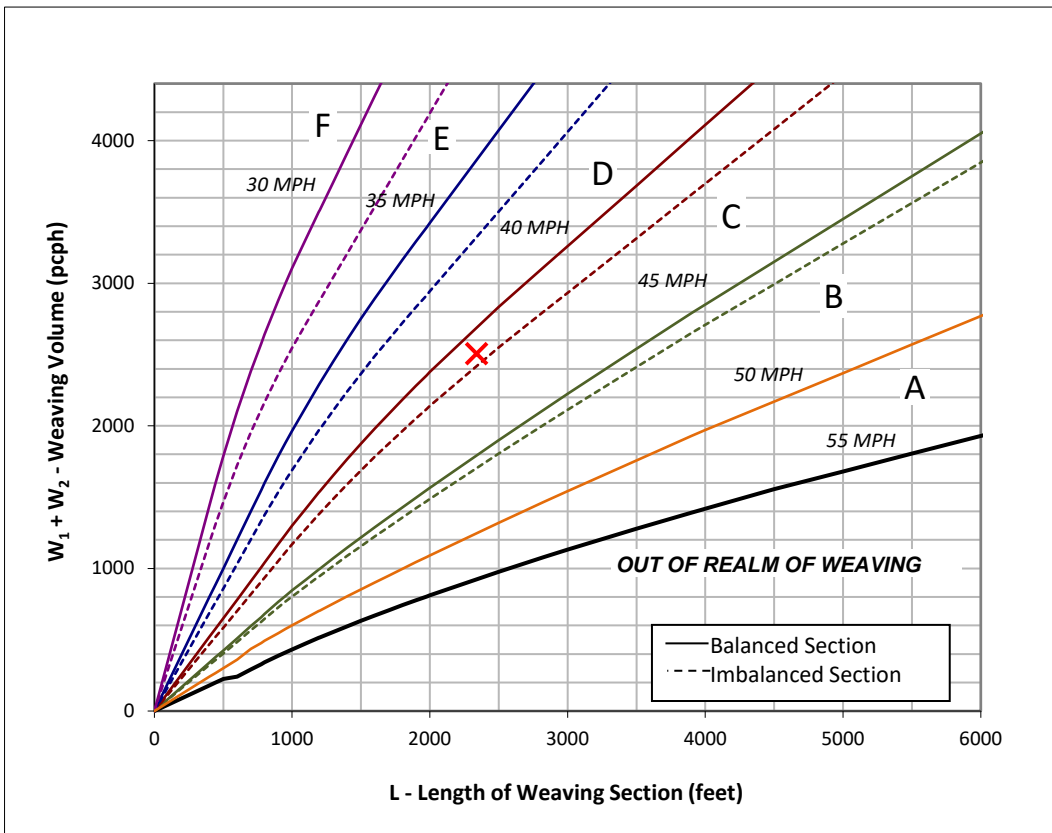
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	2,340

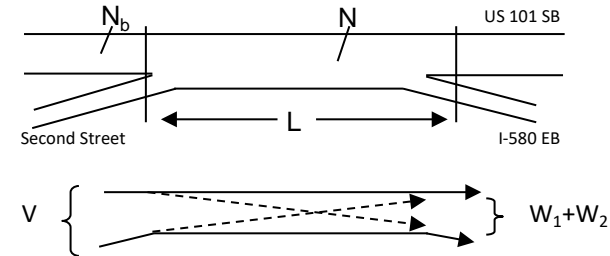
Project Information

Project	BioMarin
Scenario	Existing PM Peak Hour
Freeway	US 101 SB
On-ramp	Second Street
Off-ramp	I-580 EB

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,954	Volume (vph)*	961	Volume (vph)*	1,386
Truck Percentage	4%	Truck Percentage	3%	Truck Percentage	3%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	4.1
Volume (pcph)	5,172	Volume (pcph)	985	Volume (pcph)	1,520



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
40 MPH and 45 MPH
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 41.0
- Weaving Intensity Factor (k) 2.44
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,647
- Level of Service (LOS) E

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

Appendix B: Baseline Conditions – Technical Calculations

Transportation Impact Study




















for BioMarin 999 3rd Street

San Rafael Campus Expansion

January 23, 2019

HCM 2010 Signalized Intersection Summary
1: Lincoln & Mission

Baseline Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	460	20	70	570	50	20	210	40	60	385	360
Future Volume (veh/h)	110	460	20	70	570	50	20	210	40	60	385	360
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	0.99		0.97	0.99		0.94	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1660	1660	1710	1660	1660	1710	1800	1678	1728	1800	1748	1728
Adj Flow Rate, veh/h	120	500	20	76	620	50	22	228	34	65	418	178
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	2	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	148	865	35	372	625	50	73	509	72	146	846	347
Arrive On Green	0.09	0.55	0.55	0.55	0.55	0.55	0.85	0.85	0.85	0.43	0.43	0.43
Sat Flow, veh/h	1581	1582	63	817	1512	122	49	1192	169	208	1983	813
Grp Volume(v), veh/h	120	0	520	76	0	670	284	0	0	358	0	303
Grp Sat Flow(s),veh/h/ln	1581	0	1646	817	0	1634	1410	0	0	1619	0	1385
Q Serve(g_s), s	5.6	0.0	15.7	4.4	0.0	30.5	0.0	0.0	0.0	2.8	0.0	12.1
Cycle Q Clear(g_c), s	5.6	0.0	15.7	10.1	0.0	30.5	3.5	0.0	0.0	11.4	0.0	12.1
Prop In Lane	1.00		0.04	1.00		0.07	0.08		0.12	0.18		0.59
Lane Grp Cap(c), veh/h	148	0	900	372	0	675	654	0	0	747	0	591
V/C Ratio(X)	0.81	0.00	0.58	0.20	0.00	0.99	0.43	0.00	0.00	0.48	0.00	0.51
Avail Cap(c_a), veh/h	148	0	900	372	0	675	654	0	0	747	0	591
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.72	0.00	0.72	0.87	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.4	0.0	11.3	14.0	0.0	16.8	3.4	0.0	0.0	15.5	0.0	15.8
Incr Delay (d2), s/veh	36.9	0.0	2.7	0.9	0.0	27.5	1.8	0.0	0.0	2.2	0.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.0	7.8	1.1	0.0	18.6	1.5	0.0	0.0	5.8	0.0	5.1
LnGrp Delay(d),s/veh	70.3	0.0	14.0	14.9	0.0	44.2	5.2	0.0	0.0	17.7	0.0	18.9
LnGrp LOS	E		B	B		D	A			B		B
Approach Vol, veh/h		640			746			284			661	
Approach Delay, s/veh		24.5			41.2			5.2			18.3	
Approach LOS		C			D			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		45.2		36.8	10.0	35.2		36.8				
Change Period (Y+Rc), s		* 4.2		4.6	3.0	* 4.2		4.6				
Max Green Setting (Gmax), s		* 41		25.4	7.0	* 31		25.4				
Max Q Clear Time (g_c+I1), s		17.7		5.5	7.6	32.5		14.1				
Green Ext Time (p_c), s		5.1		2.4	0.0	0.0		4.5				
Intersection Summary												
HCM 2010 Ctrl Delay			25.8									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis

2: Hetherton & Mission

Baseline Conditions
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑						↑↑	↑
Traffic Volume (vph)	0	490	80	40	220	0	0	0	0	220	970	465
Future Volume (vph)	0	490	80	40	220	0	0	0	0	220	970	465
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	10	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		0.95			1.00						0.95	1.00
Frbp, ped/bikes		0.99			1.00						1.00	0.97
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.98			1.00						1.00	0.85
Flt Protected		1.00			0.99						0.99	1.00
Satd. Flow (prot)		2715			1766						2961	1302
Flt Permitted		1.00			0.86						0.99	1.00
Satd. Flow (perm)		2715			1534						2961	1302
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	533	87	43	239	0	0	0	0	239	1054	505
RTOR Reduction (vph)	0	17	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	603	0	0	282	0	0	0	0	0	1293	505
Confl. Peds. (#/hr)	15		22	22		15			16			1
Confl. Bikes (#/hr)			3			2			1			3
Turn Type		NA		Perm		NA				Split	NA	custom
Protected Phases		4			8					2	2	
Permitted Phases				8								5
Actuated Green, G (s)		32.8			32.8						33.4	26.4
Effective Green, g (s)		32.8			32.8						33.4	26.4
Actuated g/C Ratio		0.44			0.44						0.45	0.35
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		1187			670						1318	458
v/s Ratio Prot		c0.22									c0.44	
v/s Ratio Perm					0.18							c0.39
v/c Ratio		0.51			0.42						0.98	1.10
Uniform Delay, d1		15.3			14.6						20.5	24.3
Progression Factor		0.60			1.45						1.00	1.00
Incremental Delay, d2		1.3			1.6						20.7	72.9
Delay (s)		10.5			22.6						41.1	97.2
Level of Service		B			C						D	F
Approach Delay (s)		10.5			22.6			0.0			56.9	
Approach LOS		B			C			A			E	

Intersection Summary

HCM 2000 Control Delay	42.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

3: Irwin & Mission




















Baseline Conditions
Timing Plan: AM Peak Hour



Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2	
Lane Configurations											
Traffic Volume (vph)	380	20	310	160	320	5	110	1065	130	40	
Future Volume (vph)	380	20	310	160	320	5	110	1065	130	40	
Ideal Flow (vphpl)	2200	1800	2200	2200	2200	1800	2200	2200	1800	2200	
Lane Width	9	12	10	10	9	12	12	12	12	12	
Total Lost time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Lane Util. Factor		1.00	1.00	1.00	1.00			0.95	1.00		
Frbp, ped/bikes		1.00	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		
Frt		1.00	1.00	1.00	0.85			1.00	0.85		
Flt Protected		0.95	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (prot)		1494	1794	1615	1471			3428	1295		
Flt Permitted		0.60	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (perm)		938	1794	1615	1471			3428	1295		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	413	22	337	174	348	5	120	1158	141	43	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	44	0	
Lane Group Flow (vph)	0	435	337	174	353	0	0	1278	140	0	
Confl. Peds. (#/hr)							13			6	
Confl. Bikes (#/hr)					2	2				2	
Parking (#/hr)				0				2			
Turn Type	pm+pt	pm+pt	NA	NA	Prot		Perm	NA	Perm		
Protected Phases	5	5	2	6	6			4			
Permitted Phases	2	2					4			4	
Actuated Green, G (s)		33.8	33.8	18.8	18.8			32.8	32.8		
Effective Green, g (s)		33.8	33.8	18.8	18.8			32.8	32.8		
Actuated g/C Ratio		0.45	0.45	0.25	0.25			0.44	0.44		
Clearance Time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Lane Grp Cap (vph)		502	808	404	368			1499	566		
v/s Ratio Prot		c0.12	0.19	0.11	c0.24						
v/s Ratio Perm		0.27						0.37	0.11		
v/c Ratio		0.87	0.42	0.43	0.96			0.85	0.25		
Uniform Delay, d1		19.1	13.9	23.6	27.7			18.9	13.3		
Progression Factor		0.98	0.94	1.00	1.00			0.75	0.67		
Incremental Delay, d2		14.1	1.2	3.3	37.7			3.0	0.5		
Delay (s)		32.9	14.3	26.9	65.4			17.2	9.4		
Level of Service		C	B	C	E			B	A		
Approach Delay (s)			24.8	52.7				16.2			
Approach LOS			C	D				B			
Intersection Summary											
HCM 2000 Control Delay			25.6							HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.91								
Actuated Cycle Length (s)			75.0							Sum of lost time (s)	12.6
Intersection Capacity Utilization			89.4%							ICU Level of Service	E
Analysis Period (min)			15								
c	Critical Lane Group										

HCM 2010 Signalized Intersection Summary
4: Lincoln & 5th

Baseline Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	300	40	70	280	30	10	220	45	40	395	40
Future Volume (veh/h)	30	300	40	70	280	30	10	220	45	40	395	40
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	0.99		0.94	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1398	1545	1530	1398	1485	1530	1440	1485	1469	1440	1485	1469
Adj Flow Rate, veh/h	33	326	36	76	304	28	11	239	39	43	429	39
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	243	534	59	257	524	48	58	523	83	83	533	47
Arrive On Green	0.39	0.39	0.39	0.13	0.13	0.13	0.97	0.97	0.97	0.97	0.97	0.97
Sat Flow, veh/h	825	1361	150	802	1336	123	16	1077	171	63	1098	96
Grp Volume(v), veh/h	33	0	362	76	0	332	289	0	0	511	0	0
Grp Sat Flow(s),veh/h/ln	825	0	1511	802	0	1459	1264	0	0	1257	0	0
Q Serve(g_s), s	2.6	0.0	14.4	6.9	0.0	16.1	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	18.6	0.0	14.4	21.2	0.0	16.1	0.9	0.0	0.0	4.1	0.0	0.0
Prop In Lane	1.00		0.10	1.00		0.08	0.04		0.13	0.08		0.08
Lane Grp Cap(c), veh/h	243	0	592	257	0	572	663	0	0	662	0	0
V/C Ratio(X)	0.14	0.00	0.61	0.30	0.00	0.58	0.44	0.00	0.00	0.77	0.00	0.00
Avail Cap(c_a), veh/h	243	0	592	257	0	572	663	0	0	662	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.94	0.00	0.94	0.85	0.00	0.00	0.52	0.00	0.00
Uniform Delay (d), s/veh	26.4	0.0	18.2	36.0	0.0	26.8	0.6	0.0	0.0	0.6	0.0	0.0
Incr Delay (d2), s/veh	1.2	0.0	4.6	2.8	0.0	4.0	1.8	0.0	0.0	4.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	6.7	1.7	0.0	7.1	0.6	0.0	0.0	1.3	0.0	0.0
LnGrp Delay(d),s/veh	27.6	0.0	22.9	38.8	0.0	30.9	2.3	0.0	0.0	5.2	0.0	0.0
LnGrp LOS	C		C	D		C	A			A		
Approach Vol, veh/h		395			408			289			511	
Approach Delay, s/veh		23.3			32.3			2.3			5.2	
Approach LOS		C			C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		34.0		41.0		34.0		41.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		29.4		36.4		29.4		36.4				
Max Q Clear Time (g_c+I1), s		20.6		2.9		23.2		6.1				
Green Ext Time (p_c), s		1.2		1.3		1.0		2.5				
Intersection Summary												
HCM 2010 Ctrl Delay			16.0									
HCM 2010 LOS			B									

HCM Signalized Intersection Capacity Analysis

5: Hetherton & 5th


















Baseline Conditions
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔↔↔	↔
Traffic Volume (vph)	0	240	165	40	245	0	0	0	0	50	925	115
Future Volume (vph)	0	240	165	40	245	0	0	0	0	50	925	115
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		1.00			1.00						0.91	1.00
Frbp, ped/bikes		0.99			1.00						1.00	0.95
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.95			1.00						1.00	0.85
Flt Protected		1.00			0.99						1.00	1.00
Satd. Flow (prot)		1665			1769						4117	1127
Flt Permitted		1.00			0.91						1.00	1.00
Satd. Flow (perm)		1665			1612						4117	1127
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	261	179	43	266	0	0	0	0	54	1005	125
RTOR Reduction (vph)	0	28	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	412	0	0	309	0	0	0	0	0	1059	125
Confl. Peds. (#/hr)			15	15		14			22	22		10
Confl. Bikes (#/hr)			4			2			2			2
Parking (#/hr)											2	2
Turn Type		NA		Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases				8						2		5
Actuated Green, G (s)		32.8			32.8						33.4	26.4
Effective Green, g (s)		32.8			32.8						33.4	26.4
Actuated g/C Ratio		0.44			0.44						0.45	0.35
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		728			704						1833	396
v/s Ratio Prot		c0.25										
v/s Ratio Perm					0.19						0.26	0.11
v/c Ratio		0.57			0.44						0.58	0.32
Uniform Delay, d1		15.8			14.7						15.5	17.7
Progression Factor		0.43			1.25						0.18	0.26
Incremental Delay, d2		3.1			1.2						0.5	0.8
Delay (s)		9.8			19.5						3.3	5.3
Level of Service		A			B						A	A
Approach Delay (s)		9.8			19.5			0.0			3.5	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.5		HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			75.0		Sum of lost time (s)			10.8				
Intersection Capacity Utilization			81.6%		ICU Level of Service			D				
Analysis Period (min)			15									
c Critical Lane Group												




















HCM 2010 Signalized Intersection Summary
6: Irwin & 5th

Baseline Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	100	0	0	155	120	155	1115	10	0	0	0
Future Volume (veh/h)	140	100	0	0	155	120	155	1115	10	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.89	0.89	1.00	0.89			
Adj Sat Flow, veh/h/ln	1573	1573	0	0	1573	1620	1620	1573	1620			
Adj Flow Rate, veh/h	152	109	0	0	168	90	168	1212	10			
Adj No. of Lanes	1	1	0	0	1	0	0	2	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	0	3	0			
Cap, veh/h	237	491	0	0	265	142	181	1378	12			
Arrive On Green	0.10	0.10	0.00	0.00	0.31	0.31	0.19	0.19	0.19			
Sat Flow, veh/h	993	1573	0	0	849	455	321	2438	21			
Grp Volume(v), veh/h	152	109	0	0	0	258	725	0	665			
Grp Sat Flow(s),veh/h/ln	993	1573	0	0	0	1304	1384	0	1396			
Q Serve(g_s), s	10.7	4.8	0.0	0.0	0.0	12.7	38.7	0.0	34.5			
Cycle Q Clear(g_c), s	23.4	4.8	0.0	0.0	0.0	12.7	38.7	0.0	34.5			
Prop In Lane	1.00		0.00	0.00		0.35	0.23		0.02			
Lane Grp Cap(c), veh/h	237	491	0	0	0	407	782	0	789			
V/C Ratio(X)	0.64	0.22	0.00	0.00	0.00	0.63	0.93	0.00	0.84			
Avail Cap(c_a), veh/h	237	491	0	0	0	407	782	0	789			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	40.4	25.3	0.0	0.0	0.0	22.1	29.0	0.0	27.3			
Incr Delay (d2), s/veh	12.5	1.0	0.0	0.0	0.0	7.3	18.7	0.0	10.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.0	2.2	0.0	0.0	0.0	5.4	18.9	0.0	15.6			
LnGrp Delay(d),s/veh	52.9	26.3	0.0	0.0	0.0	29.5	47.6	0.0	37.9			
LnGrp LOS	D	C				C	D		D			
Approach Vol, veh/h		261			258			1390				
Approach Delay, s/veh		41.8			29.5			43.0				
Approach LOS		D			C			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		28.0		47.0		28.0						
Change Period (Y+Rc), s		4.6		4.6		4.6						
Max Green Setting (Gmax), s		23.4		42.4		23.4						
Max Q Clear Time (g_c+I1), s		25.4		40.7		14.7						
Green Ext Time (p_c), s		0.0		1.2		0.7						
Intersection Summary												
HCM 2010 Ctrl Delay				41.0								
HCM 2010 LOS				D								

HCM 2010 Signalized Intersection Summary
7: Lincoln & 4th

Baseline Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	260	20	70	310	30	20	225	65	65	365	80
Future Volume (veh/h)	30	260	20	70	310	30	20	225	65	65	365	80
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.92	0.98		0.92	0.97		0.91	0.99		0.91
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1573	1510	1620	1573	1573	1620	1620	1573	1555	1620	1573	1555
Adj Flow Rate, veh/h	33	283	18	76	337	28	22	245	57	71	397	77
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	238	536	34	309	546	45	71	517	115	113	494	91
Arrive On Green	0.38	0.38	0.38	0.13	0.13	0.13	0.17	0.17	0.17	1.00	1.00	1.00
Sat Flow, veh/h	894	1396	89	937	1422	118	40	1027	228	117	980	181
Grp Volume(v), veh/h	33	0	301	76	0	365	324	0	0	545	0	0
Grp Sat Flow(s),veh/h/ln	894	0	1485	937	0	1540	1294	0	0	1278	0	0
Q Serve(g_s), s	2.4	0.0	11.7	5.8	0.0	16.8	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	19.3	0.0	11.7	17.5	0.0	16.8	16.5	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.08	0.07		0.18	0.13		0.14
Lane Grp Cap(c), veh/h	238	0	570	309	0	591	703	0	0	698	0	0
V/C Ratio(X)	0.14	0.00	0.53	0.25	0.00	0.62	0.46	0.00	0.00	0.78	0.00	0.00
Avail Cap(c_a), veh/h	238	0	570	309	0	591	703	0	0	698	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.92	0.00	0.92	0.50	0.00	0.00	0.47	0.00	0.00
Uniform Delay (d), s/veh	27.5	0.0	17.8	33.4	0.0	27.5	22.4	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	1.2	0.0	3.5	1.7	0.0	4.4	1.1	0.0	0.0	4.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	5.3	1.6	0.0	7.9	6.3	0.0	0.0	0.8	0.0	0.0
LnGrp Delay(d),s/veh	28.7	0.0	21.3	35.2	0.0	31.9	23.5	0.0	0.0	4.2	0.0	0.0
LnGrp LOS	C		C	D		C	C			A		
Approach Vol, veh/h		334			441			324			545	
Approach Delay, s/veh		22.1			32.5			23.5			4.2	
Approach LOS		C			C			C			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		33.0		42.0		33.0		42.0				
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2		* 4.2				
Max Green Setting (Gmax), s		* 29		* 38		* 29		* 38				
Max Q Clear Time (g_c+I1), s		21.3		18.5		19.5		2.0				
Green Ext Time (p_c), s		1.6		2.8		2.6		6.6				
Intersection Summary												
HCM 2010 Ctrl Delay				19.2								
HCM 2010 LOS				B								
Notes												

HCM Signalized Intersection Capacity Analysis
 8: 4th & Tamalpais

Baseline Conditions
 Timing Plan: AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↔			↗
Traffic Volume (vph)	0	410	380	35	0	35
Future Volume (vph)	0	410	380	35	0	35
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.6	5.6			5.2
Lane Util. Factor		1.00	1.00			1.00
Frbp, ped/bikes		1.00	0.99			0.87
Flpb, ped/bikes		1.00	1.00			1.00
Frt		1.00	0.99			0.86
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		1573	1540			1188
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		1573	1540			1188
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	446	413	38	0	38
RTOR Reduction (vph)	0	0	4	0	0	32
Lane Group Flow (vph)	0	446	447	0	0	6
Confl. Peds. (#/hr)				39		46
Confl. Bikes (#/hr)				4		
Turn Type		NA	NA			Perm
Protected Phases		2 8	4 6			
Permitted Phases						8
Actuated Green, G (s)		50.7	51.8			12.4
Effective Green, g (s)		50.7	51.8			12.4
Actuated g/C Ratio		0.68	0.69			0.17
Clearance Time (s)						5.2
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)		1063	1063			196
v/s Ratio Prot		c0.28	c0.29			
v/s Ratio Perm						0.01
v/c Ratio		0.42	0.42			0.03
Uniform Delay, d1		5.5	5.1			26.3
Progression Factor		1.63	0.49			1.00
Incremental Delay, d2		0.2	0.2			0.1
Delay (s)		9.2	2.6			26.3
Level of Service		A	A			C
Approach Delay (s)		9.2	2.6		26.3	
Approach LOS		A	A		C	
Intersection Summary						
HCM 2000 Control Delay			6.7		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.48			
Actuated Cycle Length (s)			75.0		Sum of lost time (s)	16.4
Intersection Capacity Utilization			46.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

9: Hetherton & 4th

Baseline Conditions

Timing Plan: AM Peak Hour




















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↖	↑						↑↑↑	↗
Traffic Volume (vph)	0	285	130	185	285	0	0	0	0	105	825	200
Future Volume (vph)	0	285	130	185	285	0	0	0	0	105	825	200
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	13	10	15	11	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Lane Util. Factor		1.00	1.00	1.00	1.00						0.91	1.00
Frbp, ped/bikes		1.00	0.95	1.00	1.00						1.00	0.89
Flpb, ped/bikes		1.00	1.00	0.98	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						0.99	1.00
Satd. Flow (prot)		1625	1180	1606	1520						4262	1185
Flt Permitted		1.00	1.00	0.49	1.00						0.99	1.00
Satd. Flow (perm)		1625	1180	832	1520						4262	1185
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	310	141	201	310	0	0	0	0	114	897	217
RTOR Reduction (vph)	0	0	35	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	310	106	201	310	0	0	0	0	0	1011	217
Confl. Peds. (#/hr)			40	40		22			9	9		30
Confl. Bikes (#/hr)			8			4						2
Turn Type		NA	Perm	Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases			4	8						2		5
Actuated Green, G (s)		32.8	32.8	32.8	32.8						33.4	26.4
Effective Green, g (s)		32.8	32.8	32.8	32.8						33.4	26.4
Actuated g/C Ratio		0.44	0.44	0.44	0.44						0.45	0.35
Clearance Time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		710	516	363	664						1898	417
v/s Ratio Prot		0.19			0.20							
v/s Ratio Perm			0.09	0.24							0.24	0.18
v/c Ratio		0.44	0.21	0.55	0.47						0.53	0.52
Uniform Delay, d1		14.7	13.0	15.7	14.9						15.1	19.3
Progression Factor		0.40	0.23	1.01	1.03						0.35	0.45
Incremental Delay, d2		1.8	0.8	4.4	1.7						0.9	3.8
Delay (s)		7.6	3.8	20.3	17.2						6.2	12.4
Level of Service		A	A	C	B						A	B
Approach Delay (s)		6.4			18.4			0.0			7.3	
Approach LOS		A			B			A			A	

Intersection Summary

HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			















HCM 2010 Signalized Intersection Summary
10: Irwin & 4th

Baseline Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	230	0	0	345	70	130	1080	50	0	0	0
Future Volume (veh/h)	160	230	0	0	345	70	130	1080	50	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.95	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89			
Adj Sat Flow, veh/h/ln	1573	1573	0	0	1573	1620	1510	1573	1620			
Adj Flow Rate, veh/h	174	250	0	0	375	65	141	1174	50			
Adj No. of Lanes	1	1	0	0	1	0	1	2	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	152	604	0	0	443	77	725	1389	59			
Arrive On Green	0.77	0.77	0.00	0.00	0.13	0.13	0.17	0.17	0.17			
Sat Flow, veh/h	842	1573	0	0	1153	200	1438	2755	117			
Grp Volume(v), veh/h	174	250	0	0	0	440	141	636	588			
Grp Sat Flow(s),veh/h/ln	842	1573	0	0	0	1353	1438	1494	1378			
Q Serve(g_s), s	4.9	4.1	0.0	0.0	0.0	23.9	6.3	31.0	31.0			
Cycle Q Clear(g_c), s	28.8	4.1	0.0	0.0	0.0	23.9	6.3	31.0	31.0			
Prop In Lane	1.00		0.00	0.00		0.15	1.00		0.09			
Lane Grp Cap(c), veh/h	152	604	0	0	0	520	725	753	695			
V/C Ratio(X)	1.15	0.41	0.00	0.00	0.00	0.85	0.19	0.85	0.85			
Avail Cap(c_a), veh/h	152	604	0	0	0	520	725	753	695			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33			
Upstream Filter(I)	0.90	0.90	0.00	0.00	0.00	1.00	0.36	0.36	0.36			
Uniform Delay (d), s/veh	22.2	5.8	0.0	0.0	0.0	30.6	18.1	28.4	28.4			
Incr Delay (d2), s/veh	114.7	1.9	0.0	0.0	0.0	15.6	0.2	4.4	4.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	7.9	1.9	0.0	0.0	0.0	11.2	2.6	13.8	12.8			
LnGrp Delay(d),s/veh	136.9	7.7	0.0	0.0	0.0	46.2	18.4	32.8	33.2			
LnGrp LOS	F	A				D	B	C	C			
Approach Vol, veh/h		424			440			1365				
Approach Delay, s/veh		60.7			46.2			31.5				
Approach LOS		E			D			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		33.0		42.0		33.0						
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2						
Max Green Setting (Gmax), s		* 29		* 38		* 29						
Max Q Clear Time (g_c+I1), s		30.8		33.0		25.9						
Green Ext Time (p_c), s		0.0		2.8		0.6						
Intersection Summary												
HCM 2010 Ctrl Delay				39.9								
HCM 2010 LOS				D								
Notes												













HCM 2010 Signalized Intersection Summary
 11: D & 3rd

Baseline Conditions
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	295	1135	0	0	0	0	0	230	30
Future Volume (veh/h)	0	0	0	295	1135	0	0	0	0	0	230	30
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1530	1485	0				0	1485	1530
Adj Flow Rate, veh/h				321	1234	0				0	250	18
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				502	1718	0				0	786	56
Arrive On Green				0.19	0.19	0.00				0.00	0.31	0.31
Sat Flow, veh/h				747	3133	0				0	2593	180
Grp Volume(v), veh/h				558	997	0				0	139	129
Grp Sat Flow(s),veh/h/ln				1299	1230	0				0	1411	1288
Q Serve(g_s), s				30.5	28.5	0.0				0.0	5.6	5.7
Cycle Q Clear(g_c), s				30.5	28.5	0.0				0.0	5.6	5.7
Prop In Lane				0.58		0.00				0.00		0.14
Lane Grp Cap(c), veh/h				817	1404	0				0	440	402
V/C Ratio(X)				0.68	0.71	0.00				0.00	0.32	0.32
Avail Cap(c_a), veh/h				817	1404	0				0	440	402
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				25.4	24.6	0.0				0.0	19.7	19.7
Incr Delay (d2), s/veh				4.6	3.1	0.0				0.0	1.9	2.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				12.0	10.3	0.0				0.0	2.4	2.3
LnGrp Delay(d),s/veh				30.0	27.7	0.0				0.0	21.6	21.8
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1555						268	
Approach Delay, s/veh					28.5						21.7	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		47.0		28.0								
Change Period (Y+Rc), s		* 4.2		4.6								
Max Green Setting (Gmax), s		* 43		23.4								
Max Q Clear Time (g_c+I1), s		32.5		7.7								
Green Ext Time (p_c), s		5.7		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay				27.5								
HCM 2010 LOS				C								
Notes												


















HCM 2010 Signalized Intersection Summary
12: C & 3rd

Baseline Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑		↑↑				
Traffic Volume (veh/h)	0	0	0	0	1315	110	100	235	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1315	110	100	235	0	0	0	0
Number				5	2	12	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.98	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1398	1398	1440	1398	0			
Adj Flow Rate, veh/h				0	1429	82	109	255	0			
Adj No. of Lanes				0	3	1	0	2	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	3	3	3	3	0			
Cap, veh/h				0	2229	679	266	553	0			
Arrive On Green				0.00	0.19	0.19	0.10	0.10	0.00			
Sat Flow, veh/h				0	3943	1163	630	1883	0			
Grp Volume(v), veh/h				0	1429	82	197	167	0			
Grp Sat Flow(s),veh/h/ln				0	1272	1163	1241	1209	0			
Q Serve(g_s), s				0.0	25.9	4.4	9.6	9.7	0.0			
Cycle Q Clear(g_c), s				0.0	25.9	4.4	11.2	9.7	0.0			
Prop In Lane				0.00		1.00	0.55		0.00			
Lane Grp Cap(c), veh/h				0	2229	679	452	367	0			
V/C Ratio(X)				0.00	0.64	0.12	0.44	0.45	0.00			
Avail Cap(c_a), veh/h				0	2229	679	452	367	0			
HCM Platoon Ratio				1.00	0.33	0.33	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	23.0	14.4	28.4	27.9	0.0			
Incr Delay (d2), s/veh				0.0	1.4	0.4	3.1	4.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	9.4	1.5	4.3	3.7	0.0			
LnGrp Delay(d),s/veh				0.0	24.5	14.7	31.5	31.9	0.0			
LnGrp LOS					C	B	C	C				
Approach Vol, veh/h					1511			364				
Approach Delay, s/veh					23.9			31.7				
Approach LOS					C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		48.0		27.0								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 44		* 23								
Max Q Clear Time (g_c+I1), s		27.9		13.2								
Green Ext Time (p_c), s		7.6		1.0								
Intersection Summary												
HCM 2010 Ctrl Delay				25.4								
HCM 2010 LOS				C								
Notes												

















HCM 2010 Signalized Intersection Summary
13: B & 3rd

Baseline Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  						 	
Traffic Volume (veh/h)	0	0	0	90	1370	0	0	0	0	0	190	50
Future Volume (veh/h)	0	0	0	90	1370	0	0	0	0	0	190	50
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.87
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1440	1398	0				0	1398	1440
Adj Flow Rate, veh/h				98	1489	0				0	207	25
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				167	2129	0				0	616	72
Arrive On Green				0.20	0.20	0.00				0.00	0.28	0.28
Sat Flow, veh/h				182	3601	0				0	2290	261
Grp Volume(v), veh/h				589	998	0				0	122	110
Grp Sat Flow(s),veh/h/ln				1353	1158	0				0	1328	1153
Q Serve(g_s), s				21.8	30.1	0.0				0.0	5.5	5.7
Cycle Q Clear(g_c), s				30.3	30.1	0.0				0.0	5.5	5.7
Prop In Lane				0.17		0.00				0.00		0.23
Lane Grp Cap(c), veh/h				882	1414	0				0	368	320
V/C Ratio(X)				0.67	0.71	0.00				0.00	0.33	0.34
Avail Cap(c_a), veh/h				882	1414	0				0	368	320
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				23.7	23.7	0.0				0.0	21.6	21.7
Incr Delay (d2), s/veh				4.0	3.0	0.0				0.0	2.4	2.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				12.4	10.2	0.0				0.0	2.2	2.1
LnGrp Delay(d),s/veh				27.7	26.6	0.0				0.0	24.0	24.6
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1587						232	
Approach Delay, s/veh					27.0						24.3	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		50.0		25.0								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 46		* 21								
Max Q Clear Time (g_c+I1), s		32.3		7.7								
Green Ext Time (p_c), s		6.9		0.7								
Intersection Summary												
HCM 2010 Ctrl Delay				26.7								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary
14: A & 3rd

Baseline Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	40	1225	80	195	120	0	0	130	30
Future Volume (veh/h)	0	0	0	40	1225	80	195	120	0	0	130	30
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	0.97		1.00	1.00		0.93
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1800	1748	1800	1835	1835	0	0	1835	1890
Adj Flow Rate, veh/h				43	1332	77	212	130	0	0	141	21
Adj No. of Lanes				0	3	0	1	1	0	0	1	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	3	0	3	3	0	0	3	3
Cap, veh/h				72	2356	141	371	685	0	0	358	53
Arrive On Green				0.17	0.17	0.17	0.02	0.12	0.00	0.00	0.26	0.26
Sat Flow, veh/h				140	4590	275	1748	1835	0	0	1375	205
Grp Volume(v), veh/h				537	446	469	212	130	0	0	0	162
Grp Sat Flow(s),veh/h/ln				1741	1590	1674	1748	1835	0	0	0	1580
Q Serve(g_s), s				21.4	19.3	19.3	0.0	4.8	0.0	0.0	0.0	6.3
Cycle Q Clear(g_c), s				21.4	19.3	19.3	0.0	4.8	0.0	0.0	0.0	6.3
Prop In Lane				0.08		0.16	1.00		0.00	0.00		0.13
Lane Grp Cap(c), veh/h				894	816	859	371	685	0	0	0	411
V/C Ratio(X)				0.60	0.55	0.55	0.57	0.19	0.00	0.00	0.00	0.39
Avail Cap(c_a), veh/h				894	816	859	371	685	0	0	0	411
HCM Platoon Ratio				0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				24.0	23.2	23.2	30.1	22.7	0.0	0.0	0.0	22.9
Incr Delay (d2), s/veh				3.0	2.6	2.5	6.2	0.6	0.0	0.0	0.0	2.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.0	9.1	9.5	5.0	2.5	0.0	0.0	0.0	3.1
LnGrp Delay(d),s/veh				27.0	25.8	25.6	36.3	23.3	0.0	0.0	0.0	25.7
LnGrp LOS				C	C	C	D	C				C
Approach Vol, veh/h					1452			342			162	
Approach Delay, s/veh					26.2			31.4			25.7	
Approach LOS					C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			8.0	24.0		43.0		32.0				
Change Period (Y+Rc), s			4.0	4.5		4.5		4.0				
Max Green Setting (Gmax), s			4.0	19.5		38.5		28.0				
Max Q Clear Time (g_c+I1), s			2.0	8.3		23.4		6.8				
Green Ext Time (p_c), s			0.3	0.8		10.6		0.9				
Intersection Summary												
HCM 2010 Ctrl Delay				27.1								
HCM 2010 LOS				C								

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

BioMarin
Baseline Conditions
AM Peak Hour

Intersection 15 Brooks St/3rd St Side-street Stop
















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	20	17	82.8%	14.4	4.8	B
	Through						
	Right Turn						
	Subtotal	20	17	82.8%	14.4	4.8	B
SB	Left Turn						
	Through						
	Right Turn	5	5	95.7%	18.1	15.5	C
	Subtotal	5	5	95.7%	18.1	15.5	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	30	26	87.1%	1.8	0.7	A
	Through	1,320	1,283	97.2%	1.7	0.3	A
	Right Turn	5	4	81.0%	0.7	1.1	A
	Subtotal	1,355	1,313	96.9%	1.7	0.3	A
Total		1,380	1,335	96.7%	1.9	0.3	A

Intersection 16 Lindero St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	80	62	77.3%	15.1	5.2	B
	Through	10	9	92.0%	8.9	9.4	A
	Right Turn						
	Subtotal	90	71	78.9%	14.4	5.1	B
SB	Left Turn						
	Through	40	40	99.4%	20.9	12.0	C
	Right Turn	10	7	69.9%	8.6	12.7	A
	Subtotal	50	47	93.5%	19.1	10.7	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	315	302	95.8%	6.8	0.7	A
	Through	1,280	1,262	98.6%	4.8	0.5	A
	Right Turn	30	36	121.4%	4.6	1.1	A
	Subtotal	1,625	1,600	98.5%	5.1	0.4	A
Total		1,765	1,718	97.3%	5.9	0.7	A

HCM 2010 Signalized Intersection Summary
17: Lincoln & 3rd



















Baseline Conditions
Timing Plan: AM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	0	0	0	160	1515	55	30	195	0	0	280	160	
Future Volume (veh/h)	0	0	0	160	1515	55	30	195	0	0	280	160	
Number				1	6	16	7	4	14	3	8	18	
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)				1.00		0.92	1.00		1.00	1.00		0.91	
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	
Adj Sat Flow, veh/h/ln				1620	1573	1620	1620	1573	0	0	1510	1555	
Adj Flow Rate, veh/h				174	1647	56	33	212	0	0	304	164	
Adj No. of Lanes				0	3	0	0	1	0	0	1	0	
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %				0	3	0	3	3	0	0	3	3	
Cap, veh/h				218	2205	77	54	219	0	0	257	139	
Arrive On Green				0.18	0.18	0.18	0.11	0.11	0.00	0.00	0.11	0.11	
Sat Flow, veh/h				394	3985	139	0	669	0	0	786	424	
Grp Volume(v), veh/h				686	574	617	245	0	0	0	0	468	
Grp Sat Flow(s),veh/h/ln				1553	1431	1534	669	0	0	0	0	1210	
Q Serve(g_s), s				31.7	28.4	28.4	0.0	0.0	0.0	0.0	0.0	24.5	
Cycle Q Clear(g_c), s				31.7	28.4	28.4	24.5	0.0	0.0	0.0	0.0	24.5	
Prop In Lane				0.25		0.09	0.13		0.00	0.00		0.35	
Lane Grp Cap(c), veh/h				859	792	849	273	0	0	0	0	395	
V/C Ratio(X)				0.80	0.73	0.73	0.90	0.00	0.00	0.00	0.00	1.18	
Avail Cap(c_a), veh/h				859	792	849	273	0	0	0	0	395	
HCM Platoon Ratio				0.33	0.33	0.33	0.33	0.33	1.00	1.00	0.33	0.33	
Upstream Filter(I)				1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00	
Uniform Delay (d), s/veh				26.6	25.3	25.3	28.5	0.0	0.0	0.0	0.0	33.5	
Incr Delay (d2), s/veh				7.6	5.7	5.4	33.5	0.0	0.0	0.0	0.0	105.7	
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln				15.5	12.5	13.3	7.6	0.0	0.0	0.0	0.0	19.8	
LnGrp Delay(d),s/veh				34.3	31.0	30.7	62.0	0.0	0.0	0.0	0.0	139.1	
LnGrp LOS				C	C	C	E					F	
Approach Vol, veh/h					1877			245			468		
Approach Delay, s/veh					32.1			62.0			139.1		
Approach LOS					C			E			F		
Timer	1	2	3	4	5	6	7	8					
Assigned Phs				4		6		8					
Phs Duration (G+Y+Rc), s				29.0		46.0		29.0					
Change Period (Y+Rc), s				4.5		4.5		4.5					
Max Green Setting (Gmax), s				24.5		41.5		24.5					
Max Q Clear Time (g_c+I1), s				26.5		33.7		26.5					
Green Ext Time (p_c), s				0.0		5.2		0.0					
Intersection Summary													
HCM 2010 Ctrl Delay				54.3									
HCM 2010 LOS				D									

HCM Signalized Intersection Capacity Analysis


















18: Tamalpais & 3rd

01/21/2019

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					  								
Traffic Volume (vph)	0	0	0	235	1655	20	50	50	0	0	50	10	
Future Volume (vph)	0	0	0	235	1655	20	50	50	0	0	50	10	
Ideal Flow (vphpl)	1800	1800	1800	1600	1600	1600	1600	1600	1800	1800	1600	1600	
Lane Width	12	12	12	12	12	12	11	12	12	12	12	12	
Total Lost time (s)					11.6		7.6	7.6			7.6		
Lane Util. Factor					0.91		1.00	1.00			1.00		
Frbp, ped/bikes					1.00		1.00	1.00			0.99		
Flpb, ped/bikes					0.98		0.93	1.00			1.00		
Frt					1.00		1.00	1.00			0.98		
Flt Protected					0.99		0.95	1.00			1.00		
Satd. Flow (prot)					3707		1060	1237			1191		
Flt Permitted					0.99		0.71	1.00			1.00		
Satd. Flow (perm)					3707		797	1237			1191		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	255	1799	22	54	54	0	0	54	11	
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	8	0	
Lane Group Flow (vph)	0	0	0	0	2075	0	54	54	0	0	57	0	
Confl. Peds. (#/hr)			73	73		38	49		63			49	
Confl. Bikes (#/hr)						2			2			2	
Parking (#/hr)							3	3			3	3	
Turn Type				Perm	NA		Perm	NA			NA		
Protected Phases					6			4			8		
Permitted Phases				6			4						
Actuated Green, G (s)					51.5		19.3	19.3			19.3		
Effective Green, g (s)					51.5		19.3	19.3			19.3		
Actuated g/C Ratio					0.57		0.21	0.21			0.21		
Clearance Time (s)					11.6		7.6	7.6			7.6		
Lane Grp Cap (vph)					2121		170	265			255		
v/s Ratio Prot								0.04			0.05		
v/s Ratio Perm					0.56		c0.07						
v/c Ratio					0.98		0.32	0.20			0.22		
Uniform Delay, d1					18.7		29.8	29.0			29.2		
Progression Factor					1.00		1.00	1.00			1.00		
Incremental Delay, d2					15.0		4.9	1.7			2.0		
Delay (s)					33.7		34.7	30.8			31.2		
Level of Service					C		C	C			C		
Approach Delay (s)		0.0			33.7			32.7			31.2		
Approach LOS		A			C			C			C		
Intersection Summary													
HCM 2000 Control Delay			33.6		HCM 2000 Level of Service						C		
HCM 2000 Volume to Capacity ratio			0.80										
Actuated Cycle Length (s)			90.0		Sum of lost time (s)					19.2			
Intersection Capacity Utilization			141.9%		ICU Level of Service					H			
Analysis Period (min)			15										
c Critical Lane Group													













HCM 2010 Signalized Intersection Summary
 19: Hetherton & 3rd

01/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	420	1465	0	0	0	0	0	750	390
Future Volume (veh/h)	0	0	0	420	1465	0	0	0	0	0	750	390
Number				1	6	16				3	8	18
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.83
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1545	1573	0				0	1573	1485
Adj Flow Rate, veh/h				457	1592	0				0	815	414
Adj No. of Lanes				1	3	0				0	3	1
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				763	2139	0				0	1832	446
Arrive On Green				0.15	0.15	0.00				0.00	0.14	0.14
Sat Flow, veh/h				1471	4718	0				0	4435	1045
Grp Volume(v), veh/h				457	1592	0				0	815	414
Grp Sat Flow(s),veh/h/ln				1471	1573	0				0	1431	1045
Q Serve(g_s), s				22.1	24.2	0.0				0.0	13.0	29.4
Cycle Q Clear(g_c), s				22.1	24.2	0.0				0.0	13.0	29.4
Prop In Lane				1.00		0.00				0.00		1.00
Lane Grp Cap(c), veh/h				763	2139	0				0	1832	446
V/C Ratio(X)				0.60	0.74	0.00				0.00	0.44	0.93
Avail Cap(c_a), veh/h				763	2139	0				0	1832	446
HCM Platoon Ratio				0.33	0.33	1.00				1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				26.8	27.7	0.0				0.0	24.1	31.1
Incr Delay (d2), s/veh				3.5	2.4	0.0				0.0	0.8	28.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				9.7	11.0	0.0				0.0	5.3	12.0
LnGrp Delay(d),s/veh				30.3	30.1	0.0				0.0	24.9	59.1
LnGrp LOS				C	C						C	E
Approach Vol, veh/h					2049						1229	
Approach Delay, s/veh					30.2						36.4	
Approach LOS					C						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs						6		8				
Phs Duration (G+Y+Rc), s						38.0		37.0				
Change Period (Y+Rc), s						4.0		5.0				
Max Green Setting (Gmax), s						34.0		32.0				
Max Q Clear Time (g_c+I1), s						26.2		31.4				
Green Ext Time (p_c), s						5.8		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay					32.5							
HCM 2010 LOS					C							
Notes												
User approved volume balancing among the lanes for turning movement.												



















HCM 2010 Signalized Intersection Summary
20: Irwin & 3rd/3rd St

Baseline Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑	↑	↑↑↑				
Traffic Volume (veh/h)	0	0	0	0	1020	120	875	1145	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1020	120	875	1145	0	0	0	0
Number				1	6	16	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.94	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1485	1485	1398	1398	0			
Adj Flow Rate, veh/h				0	1109	98	960	1232	0			
Adj No. of Lanes				0	3	1	2	2	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	3	3	3	3	0			
Cap, veh/h				0	1379	403	1438	1510	0			
Arrive On Green				0.00	0.34	0.34	0.18	0.18	0.00			
Sat Flow, veh/h				0	4189	1186	2663	2796	0			
Grp Volume(v), veh/h				0	1109	98	960	1232	0			
Grp Sat Flow(s),veh/h/ln				0	1352	1186	1331	1398	0			
Q Serve(g_s), s				0.0	18.6	4.5	25.2	31.8	0.0			
Cycle Q Clear(g_c), s				0.0	18.6	4.5	25.2	31.8	0.0			
Prop In Lane				0.00		1.00	1.00		0.00			
Lane Grp Cap(c), veh/h				0	1379	403	1438	1510	0			
V/C Ratio(X)				0.00	0.80	0.24	0.67	0.82	0.00			
Avail Cap(c_a), veh/h				0	1379	403	1438	1510	0			
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	22.5	17.8	24.5	27.2	0.0			
Incr Delay (d2), s/veh				0.0	5.1	1.4	2.5	5.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	7.5	1.6	9.8	13.4	0.0			
LnGrp Delay(d),s/veh				0.0	27.6	19.2	27.0	32.2	0.0			
LnGrp LOS					C	B	C	C				
Approach Vol, veh/h					1207			2192				
Approach Delay, s/veh					26.9			29.9				
Approach LOS					C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				45.0		30.0						
Change Period (Y+Rc), s				4.5		4.5						
Max Green Setting (Gmax), s				40.5		25.5						
Max Q Clear Time (g_c+I1), s				33.8		20.6						
Green Ext Time (p_c), s				5.3		2.7						
Intersection Summary												
HCM 2010 Ctrl Delay				28.9								
HCM 2010 LOS				C								
Notes												













HCM 2010 Signalized Intersection Summary
21: D & 2nd

Baseline Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  										
Traffic Volume (veh/h)	0	1920	80	0	0	0	0	0	255	70	450	0
Future Volume (veh/h)	0	1920	80	0	0	0	0	0	255	70	450	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1660	1710				0	1573	1620	1748	1748	0
Adj Flow Rate, veh/h	0	2087	80				0	0	261	76	489	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	0	0	0				0	0	1126	1125	1488	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.85	0.28	0.28	0.00
Sat Flow, veh/h		0					0	0	1323	1095	1748	0
Grp Volume(v), veh/h		0.0					0	0	261	76	489	0
Grp Sat Flow(s),veh/h/ln							0	0	1323	1095	1748	0
Q Serve(g_s), s							0.0	0.0	1.1	1.6	6.9	0.0
Cycle Q Clear(g_c), s							0.0	0.0	1.1	2.7	6.9	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	1126	1125	1488	0
V/C Ratio(X)							0.00	0.00	0.23	0.07	0.33	0.00
Avail Cap(c_a), veh/h							0	0	1126	1125	1488	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh							0.0	0.0	0.4	3.1	4.1	0.0
Incr Delay (d2), s/veh							0.0	0.0	0.5	0.1	0.6	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	0.5	0.5	3.6	0.0
LnGrp Delay(d),s/veh							0.0	0.0	0.9	3.2	4.7	0.0
LnGrp LOS									A	A	A	
Approach Vol, veh/h								261			565	
Approach Delay, s/veh								0.9			4.5	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				31.0				31.0				
Change Period (Y+Rc), s				4.6				4.6				
Max Green Setting (Gmax), s				26.4				26.4				
Max Q Clear Time (g_c+I1), s				8.9				3.1				
Green Ext Time (p_c), s				1.4				0.7				
Intersection Summary												
HCM 2010 Ctrl Delay			3.4									
HCM 2010 LOS			A									













HCM 2010 Signalized Intersection Summary
22: C & 2nd

Baseline Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑↑				
Traffic Volume (veh/h)	110	2135	0	0	0	0	0	200	90	0	0	0
Future Volume (veh/h)	110	2135	0	0	0	0	0	200	90	0	0	0
Number	1	6	16				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1440	1485	0				0	1485	1440			
Adj Flow Rate, veh/h	120	2321	0				0	217	94			
Adj No. of Lanes	0	3	0				0	2	0			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0				0	3	3			
Cap, veh/h	159	2405	0				0	549	228			
Arrive On Green	0.20	0.20	0.00				0.00	0.28	0.28			
Sat Flow, veh/h	172	3974	0				0	1978	823			
Grp Volume(v), veh/h	861	1580	0				0	161	150			
Grp Sat Flow(s),veh/h/ln	1442	1352	0				0	1485	1315			
Q Serve(g_s), s	38.3	43.4	0.0				0.0	6.6	7.0			
Cycle Q Clear(g_c), s	44.6	43.4	0.0				0.0	6.6	7.0			
Prop In Lane	0.14		0.00				0.00		0.63			
Lane Grp Cap(c), veh/h	928	1637	0				0	412	365			
V/C Ratio(X)	0.93	0.97	0.00				0.00	0.39	0.41			
Avail Cap(c_a), veh/h	928	1637	0				0	412	365			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	29.6	29.2	0.0				0.0	22.0	22.1			
Incr Delay (d2), s/veh	16.6	15.4	0.0				0.0	2.8	3.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	22.1	19.7	0.0				0.0	3.0	2.9			
LnGrp Delay(d),s/veh	46.2	44.6	0.0				0.0	24.7	25.5			
LnGrp LOS	D	D						C	C			
Approach Vol, veh/h		2441						311				
Approach Delay, s/veh		45.2						25.1				
Approach LOS		D						C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				25.0		50.0						
Change Period (Y+Rc), s				* 4.2		4.6						
Max Green Setting (Gmax), s				* 21		45.4						
Max Q Clear Time (g_c+I1), s				9.0		46.6						
Green Ext Time (p_c), s				1.9		0.0						
Intersection Summary												
HCM 2010 Ctrl Delay			42.9									
HCM 2010 LOS			D									
Notes												






















HCM 2010 Signalized Intersection Summary
23: B & 2nd

Baseline Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑		↑	↑	
Traffic Volume (veh/h)	0	2150	70	0	0	0	0	0	160	70	220	0
Future Volume (veh/h)	0	2150	70	0	0	0	0	0	160	70	220	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1485	1382				0	1573	1591	1545	1485	0
Adj Flow Rate, veh/h	0	2337	71				0	0	157	76	239	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	0	0	0				0	0	1077	1127	1238	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.83	0.28	0.28	0.00
Sat Flow, veh/h		0					0	0	1292	1061	1485	0
Grp Volume(v), veh/h		0.0					0	0	157	76	239	0
Grp Sat Flow(s),veh/h/ln							0	0	1292	1061	1485	0
Q Serve(g_s), s							0.0	0.0	0.6	1.5	3.3	0.0
Cycle Q Clear(g_c), s							0.0	0.0	0.6	2.1	3.3	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	1077	1127	1238	0
V/C Ratio(X)							0.00	0.00	0.15	0.07	0.19	0.00
Avail Cap(c_a), veh/h							0	0	1077	1127	1238	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh							0.0	0.0	0.4	2.6	2.8	0.0
Incr Delay (d2), s/veh							0.0	0.0	0.3	0.1	0.3	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	0.3	0.5	1.5	0.0
LnGrp Delay(d),s/veh							0.0	0.0	0.7	2.7	3.2	0.0
LnGrp LOS										A	A	A
Approach Vol, veh/h								157			315	
Approach Delay, s/veh								0.7			3.1	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				27.0				27.0				
Change Period (Y+Rc), s				4.5				4.5				
Max Green Setting (Gmax), s				22.5				22.5				
Max Q Clear Time (g_c+I1), s				5.3				2.6				
Green Ext Time (p_c), s				0.7				0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			2.3									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary
24: A & 2nd

Baseline Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						 		 		
Traffic Volume (veh/h)	90	2085	195	0	0	0	0	240	20	50	115	0
Future Volume (veh/h)	90	2085	195	0	0	0	0	240	20	50	115	0
Number	5	2	12				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96				1.00		0.96	0.98		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1748	1800				0	1660	1710	1660	1660	0
Adj Flow Rate, veh/h	98	2266	197				0	261	12	54	125	0
Adj No. of Lanes	0	3	0				0	2	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	102	2492	220				0	685	31	285	530	0
Arrive On Green	0.19	0.19	0.19				0.00	0.22	0.22	0.01	0.11	0.00
Sat Flow, veh/h	181	4419	390				0	3149	140	1581	1660	0
Grp Volume(v), veh/h	941	781	839				0	134	139	54	125	0
Grp Sat Flow(s),veh/h/ln	1739	1590	1662				0	1577	1629	1581	1660	0
Q Serve(g_s), s	40.3	35.9	37.1				0.0	5.4	5.5	0.0	5.2	0.0
Cycle Q Clear(g_c), s	40.3	35.9	37.1				0.0	5.4	5.5	0.0	5.2	0.0
Prop In Lane	0.10		0.23				0.00		0.09	1.00		0.00
Lane Grp Cap(c), veh/h	980	897	937				0	352	364	285	530	0
V/C Ratio(X)	0.96	0.87	0.90				0.00	0.38	0.38	0.19	0.24	0.00
Avail Cap(c_a), veh/h	980	897	937				0	352	364	285	530	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.8	27.9	28.4				0.0	24.8	24.8	28.6	25.2	0.0
Incr Delay (d2), s/veh	20.5	11.3	13.0				0.0	3.1	3.0	1.5	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	25.0	18.6	20.4				0.0	2.6	2.7	1.1	2.5	0.0
LnGrp Delay(d),s/veh	50.3	39.3	41.4				0.0	27.9	27.8	30.0	26.3	0.0
LnGrp LOS	D	D	D					C	C	C	C	
Approach Vol, veh/h		2561						273			179	
Approach Delay, s/veh		44.0						27.8			27.4	
Approach LOS		D						C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		47.0		28.2			7.2	21.0				
Change Period (Y+Rc), s		4.6		* 4.2			* 4.2	* 4.2				
Max Green Setting (Gmax), s		42.4		* 24			* 3	* 17				
Max Q Clear Time (g_c+I1), s		42.3		7.2			2.0	7.5				
Green Ext Time (p_c), s		0.1		0.7			0.0	1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			41.6									
HCM 2010 LOS			D									
Notes												

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

BioMarin
Baseline Conditions
AM Peak Hour

Intersection 25

Brooks St/2nd St

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	30	27	89.5%	12.9	4.5	B
	Through						
	Right Turn						
	Subtotal	30	27	89.5%	12.9	4.5	B
EB	Left Turn	20	17	82.8%	3.3	0.5	A
	Through	2,140	2,071	96.8%	2.6	0.2	A
	Right Turn						
	Subtotal	2,160	2,088	96.7%	2.6	0.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,190	2,115	96.6%	2.8	0.2	A

Intersection 26


















Lindaro St/2nd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	50	43	86.1%	15.2	3.4	B
	Right Turn	250	239	95.5%	16.4	3.6	B
	Subtotal	300	282	94.0%	16.2	3.4	B
SB	Left Turn	60	66	110.4%	30.1	2.9	C
	Through	295	277	94.1%	24.9	2.4	C
	Right Turn						
	Subtotal	355	344	96.8%	26.0	1.9	C
EB	Left Turn	40	28	69.9%	9.7	3.9	A
	Through	2,120	2,055	96.9%	11.6	0.9	B
	Right Turn	50	53	105.2%	10.4	2.6	B
	Subtotal	2,210	2,136	96.6%	11.6	0.9	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,865	2,761	96.4%	13.9	0.8	B




















HCM 2010 Signalized Intersection Summary
27: Lincoln & 2nd

Baseline Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	2255	40	0	0	0	0	105	50	130	255	0
Future Volume (veh/h)	135	2255	40	0	0	0	0	105	50	130	255	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1398	1398				0	1398	1398	1382	1342	0
Adj Flow Rate, veh/h	147	2451	22				0	114	42	141	277	0
Adj No. of Lanes	0	4	1				0	1	1	0	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	140	2509	598				0	500	411	284	541	0
Arrive On Green	0.18	0.18	0.18				0.00	0.36	0.36	0.12	0.12	0.00
Sat Flow, veh/h	264	4728	1126				0	1398	1151	573	1576	0
Grp Volume(v), veh/h	771	1827	22				0	114	42	215	203	0
Grp Sat Flow(s),veh/h/ln	1385	1202	1126				0	1398	1151	927	1160	0
Q Serve(g_s), s	39.8	37.6	1.2				0.0	4.3	1.8	13.5	12.3	0.0
Cycle Q Clear(g_c), s	39.8	37.6	1.2				0.0	4.3	1.8	17.8	12.3	0.0
Prop In Lane	0.19		1.00				0.00		1.00	0.65		0.00
Lane Grp Cap(c), veh/h	735	1914	598				0	500	411	411	415	0
V/C Ratio(X)	1.05	0.95	0.04				0.00	0.23	0.10	0.52	0.49	0.00
Avail Cap(c_a), veh/h	735	1914	598				0	500	411	411	415	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.9	30.0	15.0				0.0	16.9	16.1	30.3	26.7	0.0
Incr Delay (d2), s/veh	47.0	12.3	0.1				0.0	1.1	0.5	4.7	4.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	24.8	14.7	0.4				0.0	1.8	0.6	4.8	4.4	0.0
LnGrp Delay(d),s/veh	78.0	42.3	15.1				0.0	17.9	16.6	35.0	30.7	0.0
LnGrp LOS	F	D	B					B	B	C	C	
Approach Vol, veh/h		2620						156			418	
Approach Delay, s/veh		52.6						17.6			32.9	
Approach LOS		D						B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		44.0		31.0				31.0				
Change Period (Y+Rc), s		* 4.2		* 4.2				* 4.2				
Max Green Setting (Gmax), s		* 40		* 27				* 27				
Max Q Clear Time (g_c+I1), s		41.8		6.3				19.8				
Green Ext Time (p_c), s		0.0		0.5				1.1				
Intersection Summary												
HCM 2010 Ctrl Delay			48.3									
HCM 2010 LOS			D									
Notes												

















HCM 2010 Signalized Intersection Summary
 28: Francisco W./Tamalpais & 2nd

Baseline Conditions
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	2310	60	0	0	0	0	50	250	110	180	0
Future Volume (veh/h)	50	2310	60	0	0	0	0	50	250	110	180	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1398	1398				0	1398	1454	1398	1398	0
Adj Flow Rate, veh/h	54	2511	39				0	54	233	120	196	0
Adj No. of Lanes	0	4	1				0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	59	2939	651				0	317	273	265	317	0
Arrive On Green	0.20	0.20	0.20				0.00	0.23	0.23	0.07	0.07	0.00
Sat Flow, veh/h	98	4902	1086				0	1398	1203	862	1398	0
Grp Volume(v), veh/h	764	1801	39				0	54	233	120	196	0
Grp Sat Flow(s),veh/h/ln	1393	1202	1086				0	1398	1203	862	1398	0
Q Serve(g_s), s	40.3	36.0	2.2				0.0	2.3	13.9	10.2	10.2	0.0
Cycle Q Clear(g_c), s	40.3	36.0	2.2				0.0	2.3	13.9	12.6	10.2	0.0
Prop In Lane	0.07		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	835	2163	651				0	317	273	265	317	0
V/C Ratio(X)	0.92	0.83	0.06				0.00	0.17	0.85	0.45	0.62	0.00
Avail Cap(c_a), veh/h	835	2163	651				0	569	489	420	569	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	0.09	0.09	0.09				0.00	1.00	1.00	0.97	0.97	0.00
Uniform Delay (d), s/veh	28.2	26.5	12.9				0.0	23.3	27.8	33.8	31.5	0.0
Incr Delay (d2), s/veh	2.0	0.4	0.0				0.0	0.3	7.4	1.2	1.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.1	12.0	0.7				0.0	0.9	5.2	2.5	4.1	0.0
LnGrp Delay(d),s/veh	30.2	26.8	12.9				0.0	23.6	35.2	34.9	33.4	0.0
LnGrp LOS	C	C	B					C	D	C	C	
Approach Vol, veh/h		2604						287			316	
Approach Delay, s/veh		27.6						33.0			34.0	
Approach LOS		C						C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		51.5		23.5				23.5				
Change Period (Y+Rc), s		6.5		6.5				6.5				
Max Green Setting (Gmax), s		31.5		30.5				30.5				
Max Q Clear Time (g_c+I1), s		42.3		15.9				14.6				
Green Ext Time (p_c), s		0.0		1.1				1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			28.7									
HCM 2010 LOS			C									





















HCM 2010 Signalized Intersection Summary
 29: 101 SBO on 2nd/Hetherton & 2nd/2nd St

Baseline Conditions
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1165	1345	0	0	0	0	0	0	195	975	0
Future Volume (veh/h)	0	1165	1345	0	0	0	0	0	0	195	975	0
Number	5	2	12							7	4	14
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1485	1485							1485	1485	0
Adj Flow Rate, veh/h	0	1266	1437							212	1060	0
Adj No. of Lanes	0	3	2							1	2	0
Peak Hour Factor	0.92	0.92	0.92							0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3							3	3	0
Cap, veh/h	0	2050	1162							519	1089	0
Arrive On Green	0.00	0.15	0.15							0.12	0.12	0.00
Sat Flow, veh/h	0	4456	2525							1415	2971	0
Grp Volume(v), veh/h	0	1266	1437							212	1060	0
Grp Sat Flow(s),veh/h/ln	0	1485	1263							1415	1485	0
Q Serve(g_s), s	0.0	19.9	34.5							10.4	26.7	0.0
Cycle Q Clear(g_c), s	0.0	19.9	34.5							10.4	26.7	0.0
Prop In Lane	0.00		1.00							1.00		0.00
Lane Grp Cap(c), veh/h	0	2050	1162							519	1089	0
V/C Ratio(X)	0.00	0.62	1.24							0.41	0.97	0.00
Avail Cap(c_a), veh/h	0	2050	1162							519	1089	0
HCM Platoon Ratio	1.00	0.33	0.33							0.33	0.33	1.00
Upstream Filter(I)	0.00	0.14	0.14							0.79	0.79	0.00
Uniform Delay (d), s/veh	0.0	25.6	31.8							25.4	32.6	0.0
Incr Delay (d2), s/veh	0.0	0.2	107.8							0.4	18.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.2	29.4							4.1	13.7	0.0
LnGrp Delay(d),s/veh	0.0	25.8	139.6							25.9	50.7	0.0
LnGrp LOS		C	F							C	D	
Approach Vol, veh/h		2703									1272	
Approach Delay, s/veh		86.3									46.6	
Approach LOS		F									D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		43.0		32.0								
Change Period (Y+Rc), s		8.5		4.5								
Max Green Setting (Gmax), s		34.5		27.5								
Max Q Clear Time (g_c+I1), s		36.5		28.7								
Green Ext Time (p_c), s		0.0		0.0								
Intersection Summary												
HCM 2010 Ctrl Delay			73.6									
HCM 2010 LOS			E									
Notes												





















HCM 2010 Signalized Intersection Summary
30: Irwin & 2nd St

Baseline Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						  				
Traffic Volume (veh/h)	715	815	0	0	0	0	0	1315	460	0	0	0
Future Volume (veh/h)	715	815	0	0	0	0	0	1315	460	0	0	0
Number	5	2	12				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1454	1485	0				0	1398	1398			
Adj Flow Rate, veh/h	777	886	0				0	1429	450			
Adj No. of Lanes	2	2	0				0	3	1			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0				0	3	3			
Cap, veh/h	1440	1339	0				0	1618	499			
Arrive On Green	0.15	0.15	0.00				0.00	0.42	0.42			
Sat Flow, veh/h	2769	2971	0				0	3943	1176			
Grp Volume(v), veh/h	777	886	0				0	1429	450			
Grp Sat Flow(s),veh/h/ln	1385	1485	0				0	1272	1176			
Q Serve(g_s), s	19.7	21.1	0.0				0.0	25.9	26.8			
Cycle Q Clear(g_c), s	19.7	21.1	0.0				0.0	25.9	26.8			
Prop In Lane	1.00		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	1440	1339	0				0	1618	499			
V/C Ratio(X)	0.54	0.66	0.00				0.00	0.88	0.90			
Avail Cap(c_a), veh/h	1440	1339	0				0	1618	499			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	25.9	26.5	0.0				0.0	19.9	20.2			
Incr Delay (d2), s/veh	1.5	2.6	0.0				0.0	7.4	22.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	7.9	9.2	0.0				0.0	10.1	11.7			
LnGrp Delay(d),s/veh	27.4	29.1	0.0				0.0	27.3	42.4			
LnGrp LOS	C	C						C	D			
Approach Vol, veh/h		1663						1879				
Approach Delay, s/veh		28.3						30.9				
Approach LOS		C						C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		38.0		37.0								
Change Period (Y+Rc), s		* 4.2		* 5.2								
Max Green Setting (Gmax), s		* 34		* 32								
Max Q Clear Time (g_c+I1), s		23.1		28.8								
Green Ext Time (p_c), s		8.8		2.8								
Intersection Summary												
HCM 2010 Ctrl Delay			29.7									
HCM 2010 LOS			C									
Notes												

HCM 2010 Signalized Intersection Summary
31: Lindaro & Andersen

Baseline Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	20	310	50	5	80	210	50	50	270	150	60	200
Future Volume (veh/h)	20	310	50	5	80	210	50	50	270	150	60	200
Number	5	2	12		1	6	16	3	8	18	7	4
Initial Q (Qb), veh	0	0	0		0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94		1.00		0.97	1.00		0.97	1.00	
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	2019	2019	2000		1942	1942	2000	1845	1845	1900	1845	1845
Adj Flow Rate, veh/h	22	337	46		87	228	44	54	293	138	65	217
Adj No. of Lanes	1	1	0		1	1	0	1	1	0	1	1
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
Percent Heavy Veh, %	3	3	3		3	3	3	3	3	3	3	3
Cap, veh/h	58	421	57		159	471	91	152	361	170	169	529
Arrive On Green	0.03	0.24	0.24		0.09	0.30	0.30	0.09	0.31	0.31	0.10	0.32
Sat Flow, veh/h	1923	1726	236		1849	1574	304	1757	1173	553	1757	1667
Grp Volume(v), veh/h	22	0	383		87	0	272	54	0	431	65	0
Grp Sat Flow(s),veh/h/ln	1923	0	1961		1849	0	1878	1757	0	1726	1757	0
Q Serve(g_s), s	0.7	0.0	11.8		2.9	0.0	7.6	1.9	0.0	14.8	2.2	0.0
Cycle Q Clear(g_c), s	0.7	0.0	11.8		2.9	0.0	7.6	1.9	0.0	14.8	2.2	0.0
Prop In Lane	1.00		0.12		1.00		0.16	1.00		0.32	1.00	
Lane Grp Cap(c), veh/h	58	0	478		159	0	562	152	0	531	169	0
V/C Ratio(X)	0.38	0.00	0.80		0.55	0.00	0.48	0.35	0.00	0.81	0.38	0.00
Avail Cap(c_a), veh/h	240	0	675		288	0	704	246	0	720	246	0
HCM Platoon Ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00		1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.6	0.0	22.8		28.2	0.0	18.4	27.6	0.0	20.5	27.2	0.0
Incr Delay (d2), s/veh	1.5	0.0	4.6		1.1	0.0	0.6	0.5	0.0	5.1	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	7.0		1.5	0.0	4.0	0.9	0.0	7.7	1.1	0.0
LnGrp Delay(d),s/veh	32.0	0.0	27.5		29.3	0.0	19.1	28.2	0.0	25.6	27.8	0.0
LnGrp LOS	C		C		C		B	C		C	C	
Approach Vol, veh/h		405				359			485			300
Approach Delay, s/veh		27.7				21.6			25.9			19.9
Approach LOS		C				C			C			B
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.5	20.6	9.6	24.6	5.9	24.1	10.2	24.0				
Change Period (Y+Rc), s	4.0	4.9	4.0	* 4.2	4.0	4.9	4.0	* 4.2				
Max Green Setting (Gmax), s	10.0	22.1	9.0	* 27	8.0	24.1	9.0	* 27				
Max Q Clear Time (g_c+I1), s	4.9	13.8	3.9	8.6	2.7	9.6	4.2	16.8				
Green Ext Time (p_c), s	0.1	1.1	0.0	0.8	0.0	0.9	0.0	1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			24.2									
HCM 2010 LOS			C									
Notes												

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	20
Future Volume (veh/h)	20
Number	14
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	0.91
Parking Bus, Adj	1.00
Adj Sat Flow, veh/h/ln	1900
Adj Flow Rate, veh/h	18
Adj No. of Lanes	0
Peak Hour Factor	0.92
Percent Heavy Veh, %	3
Cap, veh/h	44
Arrive On Green	0.32
Sat Flow, veh/h	138
Grp Volume(v), veh/h	235
Grp Sat Flow(s),veh/h/ln	1805
Q Serve(g_s), s	6.6
Cycle Q Clear(g_c), s	6.6
Prop In Lane	0.08
Lane Grp Cap(c), veh/h	573
V/C Ratio(X)	0.41
Avail Cap(c_a), veh/h	753
HCM Platoon Ratio	1.00
Upstream Filter(l)	1.00
Uniform Delay (d), s/veh	17.2
Incr Delay (d2), s/veh	0.5
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	3.3
LnGrp Delay(d),s/veh	17.7
LnGrp LOS	B
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	

HCM Signalized Intersection Capacity Analysis
 32: Tamalpais & Mission

Baseline Conditions
 Timing Plan: AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↑	↻	
Traffic Volume (vph)	545	25	0	690	25	5
Future Volume (vph)	545	25	0	690	25	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.6			3.0	5.2	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	0.98	
Frt	0.99			1.00	0.98	
Flt Protected	1.00			1.00	0.96	
Satd. Flow (prot)	1560			1573	1441	
Flt Permitted	1.00			1.00	0.96	
Satd. Flow (perm)	1560			1573	1441	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	592	27	0	750	27	5
RTOR Reduction (vph)	2	0	0	0	4	0
Lane Group Flow (vph)	617	0	0	750	28	0
Confl. Peds. (#/hr)		10	10		10	
Turn Type	NA			NA	Perm	
Protected Phases	2			3 4 6		
Permitted Phases					8	
Actuated Green, G (s)	30.1			51.2	13.4	
Effective Green, g (s)	30.1			45.6	13.4	
Actuated g/C Ratio	0.40			0.61	0.18	
Clearance Time (s)	5.6				5.2	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	626			956	257	
v/s Ratio Prot	c0.40			c0.48		
v/s Ratio Perm					c0.02	
v/c Ratio	0.98			0.78	0.11	
Uniform Delay, d1	22.2			11.0	25.8	
Progression Factor	0.78			0.68	1.05	
Incremental Delay, d2	28.6			0.4	0.2	
Delay (s)	46.0			7.9	27.3	
Level of Service	D			A	C	
Approach Delay (s)	46.0			7.9	27.3	
Approach LOS	D			A	C	
Intersection Summary						
HCM 2000 Control Delay		25.2		HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio		0.77				
Actuated Cycle Length (s)		75.0		Sum of lost time (s)		19.0
Intersection Capacity Utilization		55.3%		ICU Level of Service		B
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

33: Tamalpais & 5th

Baseline Conditions

Timing Plan: AM Peak Hour



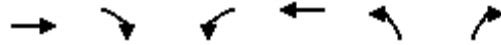
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Traffic Volume (vph)	0	365	20	0	330	50	10	10	10	5	25	20
Future Volume (vph)	0	365	20	0	330	50	10	10	10	5	25	20
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.6			5.6			5.6			5.6	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			0.99			1.00			0.98	
Flpb, ped/bikes		1.00			1.00			0.99			1.00	
Frt		0.99			0.98			0.95			0.94	
Flt Protected		1.00			1.00			0.98			1.00	
Satd. Flow (prot)		1558			1536			1466			1452	
Flt Permitted		1.00			1.00			0.87			0.97	
Satd. Flow (perm)		1558			1536			1293			1409	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	397	22	0	359	54	11	11	11	5	27	22
RTOR Reduction (vph)	0	2	0	0	5	0	0	10	0	0	20	0
Lane Group Flow (vph)	0	417	0	0	408	0	0	23	0	0	34	0
Confl. Peds. (#/hr)	10		10	10		10	10					10
Turn Type		NA			NA		Perm	NA		Perm	NA	
Protected Phases		2			4 6			8			8	
Permitted Phases							8			8		
Actuated Green, G (s)		39.8			56.0			7.8			7.8	
Effective Green, g (s)		39.8			56.0			7.8			7.8	
Actuated g/C Ratio		0.53			0.75			0.10			0.10	
Clearance Time (s)		5.6						5.6			5.6	
Vehicle Extension (s)		3.0						1.5			1.5	
Lane Grp Cap (vph)		826			1146			134			146	
v/s Ratio Prot		c0.27			c0.27							
v/s Ratio Perm								0.02			c0.02	
v/c Ratio		0.50			0.36			0.17			0.23	
Uniform Delay, d1		11.3			3.3			30.7			30.9	
Progression Factor		0.72			0.06			0.63			0.83	
Incremental Delay, d2		1.7			0.1			0.2			0.3	
Delay (s)		9.8			0.3			19.5			25.8	
Level of Service		A			A			B			C	
Approach Delay (s)		9.8			0.3			19.5			25.8	
Approach LOS		A			A			B			C	

Intersection Summary

HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 34: Tamalpais & Mission

Baseline Conditions
 Timing Plan: AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Traffic Volume (vph)	550	0	0	685	5	20
Future Volume (vph)	550	0	0	685	5	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.6			5.6	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.89	
Flt Protected	1.00			1.00	0.99	
Satd. Flow (prot)	1573			1573	1387	
Flt Permitted	1.00			1.00	0.99	
Satd. Flow (perm)	1573			1573	1387	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	598	0	0	745	5	22
RTOR Reduction (vph)	0	0	0	0	17	0
Lane Group Flow (vph)	598	0	0	745	10	0
Confl. Peds. (#/hr)		10				
Turn Type	NA			NA	Prot	
Protected Phases	2 8			6	3 4	
Permitted Phases						
Actuated Green, G (s)	48.7			30.1	15.5	
Effective Green, g (s)	43.5			30.1	15.5	
Actuated g/C Ratio	0.58			0.40	0.21	
Clearance Time (s)				5.6		
Vehicle Extension (s)				3.0		
Lane Grp Cap (vph)	912			631	286	
v/s Ratio Prot	c0.38			c0.47	c0.01	
v/s Ratio Perm						
v/c Ratio	0.66			1.18	0.03	
Uniform Delay, d1	10.7			22.4	23.8	
Progression Factor	0.61			1.15	0.82	
Incremental Delay, d2	0.5			88.9	0.0	
Delay (s)	7.0			114.6	19.4	
Level of Service	A			F	B	
Approach Delay (s)	7.0			114.6	19.4	
Approach LOS	A			F	B	













Intersection Summary			
HCM 2000 Control Delay	65.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

35: Tamalpais & 5th

Baseline Conditions

Timing Plan: AM Peak Hour
















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑			↑				
Traffic Volume (vph)	0	380	0	0	340	20	40	5	25	0	0	0
Future Volume (vph)	0	380	0	0	340	20	40	5	25	0	0	0
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.6			5.6			5.6				
Lane Util. Factor		1.00			1.00			1.00				
Frbp, ped/bikes		1.00			1.00			0.98				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.99			0.95				
Flt Protected		1.00			1.00			0.97				
Satd. Flow (prot)		1573			1557			1431				
Flt Permitted		1.00			1.00			0.97				
Satd. Flow (perm)		1573			1557			1431				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	413	0	0	370	22	43	5	27	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	23	0	0	0	0
Lane Group Flow (vph)	0	413	0	0	390	0	0	52	0	0	0	0
Confl. Peds. (#/hr)	10					10			10			
Turn Type		NA			NA		Split	NA				
Protected Phases		2 8			6		4	4				
Permitted Phases												
Actuated Green, G (s)		53.2			39.8			10.6				
Effective Green, g (s)		53.2			39.8			10.6				
Actuated g/C Ratio		0.71			0.53			0.14				
Clearance Time (s)					5.6			5.6				
Vehicle Extension (s)					3.0			1.5				
Lane Grp Cap (vph)		1115			826			202				
v/s Ratio Prot		c0.26			c0.25			c0.04				
v/s Ratio Perm												
v/c Ratio		0.37			0.47			0.26				
Uniform Delay, d1		4.3			11.0			28.7				
Progression Factor		0.01			0.51			1.27				
Incremental Delay, d2		0.1			1.8			0.2				
Delay (s)		0.1			7.4			36.5				
Level of Service		A			A			D				
Approach Delay (s)		0.1			7.4			36.5			0.0	
Approach LOS		A			A			D			A	
Intersection Summary												
HCM 2000 Control Delay			6.5				HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio			0.43									
Actuated Cycle Length (s)			75.0				Sum of lost time (s)		16.8			
Intersection Capacity Utilization			39.8%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

36: Tamalpais & 4th




















Baseline Conditions

Timing Plan: AM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	0	410	0	0	405	75	10	5	10	0	0	0	
Future Volume (vph)	0	410	0	0	405	75	10	5	10	0	0	0	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Total Lost time (s)		5.6			5.6			5.6					
Lane Util. Factor		1.00			1.00			1.00					
Frbp, ped/bikes		1.00			0.98			0.99					
Flpb, ped/bikes		1.00			1.00			1.00					
Frt		1.00			0.98			0.94					
Flt Protected		1.00			1.00			0.98					
Satd. Flow (prot)		1573			1512			1441					
Flt Permitted		1.00			1.00			0.98					
Satd. Flow (perm)		1573			1512			1441					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	446	0	0	440	82	11	5	11	0	0	0	
RTOR Reduction (vph)	0	0	0	0	8	0	0	9	0	0	0	0	
Lane Group Flow (vph)	0	446	0	0	514	0	0	18	0	0	0	0	
Confl. Peds. (#/hr)	39		22			39			10				
Turn Type		NA			NA		Split	NA					
Protected Phases		2 8			6		4	4					
Permitted Phases													
Actuated Green, G (s)		50.7			32.7			13.5					
Effective Green, g (s)		50.7			32.7			13.5					
Actuated g/C Ratio		0.68			0.44			0.18					
Clearance Time (s)					5.6			5.6					
Vehicle Extension (s)					3.0			3.0					
Lane Grp Cap (vph)		1063			659			259					
v/s Ratio Prot		c0.28			c0.34			c0.01					
v/s Ratio Perm													
v/c Ratio		0.42			0.78			0.07					
Uniform Delay, d1		5.5			18.1			25.5					
Progression Factor		0.06			0.94			1.00					
Incremental Delay, d2		0.3			7.9			0.1					
Delay (s)		0.6			25.0			25.7					
Level of Service		A			C			C					
Approach Delay (s)		0.6			25.0			25.7			0.0		
Approach LOS		A			C			C			A		
Intersection Summary													
HCM 2000 Control Delay			14.1									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.56										
Actuated Cycle Length (s)			75.0									Sum of lost time (s)	16.4
Intersection Capacity Utilization			49.2%									ICU Level of Service	A
Analysis Period (min)			15										
c Critical Lane Group													

HCM 2010 Signalized Intersection Summary
1: Lincoln & Mission

Baseline Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	260	465	20	50	530	70	10	485	50	0	360	300
Future Volume (veh/h)	260	465	20	50	530	70	10	485	50	0	360	300
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.93	1.00		0.95
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1676	1676	1710	1676	1676	1710	1800	1694	1728	0	1765	1728
Adj Flow Rate, veh/h	271	484	19	52	552	67	10	505	42	0	375	116
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	0	2	2
Cap, veh/h	180	941	37	435	640	78	53	1124	92	0	968	294
Arrive On Green	0.11	0.59	0.59	0.87	0.87	0.87	0.77	0.77	0.77	0.00	0.39	0.39
Sat Flow, veh/h	1597	1601	63	844	1463	178	18	2901	238	0	2586	759
Grp Volume(v), veh/h	271	0	503	52	0	619	295	0	262	0	250	241
Grp Sat Flow(s),veh/h/ln	1597	0	1664	844	0	1640	1677	0	1480	0	1676	1580
Q Serve(g_s), s	9.0	0.0	14.3	1.0	0.0	15.4	0.0	0.0	4.9	0.0	8.6	8.8
Cycle Q Clear(g_c), s	9.0	0.0	14.3	3.3	0.0	15.4	4.8	0.0	4.9	0.0	8.6	8.8
Prop In Lane	1.00		0.04	1.00		0.11	0.03		0.16	0.00		0.48
Lane Grp Cap(c), veh/h	180	0	978	435	0	718	696	0	573	0	650	612
V/C Ratio(X)	1.51	0.00	0.51	0.12	0.00	0.86	0.42	0.00	0.46	0.00	0.38	0.39
Avail Cap(c_a), veh/h	180	0	978	435	0	718	696	0	573	0	650	612
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.81	0.00	0.81	0.82	0.00	0.82	0.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	0.0	9.8	3.3	0.0	3.8	6.1	0.0	6.1	0.0	17.6	17.7
Incr Delay (d2), s/veh	255.5	0.0	1.9	0.5	0.0	10.9	1.6	0.0	2.1	0.0	1.7	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.7	0.0	7.1	0.3	0.0	8.0	2.4	0.0	2.2	0.0	4.3	4.1
LnGrp Delay(d),s/veh	291.0	0.0	11.7	3.7	0.0	14.6	7.6	0.0	8.2	0.0	19.3	19.6
LnGrp LOS	F		B	A		B	A		A		B	B
Approach Vol, veh/h		774			671			557			491	
Approach Delay, s/veh		109.5			13.8			7.9			19.5	
Approach LOS		F			B			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		51.2		35.8	12.0	39.2		35.8				
Change Period (Y+Rc), s		* 4.2		4.6	3.0	* 4.2		4.6				
Max Green Setting (Gmax), s		* 47		24.4	9.0	* 35		24.4				
Max Q Clear Time (g_c+I1), s		16.3		6.9	11.0	17.4		10.8				
Green Ext Time (p_c), s		5.4		4.6	0.0	6.3		3.5				
Intersection Summary												
HCM 2010 Ctrl Delay			43.3									
HCM 2010 LOS			D									
Notes												

HCM Signalized Intersection Capacity Analysis

2: Hetherton & Mission

Baseline Conditions

Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↔						↔↑	↔
Traffic Volume (vph)	0	490	50	40	175	0	0	0	0	230	1160	450
Future Volume (vph)	0	490	50	40	175	0	0	0	0	230	1160	450
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	10	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		0.95			1.00						0.95	1.00
Frbp, ped/bikes		1.00			1.00						1.00	0.98
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.99			1.00						1.00	0.85
Flt Protected		1.00			0.99						0.99	1.00
Satd. Flow (prot)		2769			1781						2993	1321
Flt Permitted		1.00			0.85						0.99	1.00
Satd. Flow (perm)		2769			1520						2993	1321
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	510	52	42	182	0	0	0	0	240	1208	469
RTOR Reduction (vph)	0	10	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	552	0	0	224	0	0	0	0	0	1448	469
Confl. Peds. (#/hr)			15	15		4			11			
Confl. Bikes (#/hr)			3			3			3			2
Turn Type		NA		Perm	NA					Split	NA	custom
Protected Phases		4			8					2	2	
Permitted Phases				8								5
Actuated Green, G (s)		30.8			30.8						40.4	33.4
Effective Green, g (s)		30.8			30.8						40.4	33.4
Actuated g/C Ratio		0.39			0.39						0.50	0.42
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		1066			585						1511	551
v/s Ratio Prot		c0.20									c0.48	
v/s Ratio Perm					0.15							0.36
v/c Ratio		0.52			0.38						0.96	0.85
Uniform Delay, d1		18.9			17.7						19.0	21.1
Progression Factor		0.34			0.36						1.00	1.00
Incremental Delay, d2		1.6			1.6						15.1	15.2
Delay (s)		8.1			8.1						34.1	36.3
Level of Service		A			A						C	D
Approach Delay (s)		8.1			8.1			0.0			34.7	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

3: Irwin & Mission




















Baseline Conditions
Timing Plan: PM Peak Hour



Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2	
Lane Configurations											
Traffic Volume (vph)	395	20	305	135	300	20	75	1465	190	50	
Future Volume (vph)	395	20	305	135	300	20	75	1465	190	50	
Ideal Flow (vphpl)	2200	1800	2200	2200	2200	1800	2200	2200	1800	2200	
Lane Width	9	12	10	10	9	12	12	12	12	12	
Total Lost time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Lane Util. Factor		1.00	1.00	1.00	1.00			0.95	1.00		
Frbp, ped/bikes		1.00	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		
Frt		1.00	1.00	1.00	0.85			1.00	0.85		
Flt Protected		0.95	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (prot)		1509	1812	1812	1485			3677	1316		
Flt Permitted		0.63	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (perm)		1000	1812	1812	1485			3677	1316		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	411	21	318	141	312	21	78	1526	198	52	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	38	0	
Lane Group Flow (vph)	0	432	318	141	334	0	0	1604	212	0	
Confl. Peds. (#/hr)							8			3	
Confl. Bikes (#/hr)					4	4					
Turn Type	pm+pt	pm+pt	NA	NA	Prot		Perm	NA	Perm		
Protected Phases	5	5	2	6	6			4			
Permitted Phases	2	2					4			4	
Actuated Green, G (s)		32.8	32.8	16.8	16.8			38.8	38.8		
Effective Green, g (s)		32.8	32.8	16.8	16.8			38.8	38.8		
Actuated g/C Ratio		0.41	0.41	0.21	0.21			0.48	0.48		
Clearance Time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Lane Grp Cap (vph)		485	742	380	311			1783	638		
v/s Ratio Prot		c0.13	0.18	0.08	c0.22						
v/s Ratio Perm		0.23						0.44	0.16		
v/c Ratio		0.89	0.43	0.37	1.07			0.90	0.33		
Uniform Delay, d1		21.7	16.9	27.1	31.6			18.8	12.6		
Progression Factor		0.73	0.75	1.00	1.00			0.46	0.24		
Incremental Delay, d2		16.8	1.3	2.8	72.1			5.0	0.9		
Delay (s)		32.5	14.0	29.8	103.7			13.7	3.9		
Level of Service		C	B	C	F			B	A		
Approach Delay (s)			24.7	81.8				12.4			
Approach LOS			C	F				B			
Intersection Summary											
HCM 2000 Control Delay			26.1							HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.96								
Actuated Cycle Length (s)			80.0							Sum of lost time (s)	12.6
Intersection Capacity Utilization			97.6%							ICU Level of Service	F
Analysis Period (min)			15								
c Critical Lane Group											

HCM 2010 Signalized Intersection Summary
4: Lincoln & 5th

Baseline Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	370	40	30	250	50	40	415	50	60	330	40
Future Volume (veh/h)	80	370	40	30	250	50	40	415	50	60	330	40
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	1.00		0.98	0.98		0.92	0.98		0.92
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1412	1560	1530	1412	1500	1530	1440	1500	1469	1440	1500	1469
Adj Flow Rate, veh/h	83	385	37	31	260	43	42	432	41	62	344	32
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	520	706	68	333	632	104	105	887	82	160	780	73
Arrive On Green	0.50	0.50	0.50	1.00	1.00	1.00	0.76	0.76	0.76	0.76	0.76	0.76
Sat Flow, veh/h	852	1398	134	768	1251	207	140	2335	217	269	2052	192
Grp Volume(v), veh/h	83	0	422	31	0	303	268	0	247	219	0	219
Grp Sat Flow(s),veh/h/ln	852	0	1532	768	0	1457	1387	0	1305	1201	0	1312
Q Serve(g_s), s	4.3	0.0	15.1	1.3	0.0	0.0	0.0	0.0	5.8	0.5	0.0	4.8
Cycle Q Clear(g_c), s	4.3	0.0	15.1	16.4	0.0	0.0	5.3	0.0	5.8	6.3	0.0	4.8
Prop In Lane	1.00		0.09	1.00		0.14	0.16		0.17	0.28		0.15
Lane Grp Cap(c), veh/h	520	0	774	333	0	736	579	0	496	514	0	499
V/C Ratio(X)	0.16	0.00	0.55	0.09	0.00	0.41	0.46	0.00	0.50	0.43	0.00	0.44
Avail Cap(c_a), veh/h	520	0	774	333	0	736	579	0	496	514	0	499
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.97	0.00	0.97	0.85	0.00	0.85	0.75	0.00	0.75
Uniform Delay (d), s/veh	10.9	0.0	13.5	3.0	0.0	0.0	6.6	0.0	6.7	6.4	0.0	6.5
Incr Delay (d2), s/veh	0.7	0.0	2.8	0.5	0.0	1.7	2.3	0.0	3.0	1.9	0.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	6.9	0.3	0.0	0.3	2.4	0.0	2.3	1.9	0.0	1.9
LnGrp Delay(d),s/veh	11.5	0.0	16.3	3.6	0.0	1.7	8.8	0.0	9.7	8.4	0.0	8.6
LnGrp LOS	B		B	A		A	A		A	A		A
Approach Vol, veh/h		505			334			515			438	
Approach Delay, s/veh		15.5			1.8			9.2			8.5	
Approach LOS		B			A			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		45.0		35.0		45.0		35.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		40.4		30.4		40.4		30.4				
Max Q Clear Time (g_c+I1), s		17.1		7.8		18.4		8.3				
Green Ext Time (p_c), s		2.5		2.2		1.5		2.0				
Intersection Summary												
HCM 2010 Ctrl Delay			9.4									
HCM 2010 LOS			A									

HCM Signalized Intersection Capacity Analysis

5: Hetherton & 5th



















Baseline Conditions
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↕↕↕	↗
Traffic Volume (vph)	0	325	180	60	170	0	0	0	0	50	1070	130
Future Volume (vph)	0	325	180	60	170	0	0	0	0	50	1070	130
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		1.00			1.00						0.91	1.00
Frbp, ped/bikes		0.99			1.00						1.00	0.96
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.95			1.00						1.00	0.85
Flt Protected		1.00			0.99						1.00	1.00
Satd. Flow (prot)		1697			1775						4163	1148
Flt Permitted		1.00			0.67						1.00	1.00
Satd. Flow (perm)		1697			1213						4163	1148
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	339	188	62	177	0	0	0	0	52	1115	135
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	508	0	0	240	0	0	0	0	0	1167	135
Confl. Peds. (#/hr)	12		12	12		12			12	12		7
Confl. Bikes (#/hr)			6			4			2			2
Parking (#/hr)											2	2
Turn Type		NA		Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases				8						2		5
Actuated Green, G (s)		35.8			35.8						35.4	28.4
Effective Green, g (s)		35.8			35.8						35.4	28.4
Actuated g/C Ratio		0.45			0.45						0.44	0.35
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		759			542						1842	407
v/s Ratio Prot		c0.30										
v/s Ratio Perm					0.20						0.28	0.12
v/c Ratio		0.67			0.44						0.63	0.33
Uniform Delay, d1		17.4			15.2						17.3	18.9
Progression Factor		0.32			1.02						0.35	0.43
Incremental Delay, d2		4.4			2.1						0.6	0.8
Delay (s)		10.0			17.6						6.7	8.9
Level of Service		B			B						A	A
Approach Delay (s)		10.0			17.6			0.0			6.9	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			8.9								A	
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			80.0							10.8		
Intersection Capacity Utilization			91.0%								F	
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												




















HCM 2010 Signalized Intersection Summary
6: Irwin & 5th

Baseline Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	150	0	0	130	110	90	1410	20	0	0	0
Future Volume (veh/h)	245	150	0	0	130	110	90	1410	20	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.96			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1588	1588	0	0	1588	1620	1620	1588	1620			
Adj Flow Rate, veh/h	255	156	0	0	135	105	94	1469	19			
Adj No. of Lanes	1	1	0	0	1	0	0	3	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	2	0	2	0			
Cap, veh/h	360	643	0	0	287	224	123	2056	27			
Arrive On Green	0.68	0.68	0.00	0.00	0.41	0.41	0.16	0.16	0.16			
Sat Flow, veh/h	1017	1588	0	0	710	552	257	4282	57			
Grp Volume(v), veh/h	255	156	0	0	0	240	576	481	525			
Grp Sat Flow(s),veh/h/ln	1017	1588	0	0	0	1262	1575	1445	1576			
Q Serve(g_s), s	19.2	3.0	0.0	0.0	0.0	11.2	28.0	25.2	25.2			
Cycle Q Clear(g_c), s	30.4	3.0	0.0	0.0	0.0	11.2	28.0	25.2	25.2			
Prop In Lane	1.00		0.00	0.00		0.44	0.16		0.04			
Lane Grp Cap(c), veh/h	360	643	0	0	0	511	756	694	756			
V/C Ratio(X)	0.71	0.24	0.00	0.00	0.00	0.47	0.76	0.69	0.69			
Avail Cap(c_a), veh/h	360	643	0	0	0	511	756	694	756			
HCM Platoon Ratio	1.67	1.67	1.00	1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	18.0	8.2	0.0	0.0	0.0	17.5	29.3	28.1	28.1			
Incr Delay (d2), s/veh	11.2	0.9	0.0	0.0	0.0	3.1	7.1	5.6	5.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.4	1.5	0.0	0.0	0.0	4.3	13.7	11.2	12.1			
LnGrp Delay(d),s/veh	29.2	9.1	0.0	0.0	0.0	20.6	36.4	33.7	33.3			
LnGrp LOS	C	A				C	D	C	C			
Approach Vol, veh/h		411			240			1582				
Approach Delay, s/veh		21.6			20.6			34.6				
Approach LOS		C			C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		37.0		43.0		37.0						
Change Period (Y+Rc), s		4.6		4.6		4.6						
Max Green Setting (Gmax), s		32.4		38.4		32.4						
Max Q Clear Time (g_c+I1), s		32.4		30.0		13.2						
Green Ext Time (p_c), s		0.0		4.7		0.9						
Intersection Summary												
HCM 2010 Ctrl Delay				30.7								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary
7: Lincoln & 4th

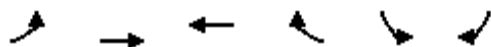
Baseline Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	230	40	105	250	70	30	395	85	45	290	65
Future Volume (veh/h)	55	230	40	105	250	70	30	395	85	45	290	65
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.91	0.97		0.91	0.92		0.83	0.96		0.83
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1588	1525	1620	1588	1588	1620	1620	1588	1555	1620	1588	1555
Adj Flow Rate, veh/h	57	240	34	109	260	59	31	411	67	47	302	47
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	390	657	93	472	626	142	86	899	141	122	721	119
Arrive On Green	0.51	0.51	0.51	0.17	0.17	0.17	0.13	0.13	0.13	0.77	0.77	0.77
Sat Flow, veh/h	937	1288	182	960	1227	278	94	2335	367	171	1873	310
Grp Volume(v), veh/h	57	0	274	109	0	319	274	0	235	196	0	200
Grp Sat Flow(s),veh/h/ln	937	0	1471	960	0	1505	1507	0	1289	1038	0	1316
Q Serve(g_s), s	3.5	0.0	9.0	8.2	0.0	15.2	0.0	0.0	13.6	3.2	0.0	4.0
Cycle Q Clear(g_c), s	18.7	0.0	9.0	17.2	0.0	15.2	12.8	0.0	13.6	16.8	0.0	4.0
Prop In Lane	1.00		0.12	1.00		0.18	0.11		0.28	0.24		0.24
Lane Grp Cap(c), veh/h	390	0	750	472	0	768	630	0	496	456	0	507
V/C Ratio(X)	0.15	0.00	0.37	0.23	0.00	0.42	0.43	0.00	0.47	0.43	0.00	0.39
Avail Cap(c_a), veh/h	390	0	750	472	0	768	630	0	496	456	0	507
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.92	0.00	0.92	0.88	0.00	0.88	0.85	0.00	0.85
Uniform Delay (d), s/veh	19.7	0.0	11.8	27.5	0.0	22.6	27.0	0.0	27.4	7.0	0.0	6.1
Incr Delay (d2), s/veh	0.8	0.0	1.4	1.1	0.0	1.5	1.9	0.0	2.8	2.5	0.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	3.9	2.3	0.0	6.7	5.9	0.0	5.2	1.5	0.0	1.6
LnGrp Delay(d),s/veh	20.5	0.0	13.2	28.5	0.0	24.1	29.0	0.0	30.2	9.5	0.0	8.1
LnGrp LOS	C		B	C		C	C		C	A		A
Approach Vol, veh/h		331			428			509			396	
Approach Delay, s/veh		14.4			25.3			29.5			8.8	
Approach LOS		B			C			C			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		45.0		35.0		45.0		35.0				
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2		* 4.2				
Max Green Setting (Gmax), s		* 41		* 31		* 41		* 31				
Max Q Clear Time (g_c+I1), s		20.7		15.6		19.2		18.8				
Green Ext Time (p_c), s		2.9		4.0		4.1		2.7				
Intersection Summary												
HCM 2010 Ctrl Delay			20.5									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis

8: 4th & Tamalpais

Baseline Conditions
Timing Plan: PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↔			↗
Traffic Volume (vph)	0	370	380	65	0	55
Future Volume (vph)	0	370	380	65	0	55
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0	6.0			5.6
Lane Util. Factor		1.00	1.00			1.00
Frbp, ped/bikes		1.00	0.97			0.78
Flpb, ped/bikes		1.00	1.00			1.00
Frt		1.00	0.98			0.86
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		1588	1516			1074
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		1588	1516			1074
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	385	396	68	0	57
RTOR Reduction (vph)	0	0	7	0	0	48
Lane Group Flow (vph)	0	385	457	0	0	9
Confl. Peds. (#/hr)				59		78
Confl. Bikes (#/hr)				14		
Turn Type		NA	NA			Perm
Protected Phases		2 8	4 6			
Permitted Phases						8
Actuated Green, G (s)		55.1	56.1			12.3
Effective Green, g (s)		55.1	56.1			12.3
Actuated g/C Ratio		0.69	0.70			0.15
Clearance Time (s)						5.6
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)		1093	1063			165
v/s Ratio Prot		c0.24	c0.30			
v/s Ratio Perm						0.01
v/c Ratio		0.35	0.43			0.05
Uniform Delay, d1		5.1	5.1			28.9
Progression Factor		0.95	0.17			1.00
Incremental Delay, d2		0.2	0.2			0.1
Delay (s)		5.0	1.1			29.0
Level of Service		A	A			C
Approach Delay (s)		5.0	1.1		29.0	
Approach LOS		A	A		C	
Intersection Summary						
HCM 2000 Control Delay			4.5		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.47			
Actuated Cycle Length (s)			80.0		Sum of lost time (s)	17.6
Intersection Capacity Utilization			51.0%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
9: Hetherton & 4th

Baseline Conditions
Timing Plan: PM Peak Hour





















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↖	↑						↑↑↑	↗
Traffic Volume (vph)	0	270	110	80	240	0	0	0	0	125	955	230
Future Volume (vph)	0	270	110	80	240	0	0	0	0	125	955	230
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	13	10	15	11	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Lane Util. Factor		1.00	1.00	1.00	1.00						0.91	1.00
Frbp, ped/bikes		1.00	0.93	1.00	1.00						1.00	0.92
Flpb, ped/bikes		1.00	1.00	0.97	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						0.99	1.00
Satd. Flow (prot)		1641	1173	1605	1535						4142	1102
Flt Permitted		1.00	1.00	0.52	1.00						0.99	1.00
Satd. Flow (perm)		1641	1173	874	1535						4142	1102
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	281	115	83	250	0	0	0	0	130	995	240
RTOR Reduction (vph)	0	0	29	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	281	86	83	250	0	0	0	0	0	1125	240
Confl. Peds. (#/hr)			51	51		28			11	11		19
Confl. Bikes (#/hr)			10			16			1			1
Parking (#/hr)											2	2
Turn Type		NA	Perm	Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases			4	8						2		5
Actuated Green, G (s)		34.8	34.8	34.8	34.8						36.4	29.4
Effective Green, g (s)		34.8	34.8	34.8	34.8						36.4	29.4
Actuated g/C Ratio		0.43	0.43	0.43	0.43						0.45	0.37
Clearance Time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		713	510	380	667						1884	404
v/s Ratio Prot		c0.17			0.16							
v/s Ratio Perm			0.07	0.10							0.27	0.22
v/c Ratio		0.39	0.17	0.22	0.37						0.60	0.59
Uniform Delay, d1		15.4	13.8	14.1	15.3						16.3	20.5
Progression Factor		0.52	0.38	0.88	0.92						0.38	0.49
Incremental Delay, d2		1.6	0.7	1.2	1.5						1.1	4.9
Delay (s)		9.6	5.9	13.7	15.5						7.4	14.9
Level of Service		A	A	B	B						A	B
Approach Delay (s)		8.5			15.0			0.0			8.7	
Approach LOS		A			B			A			A	

Intersection Summary		
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service A
HCM 2000 Volume to Capacity ratio	0.51	
Actuated Cycle Length (s)	80.0	Sum of lost time (s) 10.8
Intersection Capacity Utilization	73.6%	ICU Level of Service D
Analysis Period (min)	15	

c Critical Lane Group


















HCM 2010 Signalized Intersection Summary
10: Irwin & 4th

Baseline Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	210	0	0	195	90	125	1260	160	0	0	0
Future Volume (veh/h)	175	210	0	0	195	90	125	1260	160	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.95	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1588	1588	0	0	1588	1620	1525	1588	1620			
Adj Flow Rate, veh/h	182	219	0	0	203	72	130	1312	146			
Adj No. of Lanes	1	1	0	0	1	0	1	3	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	234	552	0	0	333	118	795	2166	241			
Arrive On Green	0.11	0.11	0.00	0.00	0.11	0.11	0.18	0.18	0.18			
Sat Flow, veh/h	985	1588	0	0	959	340	1452	3955	440			
Grp Volume(v), veh/h	182	219	0	0	0	275	130	959	499			
Grp Sat Flow(s),veh/h/ln	985	1588	0	0	0	1299	1452	1445	1505			
Q Serve(g_s), s	11.7	10.2	0.0	0.0	0.0	16.1	6.0	24.4	24.4			
Cycle Q Clear(g_c), s	27.8	10.2	0.0	0.0	0.0	16.1	6.0	24.4	24.4			
Prop In Lane	1.00		0.00	0.00		0.26	1.00		0.29			
Lane Grp Cap(c), veh/h	234	552	0	0	0	451	795	1583	824			
V/C Ratio(X)	0.78	0.40	0.00	0.00	0.00	0.61	0.16	0.61	0.61			
Avail Cap(c_a), veh/h	234	552	0	0	0	451	795	1583	824			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	0.33	0.33	0.33	0.33	0.33			
Upstream Filter(I)	0.92	0.92	0.00	0.00	0.00	1.00	0.35	0.35	0.35			
Uniform Delay (d), s/veh	44.7	27.6	0.0	0.0	0.0	30.2	17.3	24.8	24.8			
Incr Delay (d2), s/veh	20.7	2.0	0.0	0.0	0.0	6.0	0.2	0.6	1.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.4	4.8	0.0	0.0	0.0	6.6	2.5	9.9	10.4			
LnGrp Delay(d),s/veh	65.4	29.6	0.0	0.0	0.0	36.3	17.5	25.4	26.0			
LnGrp LOS	E	C				D	B	C	C			
Approach Vol, veh/h		401			275			1588				
Approach Delay, s/veh		45.9			36.3			25.0				
Approach LOS		D			D			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		32.0		48.0		32.0						
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2						
Max Green Setting (Gmax), s		* 28		* 44		* 28						
Max Q Clear Time (g_c+I1), s		29.8		26.4		18.1						
Green Ext Time (p_c), s		0.0		7.8		0.8						
Intersection Summary												
HCM 2010 Ctrl Delay			30.0									
HCM 2010 LOS			C									
Notes												













HCM 2010 Signalized Intersection Summary
 11: D & 3rd

Baseline Conditions
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  						 	
Traffic Volume (veh/h)	0	0	0	300	1485	0	0	0	0	0	280	50
Future Volume (veh/h)	0	0	0	300	1485	0	0	0	0	0	280	50
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.95
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.82
Adj Sat Flow, veh/h/ln				1530	1500	0				0	1500	1530
Adj Flow Rate, veh/h				312	1547	0				0	292	33
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				455	1994	0				0	626	70
Arrive On Green				0.21	0.21	0.00				0.00	0.27	0.27
Sat Flow, veh/h				625	3326	0				0	2415	261
Grp Volume(v), veh/h				671	1188	0				0	176	149
Grp Sat Flow(s),veh/h/ln				1344	1242	0				0	1425	1176
Q Serve(g_s), s				38.0	36.1	0.0				0.0	8.3	8.5
Cycle Q Clear(g_c), s				38.0	36.1	0.0				0.0	8.3	8.5
Prop In Lane				0.46		0.00				0.00		0.22
Lane Grp Cap(c), veh/h				902	1546	0				0	381	315
V/C Ratio(X)				0.74	0.77	0.00				0.00	0.46	0.47
Avail Cap(c_a), veh/h				902	1546	0				0	381	315
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				27.1	26.3	0.0				0.0	24.5	24.6
Incr Delay (d2), s/veh				5.5	3.7	0.0				0.0	4.0	5.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				15.6	13.2	0.0				0.0	3.7	3.2
LnGrp Delay(d),s/veh				32.6	30.1	0.0				0.0	28.5	29.6
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1859						325	
Approach Delay, s/veh					31.0						29.0	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		54.0		26.0								
Change Period (Y+Rc), s		* 4.2		4.6								
Max Green Setting (Gmax), s		* 50		21.4								
Max Q Clear Time (g_c+I1), s		40.0		10.5								
Green Ext Time (p_c), s		6.4		1.0								
Intersection Summary												
HCM 2010 Ctrl Delay				30.7								
HCM 2010 LOS				C								
Notes												













HCM 2010 Signalized Intersection Summary
 12: C & 3rd

Baseline Conditions
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↗		↖				
Traffic Volume (veh/h)	0	0	0	0	1655	150	140	310	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1655	150	140	310	0	0	0	0
Number				5	2	12	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.98	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1412	1412	1440	1412	0			
Adj Flow Rate, veh/h				0	1724	120	146	323	0			
Adj No. of Lanes				0	3	1	0	2	0			
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %				0	2	2	2	2	0			
Cap, veh/h				0	2351	717	266	507	0			
Arrive On Green				0.00	0.20	0.20	0.09	0.09	0.00			
Sat Flow, veh/h				0	3981	1175	683	1842	0			
Grp Volume(v), veh/h				0	1724	120	253	216	0			
Grp Sat Flow(s),veh/h/ln				0	1285	1175	1241	1220	0			
Q Serve(g_s), s				0.0	33.5	6.8	14.8	13.6	0.0			
Cycle Q Clear(g_c), s				0.0	33.5	6.8	15.8	13.6	0.0			
Prop In Lane				0.00		1.00	0.58		0.00			
Lane Grp Cap(c), veh/h				0	2351	717	425	348	0			
V/C Ratio(X)				0.00	0.73	0.17	0.60	0.62	0.00			
Avail Cap(c_a), veh/h				0	2351	717	425	348	0			
HCM Platoon Ratio				1.00	0.33	0.33	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	25.9	15.2	33.0	32.1	0.0			
Incr Delay (d2), s/veh				0.0	2.1	0.5	6.0	8.1	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	12.4	2.3	6.1	5.4	0.0			
LnGrp Delay(d),s/veh				0.0	27.9	15.7	39.0	40.2	0.0			
LnGrp LOS					C	B	D	D				
Approach Vol, veh/h					1844			469				
Approach Delay, s/veh					27.1			39.6				
Approach LOS					C			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		53.0		27.0								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 49		* 23								
Max Q Clear Time (g_c+I1), s		35.5		17.8								
Green Ext Time (p_c), s		8.2		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay				29.6								
HCM 2010 LOS				C								
Notes												

















HCM 2010 Signalized Intersection Summary
13: B & 3rd

Baseline Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑						↑↑	
Traffic Volume (veh/h)	0	0	0	180	1720	0	0	0	0	0	275	90
Future Volume (veh/h)	0	0	0	180	1720	0	0	0	0	0	275	90
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.86
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1440	1412	0				0	1412	1440
Adj Flow Rate, veh/h				188	1792	0				0	286	77
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				264	2122	0				0	499	129
Arrive On Green				0.21	0.21	0.00				0.00	0.26	0.26
Sat Flow, veh/h				326	3458	0				0	1988	496
Grp Volume(v), veh/h				729	1251	0				0	196	167
Grp Sat Flow(s),veh/h/ln				1330	1169	0				0	1341	1072
Q Serve(g_s), s				39.9	41.1	0.0				0.0	10.2	10.9
Cycle Q Clear(g_c), s				42.3	41.1	0.0				0.0	10.2	10.9
Prop In Lane				0.26		0.00				0.00		0.46
Lane Grp Cap(c), veh/h				901	1485	0				0	349	279
V/C Ratio(X)				0.81	0.84	0.00				0.00	0.56	0.60
Avail Cap(c_a), veh/h				901	1485	0				0	349	279
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				28.2	27.8	0.0				0.0	25.7	25.9
Incr Delay (d2), s/veh				7.8	6.0	0.0				0.0	6.4	9.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				17.5	14.6	0.0				0.0	4.4	3.9
LnGrp Delay(d),s/veh				35.9	33.8	0.0				0.0	32.1	35.1
LnGrp LOS				D	C						C	D
Approach Vol, veh/h					1980						363	
Approach Delay, s/veh					34.6						33.5	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		55.0		25.0								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 51		* 21								
Max Q Clear Time (g_c+I1), s		44.3		12.9								
Green Ext Time (p_c), s		4.9		1.0								
Intersection Summary												
HCM 2010 Ctrl Delay				34.4								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary
14: A & 3rd

Baseline Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	70	1570	90	240	155	0	0	170	50
Future Volume (veh/h)	0	0	0	70	1570	90	240	155	0	0	170	50
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.91	0.96		1.00	1.00		0.92
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1800	1765	1800	1853	1853	0	0	1853	1890
Adj Flow Rate, veh/h				73	1635	87	250	161	0	0	177	38
Adj No. of Lanes				0	3	0	1	1	0	0	1	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				105	2505	138	299	649	0	0	299	64
Arrive On Green				0.18	0.18	0.18	0.10	0.58	0.00	0.00	0.23	0.23
Sat Flow, veh/h				194	4606	253	1765	1853	0	0	1294	278
Grp Volume(v), veh/h				662	551	582	250	161	0	0	0	215
Grp Sat Flow(s),veh/h/ln				1755	1606	1692	1765	1853	0	0	0	1571
Q Serve(g_s), s				28.3	25.4	25.5	2.1	3.4	0.0	0.0	0.0	9.7
Cycle Q Clear(g_c), s				28.3	25.4	25.5	2.1	3.4	0.0	0.0	0.0	9.7
Prop In Lane				0.11		0.15	1.00		0.00	0.00		0.18
Lane Grp Cap(c), veh/h				954	873	920	299	649	0	0	0	363
V/C Ratio(X)				0.69	0.63	0.63	0.84	0.25	0.00	0.00	0.00	0.59
Avail Cap(c_a), veh/h				954	873	920	299	649	0	0	0	363
HCM Platoon Ratio				0.33	0.33	0.33	1.67	1.67	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				26.6	25.4	25.4	32.4	11.5	0.0	0.0	0.0	27.4
Incr Delay (d2), s/veh				4.1	3.5	3.3	23.3	0.9	0.0	0.0	0.0	6.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				14.8	12.1	12.8	7.0	1.9	0.0	0.0	0.0	4.9
LnGrp Delay(d),s/veh				30.7	28.9	28.7	55.7	12.4	0.0	0.0	0.0	34.3
LnGrp LOS				C	C	C	E	B				C
Approach Vol, veh/h					1795			411			215	
Approach Delay, s/veh					29.5			38.7			34.3	
Approach LOS					C			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			9.0	23.0		48.0		32.0				
Change Period (Y+Rc), s			4.0	4.5		4.5		4.0				
Max Green Setting (Gmax), s			5.0	18.5		43.5		28.0				
Max Q Clear Time (g_c+I1), s			4.1	11.7		30.3		5.4				
Green Ext Time (p_c), s			0.2	0.8		11.0		1.2				
Intersection Summary												
HCM 2010 Ctrl Delay				31.5								
HCM 2010 LOS				C								

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

BioMarin
Baseline Conditions
PM Peak Hour

Intersection 15 Brooks St/3rd St Side-street Stop
















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	40	39	97.5%	11.5	4.2	B
	Through	5	4	73.6%	7.4	8.0	A
	Right Turn						
	Subtotal	45	43	94.9%	11.4	3.8	B
SB	Left Turn						
	Through	10	10	99.4%	21.4	11.4	C
	Right Turn	5	6	117.8%	10.1	10.9	B
	Subtotal	15	16	105.5%	21.6	6.8	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	65	65	99.6%	2.4	0.4	A
	Through	1,690	1,619	95.8%	1.6	0.4	A
	Right Turn	5	2	44.2%	0.5	0.9	A
	Subtotal	1,760	1,686	95.8%	1.6	0.4	A
Total		1,820	1,745	95.9%	2.0	0.5	A

Intersection 16 Lindero St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	110	109	99.0%	25.8	2.7	C
	Through	20	28	138.0%	23.5	6.2	C
	Right Turn						
	Subtotal	130	137	105.0%	25.2	2.5	C
SB	Left Turn						
	Through	50	43	86.1%	18.6	4.5	B
	Right Turn	10	10	95.7%	10.8	12.1	B
	Subtotal	60	53	87.7%	16.5	3.4	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	220	210	95.3%	11.7	2.7	B
	Through	1,725	1,614	93.5%	9.1	1.7	A
	Right Turn	40	37	92.9%	6.6	1.6	A
	Subtotal	1,985	1,861	93.7%	9.3	1.7	A
Total		2,175	2,050	94.2%	10.6	1.7	B

HCM 2010 Signalized Intersection Summary
17: Lincoln & 3rd



















Baseline Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	100	1685	130	40	325	0	0	265	150
Future Volume (veh/h)	0	0	0	100	1685	130	40	325	0	0	265	150
Number				1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	0.97		1.00	1.00		0.83
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1620	1588	1620	1620	1588	0	0	1525	1555
Adj Flow Rate, veh/h				104	1755	125	42	339	0	0	276	149
Adj No. of Lanes				0	3	0	0	2	0	0	2	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				127	2282	167	101	734	0	0	552	279
Arrive On Green				0.19	0.19	0.19	0.64	0.64	0.00	0.00	0.11	0.11
Sat Flow, veh/h				224	4013	294	144	2376	0	0	1807	874
Grp Volume(v), veh/h				733	610	641	190	191	0	0	228	197
Grp Sat Flow(s),veh/h/ln				1577	1445	1508	1075	1373	0	0	1448	1157
Q Serve(g_s), s				35.6	31.9	32.1	2.5	5.6	0.0	0.0	11.9	12.9
Cycle Q Clear(g_c), s				35.6	31.9	32.1	15.4	5.6	0.0	0.0	11.9	12.9
Prop In Lane				0.14		0.19	0.22		0.00	0.00		0.76
Lane Grp Cap(c), veh/h				897	822	858	398	438	0	0	462	369
V/C Ratio(X)				0.82	0.74	0.75	0.48	0.44	0.00	0.00	0.49	0.53
Avail Cap(c_a), veh/h				897	822	858	398	438	0	0	462	369
HCM Platoon Ratio				0.33	0.33	0.33	2.00	2.00	1.00	1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				28.5	27.0	27.1	11.4	10.9	0.0	0.0	29.7	30.2
Incr Delay (d2), s/veh				8.1	6.0	5.9	4.1	3.1	0.0	0.0	3.7	5.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				17.6	14.2	14.8	2.4	2.4	0.0	0.0	5.3	4.7
LnGrp Delay(d),s/veh				36.6	33.0	33.0	15.5	14.0	0.0	0.0	33.4	35.6
LnGrp LOS				D	C	C	B	B			C	D
Approach Vol, veh/h					1984			381			425	
Approach Delay, s/veh					34.3			14.7			34.5	
Approach LOS					C			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				30.0		50.0		30.0				
Change Period (Y+Rc), s				4.5		4.5		4.5				
Max Green Setting (Gmax), s				25.5		45.5		25.5				
Max Q Clear Time (g_c+I1), s				17.4		37.6		14.9				
Green Ext Time (p_c), s				1.0		5.5		1.5				
Intersection Summary												
HCM 2010 Ctrl Delay				31.7								
HCM 2010 LOS				C								

HCM Signalized Intersection Capacity Analysis





















18: Tamalpais & 3rd

01/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  							
Traffic Volume (vph)	0	0	0	300	1760	30	110	50	0	0	30	30
Future Volume (vph)	0	0	0	300	1760	30	110	50	0	0	30	30
Ideal Flow (vphpl)	1800	1800	1800	1600	1600	1600	1600	1600	1800	1800	1600	1600
Lane Width	12	12	12	12	12	12	11	12	12	12	12	12
Total Lost time (s)					11.6		7.6	7.6			7.6	
Lane Util. Factor					0.91		1.00	1.00			1.00	
Frbp, ped/bikes					1.00		1.00	1.00			0.97	
Flpb, ped/bikes					0.97		0.96	1.00			1.00	
Frt					1.00		1.00	1.00			0.93	
Flt Protected					0.99		0.95	1.00			1.00	
Satd. Flow (prot)					3681		1100	1249			1128	
Flt Permitted					0.99		0.72	1.00			1.00	
Satd. Flow (perm)					3681		830	1249			1128	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	312	1833	31	115	52	0	0	31	31
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	0	0	0	2175	0	115	52	0	0	53	0
Confl. Peds. (#/hr)			106	106		44	30		69			30
Confl. Bikes (#/hr)						2			3			8
Parking (#/hr)							3	3			3	3
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					6			4			8	
Permitted Phases				6			4					
Actuated Green, G (s)					51.4		19.4	19.4			19.4	
Effective Green, g (s)					51.4		19.4	19.4			19.4	
Actuated g/C Ratio					0.57		0.22	0.22			0.22	
Clearance Time (s)					11.6		7.6	7.6			7.6	
Lane Grp Cap (vph)					2102		178	269			243	
v/s Ratio Prot								0.04			0.05	
v/s Ratio Perm					0.59		0.14					
v/c Ratio					1.03		0.65	0.19			0.22	
Uniform Delay, d1					19.3		32.2	28.9			29.1	
Progression Factor					1.00		1.00	1.00			1.00	
Incremental Delay, d2					29.3		16.7	1.6			2.1	
Delay (s)					48.6		48.9	30.5			31.1	
Level of Service					D		D	C			C	
Approach Delay (s)		0.0			48.6			43.2			31.1	
Approach LOS		A			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			47.8		HCM 2000 Level of Service				D			
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)				19.2			
Intersection Capacity Utilization			154.9%		ICU Level of Service				H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
 19: Hetherton & 3rd













01/21/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  						  	
Traffic Volume (veh/h)	0	0	0	480	1585	0	0	0	0	0	665	480
Future Volume (veh/h)	0	0	0	480	1585	0	0	0	0	0	665	480
Number				1	6	16				3	8	18
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.85
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1560	1588	0				0	1588	1500
Adj Flow Rate, veh/h				500	1651	0				0	693	492
Adj No. of Lanes				1	3	0				0	3	1
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				740	2085	0				0	1951	489
Arrive On Green				0.14	0.14	0.00				0.00	0.15	0.15
Sat Flow, veh/h				1486	4765	0				0	4479	1088
Grp Volume(v), veh/h				500	1651	0				0	693	492
Grp Sat Flow(s),veh/h/ln				1486	1588	0				0	1445	1088
Q Serve(g_s), s				25.9	26.8	0.0				0.0	11.5	36.0
Cycle Q Clear(g_c), s				25.9	26.8	0.0				0.0	11.5	36.0
Prop In Lane				1.00		0.00				0.00		1.00
Lane Grp Cap(c), veh/h				740	2085	0				0	1951	489
V/C Ratio(X)				0.68	0.79	0.00				0.00	0.36	1.01
Avail Cap(c_a), veh/h				740	2085	0				0	1951	489
HCM Platoon Ratio				0.33	0.33	1.00				1.00	0.33	0.33
Upstream Filter(l)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				30.3	30.7	0.0				0.0	23.6	34.1
Incr Delay (d2), s/veh				4.9	3.2	0.0				0.0	0.5	42.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.7	12.4	0.0				0.0	4.7	16.5
LnGrp Delay(d),s/veh				35.2	33.9	0.0				0.0	24.1	76.1
LnGrp LOS				D	C						C	F
Approach Vol, veh/h					2151						1185	
Approach Delay, s/veh					34.2						45.7	
Approach LOS					C						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs						6		8				
Phs Duration (G+Y+Rc), s						39.0		41.0				
Change Period (Y+Rc), s						4.0		5.0				
Max Green Setting (Gmax), s						35.0		36.0				
Max Q Clear Time (g_c+I1), s						28.8		38.0				
Green Ext Time (p_c), s						4.9		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay					38.3							
HCM 2010 LOS					D							
Notes												
User approved volume balancing among the lanes for turning movement.												

User approved ignoring U-Turning movement.













HCM 2010 Signalized Intersection Summary
20: Irwin & 3rd/3rd St

Baseline Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑	↑	↑↑↑				
Traffic Volume (veh/h)	0	0	0	0	1150	195	910	1350	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1150	195	910	1350	0	0	0	0
Number				1	6	16	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.94	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1500	1500	1398	1398	0			
Adj Flow Rate, veh/h				0	1198	187	1026	1297	0			
Adj No. of Lanes				0	3	1	2	2	0			
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %				0	2	2	3	3	0			
Cap, veh/h				0	1510	441	1381	1450	0			
Arrive On Green				0.00	0.37	0.37	0.17	0.17	0.00			
Sat Flow, veh/h				0	4230	1195	2663	2796	0			
Grp Volume(v), veh/h				0	1198	187	1026	1297	0			
Grp Sat Flow(s),veh/h/ln				0	1365	1195	1331	1398	0			
Q Serve(g_s), s				0.0	20.9	9.4	29.3	36.3	0.0			
Cycle Q Clear(g_c), s				0.0	20.9	9.4	29.3	36.3	0.0			
Prop In Lane				0.00		1.00	1.00		0.00			
Lane Grp Cap(c), veh/h				0	1510	441	1381	1450	0			
V/C Ratio(X)				0.00	0.79	0.42	0.74	0.89	0.00			
Avail Cap(c_a), veh/h				0	1510	441	1381	1450	0			
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	22.5	18.9	28.1	31.0	0.0			
Incr Delay (d2), s/veh				0.0	4.4	3.0	3.6	8.8	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	8.4	3.4	11.5	15.8	0.0			
LnGrp Delay(d),s/veh				0.0	26.9	21.9	31.7	39.8	0.0			
LnGrp LOS					C	C	C	D				
Approach Vol, veh/h					1385			2323				
Approach Delay, s/veh					26.2			36.3				
Approach LOS					C			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				46.0		34.0						
Change Period (Y+Rc), s				4.5		4.5						
Max Green Setting (Gmax), s				41.5		29.5						
Max Q Clear Time (g_c+I1), s				38.3		22.9						
Green Ext Time (p_c), s				2.8		3.8						
Intersection Summary												
HCM 2010 Ctrl Delay				32.5								
HCM 2010 LOS				C								
Notes												













HCM 2010 Signalized Intersection Summary
21: D & 2nd

Baseline Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑		↑	↑	
Traffic Volume (veh/h)	0	1525	100	0	0	0	0	0	400	170	430	0
Future Volume (veh/h)	0	1525	100	0	0	0	0	0	400	170	430	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1676	1710				0	1588	1620	1765	1765	0
Adj Flow Rate, veh/h	0	1589	95				0	0	402	177	448	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	0	0	0				0	0	1145	992	1526	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.86	0.29	0.29	0.00
Sat Flow, veh/h		0					0	0	1324	969	1765	0
Grp Volume(v), veh/h		0.0					0	0	402	177	448	0
Grp Sat Flow(s),veh/h/ln							0	0	1324	969	1765	0
Q Serve(g_s), s							0.0	0.0	2.0	4.9	6.7	0.0
Cycle Q Clear(g_c), s							0.0	0.0	2.0	6.9	6.7	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	1145	992	1526	0
V/C Ratio(X)							0.00	0.00	0.35	0.18	0.29	0.00
Avail Cap(c_a), veh/h							0	0	1145	992	1526	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh							0.0	0.0	0.4	4.9	4.0	0.0
Incr Delay (d2), s/veh							0.0	0.0	0.8	0.4	0.5	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	0.9	1.4	3.6	0.0
LnGrp Delay(d),s/veh							0.0	0.0	1.3	5.3	4.5	0.0
LnGrp LOS									A	A	A	
Approach Vol, veh/h								402			625	
Approach Delay, s/veh								1.3			4.7	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				34.0				34.0				
Change Period (Y+Rc), s				4.6				4.6				
Max Green Setting (Gmax), s				29.4				29.4				
Max Q Clear Time (g_c+I1), s				8.9				4.0				
Green Ext Time (p_c), s				1.8				1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			3.4									
HCM 2010 LOS			A									













HCM 2010 Signalized Intersection Summary
 22: C & 2nd

Baseline Conditions
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑↑				
Traffic Volume (veh/h)	185	1915	0	0	0	0	0	245	120	0	0	0
Future Volume (veh/h)	185	1915	0	0	0	0	0	245	120	0	0	0
Number	1	6	16				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1440	1500	0				0	1500	1440			
Adj Flow Rate, veh/h	193	1995	0				0	255	120			
Adj No. of Lanes	0	3	0				0	2	0			
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0				0	2	2			
Cap, veh/h	251	2157	0				0	626	284			
Arrive On Green	0.19	0.19	0.00				0.00	0.32	0.32			
Sat Flow, veh/h	344	3800	0				0	1940	881			
Grp Volume(v), veh/h	762	1426	0				0	195	180			
Grp Sat Flow(s),veh/h/ln	1414	1365	0				0	1500	1322			
Q Serve(g_s), s	40.9	41.0	0.0				0.0	8.1	8.5			
Cycle Q Clear(g_c), s	42.6	41.0	0.0				0.0	8.1	8.5			
Prop In Lane	0.25		0.00				0.00		0.67			
Lane Grp Cap(c), veh/h	859	1549	0				0	484	426			
V/C Ratio(X)	0.89	0.92	0.00				0.00	0.40	0.42			
Avail Cap(c_a), veh/h	859	1549	0				0	484	426			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	31.3	30.7	0.0				0.0	21.1	21.3			
Incr Delay (d2), s/veh	13.1	10.4	0.0				0.0	2.5	3.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	19.9	17.8	0.0				0.0	3.7	3.5			
LnGrp Delay(d),s/veh	44.5	41.1	0.0				0.0	23.6	24.3			
LnGrp LOS	D	D						C	C			
Approach Vol, veh/h		2188						375				
Approach Delay, s/veh		42.3						23.9				
Approach LOS		D						C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				30.0		50.0						
Change Period (Y+Rc), s				* 4.2		4.6						
Max Green Setting (Gmax), s				* 26		45.4						
Max Q Clear Time (g_c+I1), s				10.5		44.6						
Green Ext Time (p_c), s				2.8		0.8						
Intersection Summary												
HCM 2010 Ctrl Delay			39.6									
HCM 2010 LOS			D									
Notes												






















HCM 2010 Signalized Intersection Summary
 23: B & 2nd

Baseline Conditions
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑		↑	↑	
Traffic Volume (veh/h)	0	1960	80	0	0	0	0	0	230	200	270	0
Future Volume (veh/h)	0	1960	80	0	0	0	0	0	230	200	270	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.95	0.98		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1500	1382				0	1588	1591	1560	1500	0
Adj Flow Rate, veh/h	0	2042	78				0	0	224	208	281	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	0	0	0				0	0	1101	1057	1282	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.85	0.28	0.28	0.00
Sat Flow, veh/h		0					0	0	1288	1001	1500	0
Grp Volume(v), veh/h		0.0					0	0	224	208	281	0
Grp Sat Flow(s),veh/h/ln							0	0	1288	1001	1500	0
Q Serve(g_s), s							0.0	0.0	0.9	5.0	4.4	0.0
Cycle Q Clear(g_c), s							0.0	0.0	0.9	6.0	4.4	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	1101	1057	1282	0
V/C Ratio(X)							0.00	0.00	0.20	0.20	0.22	0.00
Avail Cap(c_a), veh/h							0	0	1101	1057	1282	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(l)							0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh							0.0	0.0	0.4	4.1	3.2	0.0
Incr Delay (d2), s/veh							0.0	0.0	0.4	0.4	0.4	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	0.4	1.5	2.0	0.0
LnGrp Delay(d),s/veh							0.0	0.0	0.8	4.5	3.6	0.0
LnGrp LOS									A	A	A	
Approach Vol, veh/h								224			489	
Approach Delay, s/veh								0.8			4.0	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				31.0				31.0				
Change Period (Y+Rc), s				4.5				4.5				
Max Green Setting (Gmax), s				26.5				26.5				
Max Q Clear Time (g_c+I1), s				8.0				2.9				
Green Ext Time (p_c), s				1.4				0.6				
Intersection Summary												
HCM 2010 Ctrl Delay			3.0									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary
24: A & 2nd

Baseline Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						  			 	
Traffic Volume (veh/h)	100	2115	175	0	0	0	0	305	30	110	130	0
Future Volume (veh/h)	100	2115	175	0	0	0	0	305	30	110	130	0
Number	5	2	12				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95				1.00		0.92	0.96		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1765	1800				0	1676	1710	1676	1744	0
Adj Flow Rate, veh/h	104	2203	171				0	318	22	115	135	0
Adj No. of Lanes	0	3	0				0	2	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	116	2596	205				0	629	43	255	543	0
Arrive On Green	0.19	0.19	0.19				0.00	0.21	0.21	0.03	0.21	0.00
Sat Flow, veh/h	200	4488	355				0	3088	206	1597	1744	0
Grp Volume(v), veh/h	911	756	811				0	167	173	115	135	0
Grp Sat Flow(s),veh/h/ln	1755	1606	1682				0	1593	1618	1597	1744	0
Q Serve(g_s), s	40.6	36.2	37.2				0.0	7.4	7.6	0.0	5.2	0.0
Cycle Q Clear(g_c), s	40.6	36.2	37.2				0.0	7.4	7.6	0.0	5.2	0.0
Prop In Lane	0.11		0.21				0.00		0.13	1.00		0.00
Lane Grp Cap(c), veh/h	1015	929	973				0	334	339	255	543	0
V/C Ratio(X)	0.90	0.81	0.83				0.00	0.50	0.51	0.45	0.25	0.00
Avail Cap(c_a), veh/h	1015	929	973				0	334	339	255	543	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.1	28.3	28.7				0.0	28.0	28.1	34.1	23.9	0.0
Incr Delay (d2), s/veh	12.2	7.8	8.3				0.0	5.3	5.4	5.7	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	23.2	18.1	19.6				0.0	3.7	3.9	2.9	2.7	0.0
LnGrp Delay(d),s/veh	42.3	36.1	37.0				0.0	33.3	33.4	39.8	25.0	0.0
LnGrp LOS	D	D	D					C	C	D	C	
Approach Vol, veh/h		2478						340			250	
Approach Delay, s/veh		38.7						33.4			31.8	
Approach LOS		D						C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		51.0		29.2			8.2	21.0				
Change Period (Y+Rc), s		4.6		* 4.2			* 4.2	* 4.2				
Max Green Setting (Gmax), s		46.4		* 25			* 4	* 17				
Max Q Clear Time (g_c+I1), s		42.6		7.2			2.0	9.6				
Green Ext Time (p_c), s		3.7		0.9			0.1	1.5				
Intersection Summary												
HCM 2010 Ctrl Delay			37.5									
HCM 2010 LOS			D									
Notes												

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

BioMarin
Baseline Conditions
PM Peak Hour

Intersection 25 Brooks St/2nd St Side-street Stop


















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	75	70	93.2%	26.0	4.8	D
	Through						
	Right Turn						
	Subtotal	75	70	93.2%	26.0	4.8	D
EB	Left Turn	45	43	96.5%	3.1	0.4	A
	Through	2,245	2,176	96.9%	2.6	0.2	A
	Right Turn						
	Subtotal	2,290	2,219	96.9%	2.6	0.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,365	2,289	96.8%	3.4	0.4	A

Intersection 26 Lindaro St/2nd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	80	85	105.8%	18.2	2.3	B
	Right Turn	290	278	95.9%	18.1	3.6	B
	Subtotal	370	363	98.1%	18.2	2.6	B
SB	Left Turn	100	95	94.6%	22.4	4.9	C
	Through	170	153	90.1%	16.0	3.3	B
	Right Turn						
	Subtotal	270	248	91.7%	18.5	1.9	B
EB	Left Turn	50	49	97.2%	17.4	2.9	B
	Through	2,200	2,120	96.3%	15.1	0.9	B
	Right Turn	40	37	92.0%	7.8	4.2	A
	Subtotal	2,290	2,205	96.3%	15.0	0.9	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,930	2,816	96.1%	15.7	1.0	B



















HCM 2010 Signalized Intersection Summary
27: Lincoln & 2nd

Baseline Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	215	2265	50	0	0	0	0	200	130	130	180	0
Future Volume (veh/h)	215	2265	50	0	0	0	0	200	130	130	180	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1412	1412				0	1412	1412	1382	1355	0
Adj Flow Rate, veh/h	224	2359	29				0	208	125	135	188	0
Adj No. of Lanes	0	4	1				0	1	1	0	2	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	223	2533	642				0	491	404	257	439	0
Arrive On Green	0.18	0.18	0.18				0.00	0.35	0.35	0.69	0.69	0.00
Sat Flow, veh/h	408	4626	1172				0	1412	1162	496	1324	0
Grp Volume(v), veh/h	765	1818	29				0	208	125	156	167	0
Grp Sat Flow(s),veh/h/ln	1391	1214	1172				0	1412	1162	587	1172	0
Q Serve(g_s), s	43.8	39.2	1.6				0.0	9.0	6.3	11.6	4.9	0.0
Cycle Q Clear(g_c), s	43.8	39.2	1.6				0.0	9.0	6.3	20.6	4.9	0.0
Prop In Lane	0.29		1.00				0.00		1.00	0.87		0.00
Lane Grp Cap(c), veh/h	762	1994	642				0	491	404	288	407	0
V/C Ratio(X)	1.00	0.91	0.05				0.00	0.42	0.31	0.54	0.41	0.00
Avail Cap(c_a), veh/h	762	1994	642				0	491	404	288	407	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.8	30.9	15.5				0.0	20.0	19.1	14.3	8.7	0.0
Incr Delay (d2), s/veh	33.5	7.8	0.1				0.0	2.7	2.0	7.1	3.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	24.0	14.6	0.6				0.0	3.9	2.2	3.3	1.8	0.0
LnGrp Delay(d),s/veh	66.3	38.7	15.6				0.0	22.6	21.1	21.4	11.8	0.0
LnGrp LOS	F	D	B					C	C	C	B	
Approach Vol, veh/h		2612						333			323	
Approach Delay, s/veh		46.5						22.1			16.4	
Approach LOS		D						C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		48.0		32.0				32.0				
Change Period (Y+Rc), s		* 4.2		* 4.2				* 4.2				
Max Green Setting (Gmax), s		* 44		* 28				* 28				
Max Q Clear Time (g_c+I1), s		45.8		11.0				22.6				
Green Ext Time (p_c), s		0.0		1.3				0.7				
Intersection Summary												
HCM 2010 Ctrl Delay			41.0									
HCM 2010 LOS			D									
Notes												

















HCM 2010 Signalized Intersection Summary
28: Francisco W./Tamalpais & 2nd

Baseline Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	2375	120	0	0	0	0	140	340	85	235	0
Future Volume (veh/h)	30	2375	120	0	0	0	0	140	340	85	235	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1412	1412				0	1412	1468	1412	1412	0
Adj Flow Rate, veh/h	31	2474	76				0	146	319	89	245	0
Adj No. of Lanes	0	4	1				0	1	1	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	32	2738	614				0	408	351	243	408	0
Arrive On Green	0.18	0.18	0.18				0.00	0.29	0.29	0.58	0.58	0.00
Sat Flow, veh/h	58	4993	1119				0	1412	1216	738	1412	0
Grp Volume(v), veh/h	747	1758	76				0	146	319	89	245	0
Grp Sat Flow(s),veh/h/ln	1409	1214	1119				0	1412	1216	738	1412	0
Q Serve(g_s), s	42.1	37.6	4.6				0.0	6.6	20.2	7.4	9.0	0.0
Cycle Q Clear(g_c), s	42.1	37.6	4.6				0.0	6.6	20.2	14.0	9.0	0.0
Prop In Lane	0.04		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	773	1998	614				0	408	351	243	408	0
V/C Ratio(X)	0.97	0.88	0.12				0.00	0.36	0.91	0.37	0.60	0.00
Avail Cap(c_a), veh/h	773	1998	614				0	468	403	274	468	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	0.09	0.09	0.09				0.00	1.00	1.00	0.97	0.97	0.00
Uniform Delay (d), s/veh	32.0	30.2	16.7				0.0	22.6	27.4	17.5	13.9	0.0
Incr Delay (d2), s/veh	4.7	0.6	0.0				0.0	0.5	22.1	0.9	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.5	12.8	1.4				0.0	2.6	8.9	1.5	3.6	0.0
LnGrp Delay(d),s/veh	36.7	30.8	16.7				0.0	23.1	49.5	18.4	15.5	0.0
LnGrp LOS	D	C	B					C	D	B	B	
Approach Vol, veh/h		2581						465			334	
Approach Delay, s/veh		32.1						41.2			16.3	
Approach LOS		C						D			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		50.4		29.6				29.6				
Change Period (Y+Rc), s		6.5		6.5				6.5				
Max Green Setting (Gmax), s		40.5		26.5				26.5				
Max Q Clear Time (g_c+I1), s		44.1		22.2				16.0				
Green Ext Time (p_c), s		0.0		0.9				1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			31.8									
HCM 2010 LOS			C									





















HCM 2010 Signalized Intersection Summary
 29: 101 SBO on Hetherton/Hetherton & 2nd/2nd St

Baseline Conditions
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1790	1005	0	0	0	0	0	0	365	780	0
Future Volume (veh/h)	0	1790	1005	0	0	0	0	0	0	365	780	0
Number	5	2	12							7	4	14
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1500	1500							1500	1500	0
Adj Flow Rate, veh/h	0	1808	1016							380	812	0
Adj No. of Lanes	0	3	2							1	2	0
Peak Hour Factor	0.96	0.96	0.96							0.96	0.96	0.96
Percent Heavy Veh, %	0	2	2							2	2	0
Cap, veh/h	0	2268	1285							476	1000	0
Arrive On Green	0.00	0.17	0.17							0.11	0.11	0.00
Sat Flow, veh/h	0	4500	2550							1429	3000	0
Grp Volume(v), veh/h	0	1808	1016							380	812	0
Grp Sat Flow(s),veh/h/ln	0	1500	1275							1429	1500	0
Q Serve(g_s), s	0.0	30.9	30.6							20.8	21.2	0.0
Cycle Q Clear(g_c), s	0.0	30.9	30.6							20.8	21.2	0.0
Prop In Lane	0.00		1.00							1.00		0.00
Lane Grp Cap(c), veh/h	0	2268	1285							476	1000	0
V/C Ratio(X)	0.00	0.80	0.79							0.80	0.81	0.00
Avail Cap(c_a), veh/h	0	2268	1285							545	1144	0
HCM Platoon Ratio	1.00	0.33	0.33							0.33	0.33	1.00
Upstream Filter(I)	0.00	0.18	0.18							0.88	0.88	0.00
Uniform Delay (d), s/veh	0.0	29.4	29.3							33.0	33.1	0.0
Incr Delay (d2), s/veh	0.0	0.6	1.0							6.5	3.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.0	11.0							9.1	9.3	0.0
LnGrp Delay(d),s/veh	0.0	30.0	30.2							39.4	36.7	0.0
LnGrp LOS		C	C							D	D	
Approach Vol, veh/h		2824									1192	
Approach Delay, s/veh		30.1									37.6	
Approach LOS		C									D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		48.8		31.2								
Change Period (Y+Rc), s		8.5		4.5								
Max Green Setting (Gmax), s		36.5		30.5								
Max Q Clear Time (g_c+I1), s		32.9		23.2								
Green Ext Time (p_c), s		3.4		3.5								
Intersection Summary												
HCM 2010 Ctrl Delay			32.3									
HCM 2010 LOS			C									
Notes												






















HCM 2010 Signalized Intersection Summary
30: Irwin & 2nd St

Baseline Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						  				
Traffic Volume (veh/h)	900	1305	0	0	0	0	0	1380	560	0	0	0
Future Volume (veh/h)	900	1305	0	0	0	0	0	1380	560	0	0	0
Number	5	2	12				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.94			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1468	1500	0				0	1412	1412			
Adj Flow Rate, veh/h	1002	1270	0				0	1438	571			
Adj No. of Lanes	2	2	0				0	3	1			
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0				0	2	2			
Cap, veh/h	1501	1418	0				0	1580	464			
Arrive On Green	0.16	0.16	0.00				0.00	0.41	0.41			
Sat Flow, veh/h	2797	3000	0				0	3981	1132			
Grp Volume(v), veh/h	1002	1270	0				0	1438	571			
Grp Sat Flow(s),veh/h/ln	1398	1500	0				0	1285	1132			
Q Serve(g_s), s	27.4	33.2	0.0				0.0	28.1	32.8			
Cycle Q Clear(g_c), s	27.4	33.2	0.0				0.0	28.1	32.8			
Prop In Lane	1.00		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	1501	1418	0				0	1580	464			
V/C Ratio(X)	0.67	0.90	0.00				0.00	0.91	1.23			
Avail Cap(c_a), veh/h	1501	1418	0				0	1580	464			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	29.4	31.8	0.0				0.0	22.2	23.6			
Incr Delay (d2), s/veh	2.4	9.1	0.0				0.0	9.4	121.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	11.1	15.6	0.0				0.0	11.2	25.8			
LnGrp Delay(d),s/veh	31.8	41.0	0.0				0.0	31.6	145.1			
LnGrp LOS	C	D						C	F			
Approach Vol, veh/h		2272						2009				
Approach Delay, s/veh		36.9						63.8				
Approach LOS		D						E				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		42.0		38.0								
Change Period (Y+Rc), s		* 4.2		* 5.2								
Max Green Setting (Gmax), s		* 38		* 33								
Max Q Clear Time (g_c+I1), s		35.2		34.8								
Green Ext Time (p_c), s		2.5		0.0								
Intersection Summary												
HCM 2010 Ctrl Delay			49.5									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary
31: Lindaro & Andersen

Baseline Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	280	40	70	280	50	60	220	170	90	130	30
Future Volume (veh/h)	20	280	40	70	280	50	60	220	170	90	130	30
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.96	1.00		0.93
Parking Bus, Adj	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 Sat Flow, veh/h/ln	2039	2039	2000	1961	1961	2000	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	21	292	35	73	292	45	62	229	145	94	135	22
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	58	389	47	155	449	69	271	302	191	213	395	64
Arrive On Green	0.03	0.22	0.22	0.08	0.27	0.27	0.15	0.29	0.29	0.12	0.26	0.26
Sat Flow, veh/h	1942	1778	213	1867	1650	254	1774	1047	663	1774	1543	251
Grp Volume(v), veh/h	21	0	327	73	0	337	62	0	374	94	0	157
Grp Sat Flow(s),veh/h/ln	1942	0	1991	1867	0	1904	1774	0	1711	1774	0	1795
Q Serve(g_s), s	0.6	0.0	9.1	2.2	0.0	9.2	1.8	0.0	11.7	2.9	0.0	4.2
Cycle Q Clear(g_c), s	0.6	0.0	9.1	2.2	0.0	9.2	1.8	0.0	11.7	2.9	0.0	4.2
Prop In Lane	1.00		0.11	1.00		0.13	1.00		0.39	1.00		0.14
Lane Grp Cap(c), veh/h	58	0	436	155	0	518	271	0	493	213	0	459
V/C Ratio(X)	0.37	0.00	0.75	0.47	0.00	0.65	0.23	0.00	0.76	0.44	0.00	0.34
Avail Cap(c_a), veh/h	263	0	841	317	0	868	301	0	667	301	0	700
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.1	0.0	21.5	25.8	0.0	19.0	21.9	0.0	19.1	24.1	0.0	17.9
Incr Delay (d2), s/veh	1.4	0.0	2.6	0.8	0.0	1.4	0.2	0.0	3.4	0.5	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	5.2	1.2	0.0	5.1	0.9	0.0	6.0	1.4	0.0	2.1
LnGrp Delay(d),s/veh	29.5	0.0	24.1	26.6	0.0	20.4	22.1	0.0	22.5	24.7	0.0	18.3
LnGrp LOS	C		C	C		C	C		C	C		B
Approach Vol, veh/h		348			410			436			251	
Approach Delay, s/veh		24.5			21.5			22.5			20.7	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	17.8	13.0	19.3	5.7	20.9	11.1	21.2				
Change Period (Y+Rc), s	4.0	4.9	4.0	* 4.2	4.0	4.9	4.0	* 4.2				
Max Green Setting (Gmax), s	10.0	24.9	10.0	* 23	8.0	26.9	10.0	* 23				
Max Q Clear Time (g_c+I1), s	4.2	11.1	3.8	6.2	2.6	11.2	4.9	13.7				
Green Ext Time (p_c), s	0.0	1.1	0.0	0.5	0.0	1.2	0.1	1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			22.4									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis
 32: Tamalpais & Mission

Baseline Conditions
 Timing Plan: PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	
Traffic Volume (vph)	490	50	0	635	10	25
Future Volume (vph)	490	50	0	635	10	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0			3.0	5.6	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	0.99	
Frt	0.99			1.00	0.90	
Flt Protected	1.00			1.00	0.99	
Satd. Flow (prot)	1561			1588	1401	
Flt Permitted	1.00			1.00	0.99	
Satd. Flow (perm)	1561			1588	1401	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	510	52	0	661	10	26
RTOR Reduction (vph)	5	0	0	0	21	0
Lane Group Flow (vph)	557	0	0	661	15	0
Confl. Peds. (#/hr)		10	10		10	
Turn Type	NA			NA	Perm	
Protected Phases	2			3 4 6		
Permitted Phases					8	
Actuated Green, G (s)	34.1			54.9	13.9	
Effective Green, g (s)	34.1			48.9	13.9	
Actuated g/C Ratio	0.43			0.61	0.17	
Clearance Time (s)	6.0				5.6	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	665			970	243	
v/s Ratio Prot	c0.36			c0.42		
v/s Ratio Perm					c0.01	
v/c Ratio	0.84			0.68	0.06	
Uniform Delay, d1	20.5			10.4	27.6	
Progression Factor	0.64			0.35	0.72	
Incremental Delay, d2	10.7			0.5	0.1	
Delay (s)	23.9			4.2	20.0	
Level of Service	C			A	C	
Approach Delay (s)	23.9			4.2	20.0	
Approach LOS	C			A	C	

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

33: Tamalpais & 5th

Baseline Conditions

Timing Plan: PM Peak Hour



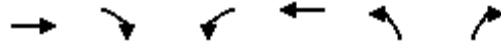
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Traffic Volume (vph)	0	455	5	0	290	15	30	25	20	10	20	20
Future Volume (vph)	0	455	5	0	290	15	30	25	20	10	20	20
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			1.00			1.00			0.98	
Flpb, ped/bikes		1.00			1.00			0.99			1.00	
Frt		1.00			0.99			0.96			0.95	
Flt Protected		1.00			1.00			0.98			0.99	
Satd. Flow (prot)		1585			1574			1487			1461	
Flt Permitted		1.00			1.00			0.85			0.92	
Satd. Flow (perm)		1585			1574			1285			1356	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	474	5	0	302	16	31	26	21	10	21	21
RTOR Reduction (vph)	0	0	0	0	2	0	0	19	0	0	19	0
Lane Group Flow (vph)	0	479	0	0	316	0	0	59	0	0	33	0
Confl. Peds. (#/hr)	10		10	10		10	10					10
Turn Type		NA			NA		Perm	NA		Perm	NA	
Protected Phases		2			4	6		8			8	
Permitted Phases							8			8		
Actuated Green, G (s)		43.0			58.8			9.2			9.2	
Effective Green, g (s)		43.0			58.8			9.2			9.2	
Actuated g/C Ratio		0.54			0.73			0.11			0.11	
Clearance Time (s)		6.0						6.0			6.0	
Vehicle Extension (s)		3.0						1.5			1.5	
Lane Grp Cap (vph)		851			1156			147			155	
v/s Ratio Prot		c0.30			c0.20							
v/s Ratio Perm								c0.05			0.02	
v/c Ratio		0.56			0.27			0.40			0.22	
Uniform Delay, d1		12.3			3.5			32.9			32.1	
Progression Factor		0.58			0.05			0.38			0.84	
Incremental Delay, d2		2.3			0.0			0.6			0.1	
Delay (s)		9.4			0.2			13.0			27.1	
Level of Service		A			A			B			C	
Approach Delay (s)		9.4			0.2			13.0			27.1	
Approach LOS		A			A			B			C	

Intersection Summary

HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 34: Tamalpais & Mission

Baseline Conditions
 Timing Plan: PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Traffic Volume (vph)	515	0	0	625	10	25
Future Volume (vph)	515	0	0	625	10	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0			6.0	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.90	
Flt Protected	1.00			1.00	0.99	
Satd. Flow (prot)	1588			1588	1414	
Flt Permitted	1.00			1.00	0.99	
Satd. Flow (perm)	1588			1588	1414	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	536	0	0	651	10	26
RTOR Reduction (vph)	0	0	0	0	21	0
Lane Group Flow (vph)	536	0	0	651	15	0
Confl. Peds. (#/hr)		10				
Turn Type	NA			NA	Prot	
Protected Phases	2 8			6	3 4	
Permitted Phases						
Actuated Green, G (s)	53.6			34.1	14.8	
Effective Green, g (s)	48.0			34.1	14.8	
Actuated g/C Ratio	0.60			0.43	0.19	
Clearance Time (s)				6.0		
Vehicle Extension (s)				3.0		
Lane Grp Cap (vph)	952			676	261	
v/s Ratio Prot	c0.34			c0.41	c0.01	
v/s Ratio Perm						
v/c Ratio	0.56			0.96	0.06	
Uniform Delay, d1	9.7			22.3	26.9	
Progression Factor	0.29			1.04	1.82	
Incremental Delay, d2	0.4			20.9	0.0	
Delay (s)	3.3			44.0	48.9	
Level of Service	A			D	D	
Approach Delay (s)	3.3			44.0	48.9	
Approach LOS	A			D	D	

Intersection Summary			
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

35: Tamalpais & 5th

Baseline Conditions

Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑			↑				
Traffic Volume (vph)	0	485	0	0	285	15	20	20	20	0	0	0
Future Volume (vph)	0	485	0	0	285	15	20	20	20	0	0	0
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		1.00			1.00			1.00				
Frbp, ped/bikes		1.00			1.00			0.99				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.99			0.95				
Flt Protected		1.00			1.00			0.98				
Satd. Flow (prot)		1588			1573			1470				
Flt Permitted		1.00			1.00			0.98				
Satd. Flow (perm)		1588			1573			1470				
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	505	0	0	297	16	21	21	21	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	18	0	0	0	0
Lane Group Flow (vph)	0	505	0	0	311	0	0	45	0	0	0	0
Confl. Peds. (#/hr)	10		10			10			10			
Turn Type		NA			NA		Split	NA				
Protected Phases		2 8			6		4	4				
Permitted Phases												
Actuated Green, G (s)		58.2			43.0			9.8				
Effective Green, g (s)		58.2			43.0			9.8				
Actuated g/C Ratio		0.73			0.54			0.12				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			1.5				
Lane Grp Cap (vph)		1155			845			180				
v/s Ratio Prot		c0.32			0.20			c0.03				
v/s Ratio Perm												
v/c Ratio		0.44			0.37			0.25				
Uniform Delay, d1		4.4			10.7			31.8				
Progression Factor		0.09			0.52			1.01				
Incremental Delay, d2		0.1			1.2			0.2				
Delay (s)		0.5			6.7			32.3				
Level of Service		A			A			C				
Approach Delay (s)		0.5			6.7			32.3			0.0	
Approach LOS		A			A			C			A	
Intersection Summary												
HCM 2000 Control Delay			4.9									A
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			80.0						18.0			
Intersection Capacity Utilization			46.8%									A
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 36: Tamalpais & 4th

Baseline Conditions
 Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑			↑			↑					
Traffic Volume (vph)	0	370	0	0	425	50	20	5	20	0	0	0	
Future Volume (vph)	0	370	0	0	425	50	20	5	20	0	0	0	
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Total Lost time (s)		6.0			6.0			6.0					
Lane Util. Factor		1.00			1.00			1.00					
Frbp, ped/bikes		1.00			0.98			0.99					
Flpb, ped/bikes		1.00			1.00			1.00					
Frt		1.00			0.99			0.94					
Flt Protected		1.00			1.00			0.98					
Satd. Flow (prot)		1588			1537			1442					
Flt Permitted		1.00			1.00			0.98					
Satd. Flow (perm)		1588			1537			1442					
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0	385	0	0	443	52	21	5	21	0	0	0	
RTOR Reduction (vph)	0	0	0	0	5	0	0	18	0	0	0	0	
Lane Group Flow (vph)	0	385	0	0	490	0	0	29	0	0	0	0	
Confl. Peds. (#/hr)	59		21			59			10				
Turn Type		NA			NA		Split	NA					
Protected Phases		2 8			6		4	4					
Permitted Phases													
Actuated Green, G (s)		55.1			36.8			13.3					
Effective Green, g (s)		55.1			36.8			13.3					
Actuated g/C Ratio		0.69			0.46			0.17					
Clearance Time (s)					6.0			6.0					
Vehicle Extension (s)					3.0			3.0					
Lane Grp Cap (vph)		1093			707			239					
v/s Ratio Prot		c0.24			c0.32			c0.02					
v/s Ratio Perm													
v/c Ratio		0.35			0.69			0.12					
Uniform Delay, d1		5.1			17.1			28.4					
Progression Factor		0.21			0.78			1.01					
Incremental Delay, d2		0.2			5.0			0.2					
Delay (s)		1.3			18.4			28.9					
Level of Service		A			B			C					
Approach Delay (s)		1.3			18.4			28.9			0.0		
Approach LOS		A			B			C			A		
Intersection Summary													
HCM 2000 Control Delay			11.8									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.52										
Actuated Cycle Length (s)			80.0									Sum of lost time (s)	17.6
Intersection Capacity Utilization			49.2%									ICU Level of Service	A
Analysis Period (min)			15										
c Critical Lane Group													

Arterial Level of Service: EB 2nd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
D	IV	25	18.1	28.1	46.2	0.07	5.3	F
C	IV	25	18.9	11.5	30.4	0.07	8.5	E
B	IV	25	17.9	43.2	61.1	0.07	4.0	F
A	IV	25	18.5	12.3	30.8	0.07	8.1	E
Lindaro	IV	25	25.3	18.1	43.4	0.14	11.6	D
Lincoln	IV	25	21.4	57.0	78.4	0.10	4.5	F
Francisco W.	IV	25	12.2	30.8	43.0	0.05	3.9	F
101 SBO on 2nd	IV	25	14.2	22.1	36.3	0.05	5.3	F
Total	IV		146.5	223.1	369.6	0.61	6.0	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	24.0	43.0	0.07	6.0	F
Tamalpais	IV	25	14.4	34.9	49.3	0.05	4.0	F
Lincoln	IV	25	13.2	17.0	30.2	0.05	6.0	F
Lindaro	IV	25	21.4	3.2	24.6	0.10	14.2	C
A	IV	25	25.3	15.5	40.8	0.14	12.4	D
B	IV	25	17.9	8.8	26.7	0.07	9.1	D
C	IV	25	19.0	4.5	23.5	0.07	11.0	D
D	IV	25	18.7	2.6	21.3	0.07	11.9	D
Total	IV		148.9	110.5	259.4	0.62	8.7	E

Arterial Level of Service: SB Hetherton

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Mission	IV	29	24.0	42.9	66.9	0.16	8.6	E
5th	IV	25	16.3	3.3	19.6	0.06	11.3	D
4th	IV	25	14.6	6.3	20.9	0.05	9.5	D
3rd	IV	25	17.7	10.2	27.9	0.07	8.6	E
2nd	IV	25	15.6	75.4	91.0	0.06	2.3	F
Total	IV		88.2	138.1	226.3	0.40	6.4	F

Arterial Level of Service: NB Irwin

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
2nd St	IV	30	25.2	28.2	53.4	0.17	11.3	D
3rd St	IV	25	14.8	17.2	32.0	0.06	6.3	F
4th	IV	25	18.3	17.7	36.0	0.07	6.9	F
5th	IV	25	14.6	9.7	24.3	0.06	8.2	E
Mission	IV	25	15.7	6.0	21.7	0.06	9.8	D
Total	IV		88.6	78.8	167.4	0.41	8.8	E

Arterial Level of Service: EB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lincoln	IV	25	28.5	14.6	43.1	0.16	13.2	C
Tamalpais	IV	25	16.0	49.8	65.8	0.06	3.3	F
Tamalpais	IV	25	3.1	5.7	8.8	0.01	4.8	F
Hetherton	IV	25	8.7	10.2	18.9	0.03	6.3	F
Irwin	IV	25	18.9	14.7	33.6	0.07	7.6	E
Total	IV		75.2	95.0	170.2	0.33	7.1	E

Arterial Level of Service: WB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Irwin	IV	25	21.6	27.6	49.2	0.10	7.2	E
Hetherton	IV	25	18.9	23.4	42.3	0.07	6.1	F
Tamalpais	IV	25	8.7	115.6	124.3	0.03	1.0	F
Tamalpais	IV	25	3.1	4.7	7.8	0.01	5.4	F
Lincoln	IV	25	16.0	80.8	96.8	0.06	2.2	F
Total	IV		68.3	252.1	320.4	0.27	3.1	F

Arterial Level of Service: EB 2nd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
D	IV	25	18.1	17.6	35.7	0.07	6.9	F
C	IV	25	18.9	13.8	32.7	0.07	7.9	E
B	IV	25	17.9	14.9	32.8	0.07	7.4	E
A	IV	25	18.5	12.1	30.6	0.07	8.2	E
Lindaro	IV	25	25.3	12.3	37.6	0.14	13.4	C
Lincoln	IV	25	21.4	36.4	57.8	0.10	6.1	F
Francisco W.	IV	25	12.2	19.0	31.2	0.05	5.3	F
101 SBO n Hetherton	IV	25	14.2	61.0	75.2	0.05	2.6	F
Total	IV		146.5	187.1	333.6	0.61	6.6	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	40.6	59.6	0.07	4.3	F
Tamalpais	IV	25	14.4	49.9	64.3	0.05	3.0	F
Lincoln	IV	25	13.2	17.8	31.0	0.05	5.8	F
Lindaro	IV	25	21.4	4.6	26.0	0.10	13.5	C
A	IV	25	25.3	6.1	31.4	0.14	16.1	C
B	IV	25	17.9	7.1	25.0	0.07	9.7	D
C	IV	25	19.0	4.3	23.3	0.07	11.1	D
D	IV	25	18.7	2.9	21.6	0.07	11.7	D
Total	IV		148.9	133.3	282.2	0.62	8.0	E

Arterial Level of Service: SB Hetherton

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Mission	IV	35	22.2	35.6	57.8	0.16	9.9	D
5th	IV	25	16.3	6.7	23.0	0.06	9.6	D
4th	IV	25	14.6	7.4	22.0	0.05	9.0	E
3rd	IV	25	17.7	22.8	40.5	0.07	5.9	F
2nd	IV	25	15.6	25.7	41.3	0.06	5.1	F
Total	IV		86.4	98.2	184.6	0.40	7.8	E

Arterial Level of Service: NB Irwin

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
2nd St	IV	38	19.3	32.5	51.8	0.17	11.7	D
3rd St	IV	25	14.8	17.3	32.1	0.06	6.2	F
4th	IV	25	18.9	3.7	22.6	0.07	11.4	D
5th	IV	25	14.0	12.5	26.5	0.05	7.2	E
Mission	IV	25	15.7	3.2	18.9	0.06	11.3	D
Total	IV		82.7	69.2	151.9	0.41	9.7	D

Arterial Level of Service: EB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lincoln	IV	25	28.5	12.1	40.6	0.16	14.0	C
Tamalpais	IV	25	16.1	25.9	42.0	0.06	5.2	F
Tamalpais	IV	25	4.3	3.1	7.4	0.02	7.9	E
Hetherton	IV	25	7.5	8.0	15.5	0.03	6.6	F
Irwin	IV	25	18.9	14.4	33.3	0.07	7.7	E
Total	IV		75.3	63.5	138.8	0.33	8.7	E

Arterial Level of Service: WB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Irwin	IV	25	21.6	30.4	52.0	0.10	6.8	F
Hetherton	IV	25	18.9	8.3	27.2	0.07	9.4	D
Tamalpais	IV	25	7.5	46.6	54.1	0.03	1.9	F
Tamalpais	IV	25	4.3	2.7	7.0	0.02	8.4	E
Lincoln	IV	25	16.1	31.9	48.0	0.06	4.6	F
Total	IV		68.4	119.9	188.3	0.27	5.3	F

Leisch Method for Weaving Analysis

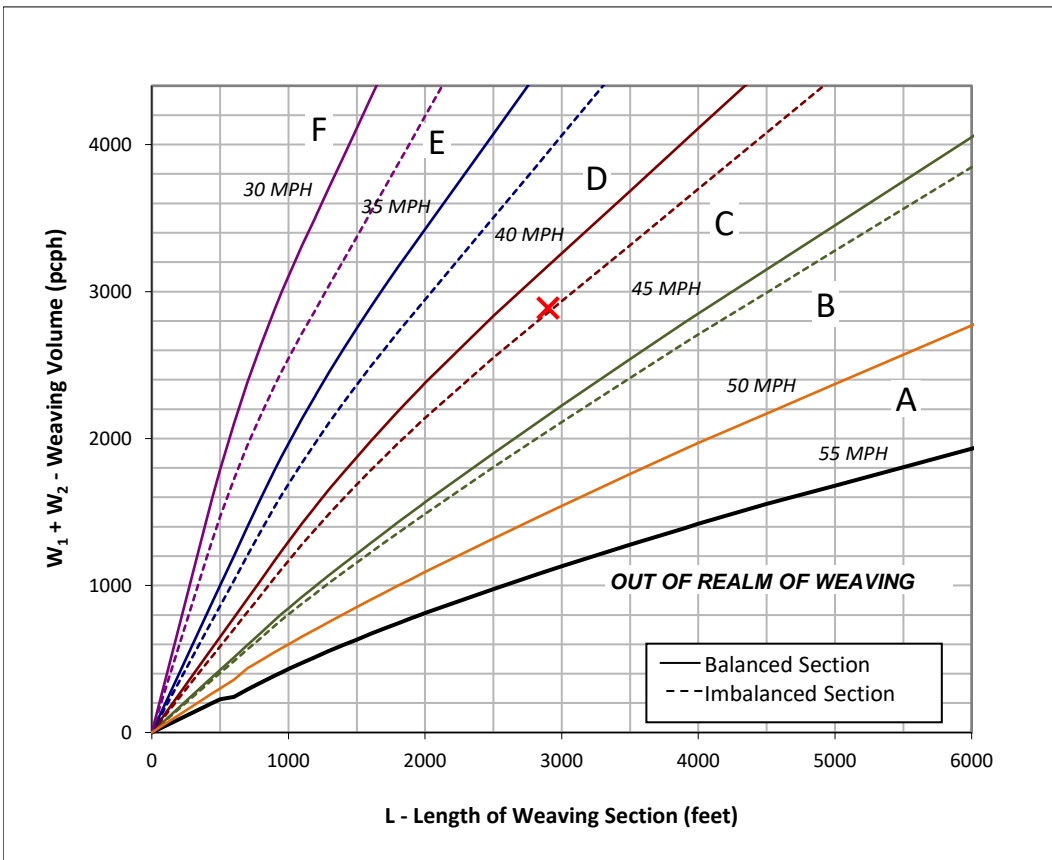
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	5
Length of Weaving Section (feet)	L	2,900

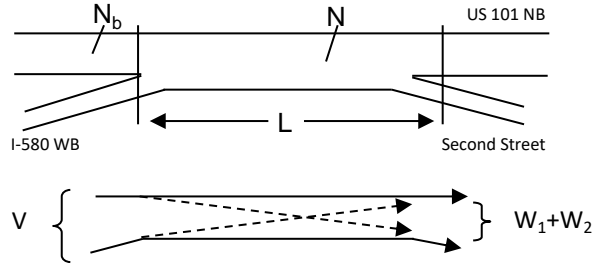
Project Information

Project	BioMarin
Scenario	Baseline AM Peak Hour
Freeway	US 101 NB
On-ramp	I-580 WB
Off-ramp	Second Street

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	5,707	Volume (vph)*	1,754	Volume (vph)*	1,016
Truck Percentage	4%	Truck Percentage	4%	Truck Percentage	4%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	2.0
Volume (pcph)	5,958	Volume (pcph)	1,831	Volume (pcph)	1,058



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
40 MPH and 45 MPH
 If left of the 30 MPH curve, LOS is F. Select "-".
 If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 39.8
- Weaving Intensity Factor (k) 2.54
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,517
- Level of Service (LOS) D

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Baseline Conditions
Project Description	BioMarin - US 101 NB Second Street to Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	3833	Heavy Vehicle Adjustment Factor (f_{HV})	0.919
Peak Hour Factor (PHF)	0.99	Flow Rate ($v_{p,GP}$), pc/h/ln	1404
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.61
Passenger Car Equivalent (E_T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	23.4
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	718	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	820
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.50
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.8
Speed 2 (S_2), mi/h	0.2	Density (D_{ML}), pc/mi/ln	13.7
Speed 2 (S_3), mi/h	1.4	Level of Service (LOS)	B

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Baseline Conditions
Project Description	BioMarin - US 101 NB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	4	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	2.86
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	1.02
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	5612	Heavy Vehicle Adjustment Factor (f_{HV})	0.889
Peak Hour Factor (PHF)	0.99	Flow Rate ($v_{p,GP}$), pc/h/ln	1594
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.69
Passenger Car Equivalent (E_T)	3.840		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	26.6
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	2.86

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1039	Heavy Vehicle Adjustment Factor (f_{HV})	0.916
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1246
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.76
Passenger Car Equivalent (E_T)	5.597		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	58.3
Speed 2 (S_2), mi/h	1.7	Density (D_{ML}), pc/mi/ln	21.4
Speed 2 (S_3), mi/h	7.7	Level of Service (LOS)	C

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	4/24/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Baseline Conditions
Project Description	BioMarin - US 101 SB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	-2.44
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	0.77
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	5803	Heavy Vehicle Adjustment Factor (f_{HV})	0.951
Peak Hour Factor (PHF)	0.97	Flow Rate ($v_{p,GP}$), pc/h/ln	2097
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.91
Passenger Car Equivalent (E_T)	2.180		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	55.5
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	37.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1317	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.94	Flow Rate ($V_{p,ML}$), pc/h/ln	1440
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (E_T)	2.390		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	1
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	44.8
Speed 2 (S_2), mi/h	3.0	Density (D_{ML}), pc/mi/ln	32.1
Speed 2 (S_3), mi/h	12.2	Level of Service (LOS)	D

HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	3/17/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour
Project Description	BioMarin - US 101 Mission Ave Slip Off-Ramp		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	3	1
Free-Flow Speed (FFS), mi/h	60.0	50.0
Segment Length (L) / Deceleration Length (L _D), ft	1500	170
Terrain Type	Specific Grade	Specific Grade
Percent Grade, %	-2.44	-1.80
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Volume (V _i), veh/h	5803	1448
Peak Hour Factor (PHF)	0.97	0.92
Total Trucks, %	4.40	3.72
Single-Unit Trucks (SUT), %	66	66
Tractor-Trailers (TT), %	34	34
Heavy Vehicle Adjustment Factor (f _{HV})	0.951	0.958
Flow Rate (v _i), pc/h	6291	1643
Capacity (c), pc/h	6900	2100
Volume-to-Capacity Ratio (v/c)	0.91	0.78

Speed and Density

Upstream Equilibrium Distance (L _{EQ}), ft	62470.8	Density in Ramp Influence Area (D _R), pc/mi/ln	37.9
Distance to Upstream Ramp (L _{UP}), ft	10000	Speed Index (D _S)	0.381
Downstream Equilibrium Distance (L _{EQ}), ft	-	Flow Outer Lanes (v _{OA}), pc/h/ln	2199
Distance to Downstream Ramp (L _{DOWN}), ft	10000	Off-Ramp Influence Area Speed (S _R), mi/h	53.1
Prop. Freeway Vehicles in Lane 1 and 2 (P _{FD})	0.527	Outer Lanes Freeway Speed (S _O), mi/h	61.1
Flow in Lanes 1 and 2 (v ₁₂), pc/h	4092	Ramp Junction Speed (S), mi/h	55.6
Flow Entering Ramp-Infl. Area (v _{R12}), pc/h	-	Average Density (D), pc/mi/ln	37.7
Level of Service (LOS)	E		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
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Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44
Managed Lane Adjustment Factors			
Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V _{ML}), veh/h	1317	Heavy Vehicle Adjustment Factor (f _{HV})	0.973
Peak Hour Factor	0.94	Flow Rate (V _{p,ML}), pc/h/ln	1440
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C _{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (E _t)	2.390		
Managed Lane Speed and Density			
Breakpoint (BP _{ML})	501	Indicator Variable	1
Speed 1 (S ₁), mi/h	60.0	Average Speed (S _{ML}), mi/h	44.8
Speed 2 (S ₂), mi/h	3.0	Density (D _{ML}), pc/mi/ln	32.1
Speed 2 (S ₃), mi/h	12.2	Level of Service (LOS)	D

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour
Project Description	BioMarin - US 101 SB Mission Avenue to Second Street		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	4355	Heavy Vehicle Adjustment Factor (f_{HV})	0.919
Peak Hour Factor (PHF)	0.97	Flow Rate ($v_{p,GP}$), pc/h/ln	1628
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.71
Passenger Car Equivalent (E_T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	27.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V _{ML}), veh/h	998	Heavy Vehicle Adjustment Factor (f _{HV})	0.962
Peak Hour Factor	0.94	Flow Rate (V _{p,ML}), pc/h/ln	1104
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c _{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.67
Passenger Car Equivalent (E _t)	3.000		
Managed Lane Speed and Density			
Breakpoint (BP _{ML})	501	Indicator Variable	0
Speed 1 (S ₁), mi/h	60.0	Average Speed (S _{ML}), mi/h	59.0
Speed 2 (S ₂), mi/h	1.0	Density (D _{ML}), pc/mi/ln	18.7
Speed 2 (S ₃), mi/h	5.0	Level of Service (LOS)	C

Leisch Method for Weaving Analysis

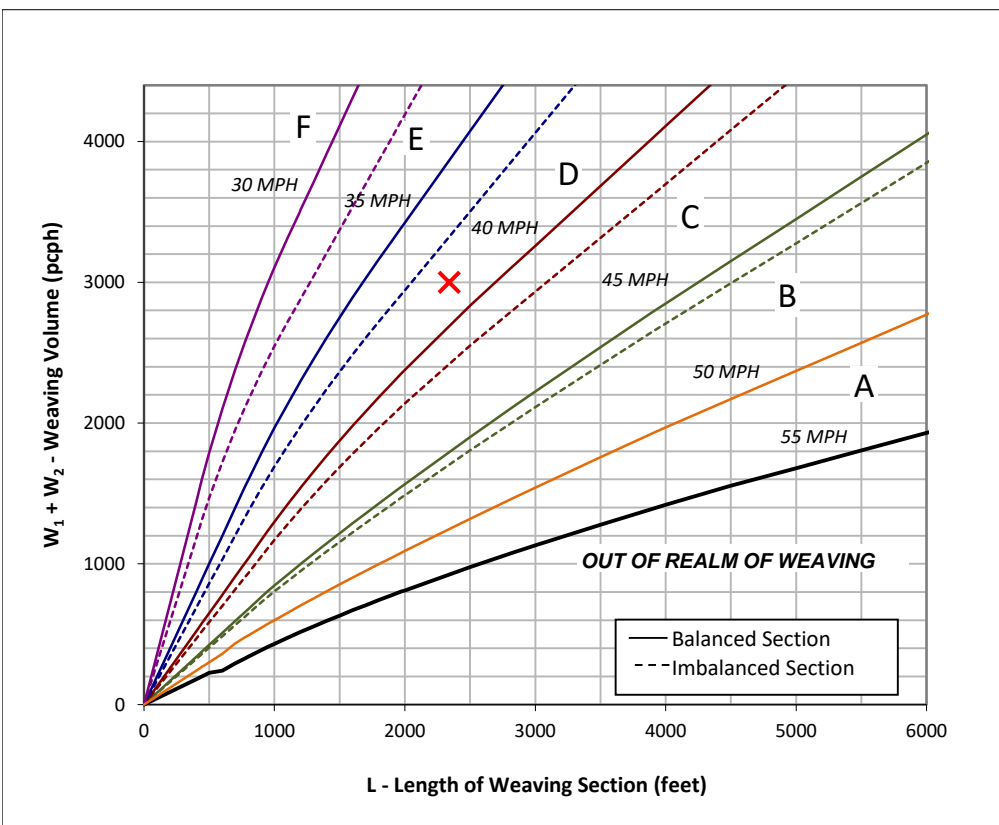
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	2,340

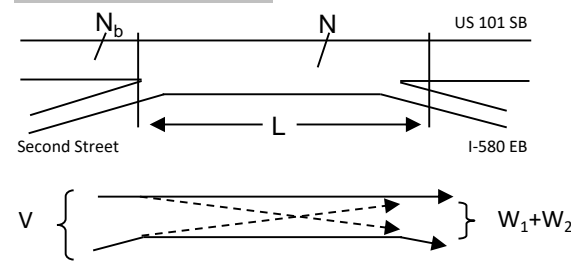
Project Information

Project	BioMarin
Scenario	Baseline AM Peak Hour
Freeway	US 101 SB
On-ramp	Second Street
Off-ramp	I-580 EB

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	6,697	Volume (vph)*	1,709	Volume (vph)*	1,177
Truck Percentage	4%	Truck Percentage	3%	Truck Percentage	2%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	4.1
Volume (pcph)	6,992	Volume (pcph)	1,754	Volume (pcph)	1,247



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)?	Y
<i>If optional exit lane, then "Y". Otherwise "N".</i>	
2. In the chart to the left, which two speed curves is the red "x" between?	35 MPH and 40 MPH
<i>If left of the 30 MPH curve, LOS is F. Select "-".</i>	
<i>If below the 55 MPH curve, out of the realm of weaving.</i>	
3. Interpolated Weaving Speed (S_w , mph)	38.7
4. Weaving Intensity Factor (k)	2.60
5. Service Volume (SV, pcph)	2,248
$SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$	
6. Level of Service (LOS)	F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

Leisch Method for Weaving Analysis

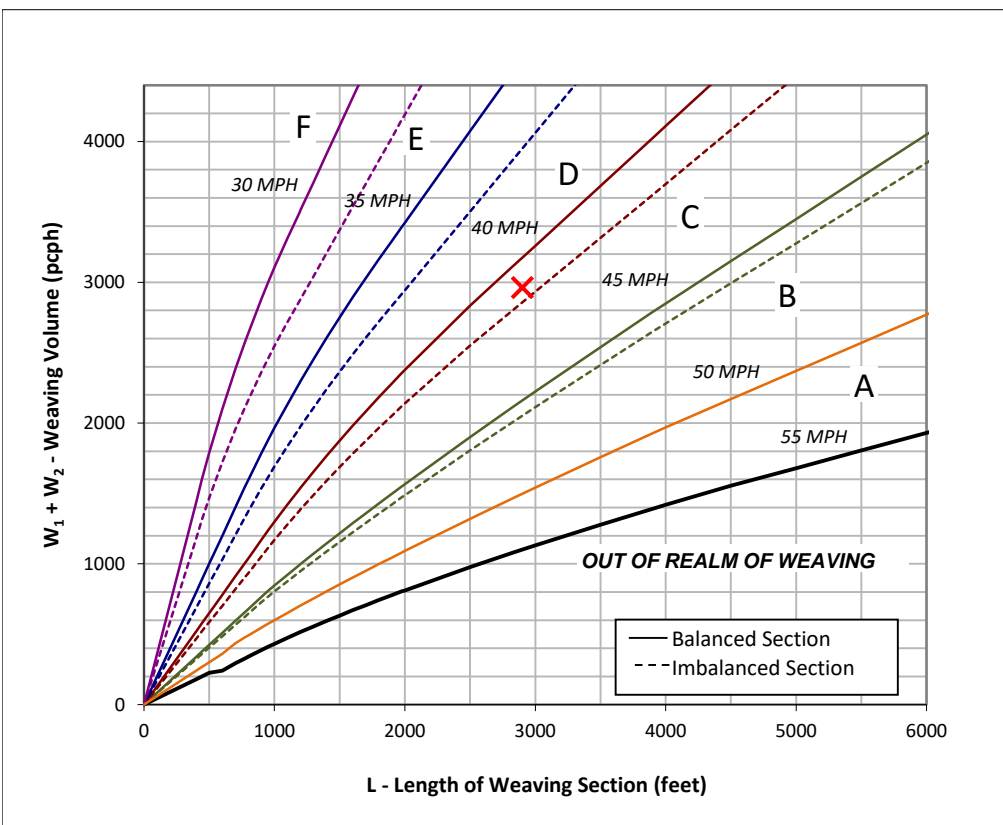
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	5
Length of Weaving Section (feet)	L	2,900

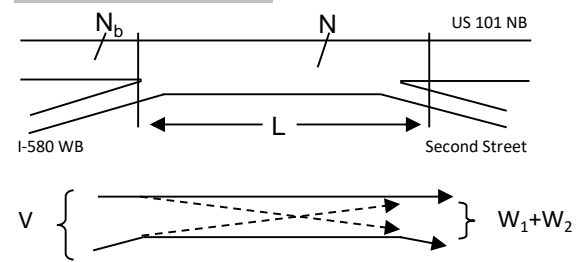
Project Information

Project	BioMarin
Scenario	Baseline PM Peak Hour
Freeway	US 101 NB
On-ramp	I-580 WB
Off-ramp	Second Street

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	6,739	Volume (vph)*	1,546	Volume (vph)*	1,315
Truck Percentage	4%	Truck Percentage	4%	Truck Percentage	3%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	2.0
Volume (pcph)	7,036	Volume (pcph)	1,614	Volume (pcph)	1,350



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)?	N
<i>If optional exit lane, then "Y". Otherwise "N".</i>	
2. In the chart to the left, which two speed curves is the red "x" between?	35 MPH and 40 MPH
<i>If left of the 30 MPH curve, LOS is F. Select "-".</i>	
<i>If below the 55 MPH curve, out of the realm of weaving.</i>	
3. Interpolated Weaving Speed (S_w , mph)	39.5
4. Weaving Intensity Factor (k)	2.55
5. Service Volume (SV, pcph)	1,827
$SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$	
6. Level of Service (LOS)	E

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Baseline Conditions
Project Description	BioMarin - US 101 NB Second Street to Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	4799	Heavy Vehicle Adjustment Factor (f_{HV})	0.919
Peak Hour Factor (PHF)	0.98	Flow Rate ($v_{p,GP}$), pc/h/ln	1776
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.77
Passenger Car Equivalent (E_T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	59.4
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	29.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V _{ML}), veh/h	848	Heavy Vehicle Adjustment Factor (f _{HV})	0.962
Peak Hour Factor	0.99	Flow Rate (V _{p,ML}), pc/h/ln	890
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c _{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.54
Passenger Car Equivalent (E _t)	3.000		
Managed Lane Speed and Density			
Breakpoint (BP _{ML})	501	Indicator Variable	0
Speed 1 (S ₁), mi/h	60.0	Average Speed (S _{ML}), mi/h	59.7
Speed 2 (S ₂), mi/h	0.3	Density (D _{ML}), pc/mi/ln	14.9
Speed 2 (S ₃), mi/h	2.1	Level of Service (LOS)	B

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour
Project Description	BioMarin - US 101 NB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	4	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	2.86
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	1.02
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	6959	Heavy Vehicle Adjustment Factor (f_{HV})	0.889
Peak Hour Factor (PHF)	0.98	Flow Rate ($v_{p,GP}$), pc/h/ln	1997
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (E_T)	3.840		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	57.1
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	35.0
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	2.86

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1217	Heavy Vehicle Adjustment Factor (f_{HV})	0.916
Peak Hour Factor	0.99	Flow Rate ($V_{p,ML}$), pc/h/ln	1342
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.81
Passenger Car Equivalent (E_T)	5.597		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	57.7
Speed 2 (S_2), mi/h	2.3	Density (D_{ML}), pc/mi/ln	23.3
Speed 2 (S_3), mi/h	9.8	Level of Service (LOS)	C

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	4/24/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Baseline Conditions
Project Description	BioMarin - US 101 SB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	-2.44
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	0.77
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	5072	Heavy Vehicle Adjustment Factor (f_{HV})	0.951
Peak Hour Factor (PHF)	0.97	Flow Rate ($v_{p,GP}$), pc/h/ln	1833
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.80
Passenger Car Equivalent (E_T)	2.180		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	59.0
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	31.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1377	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1555
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.94
Passenger Car Equivalent (E_T)	2.390		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	56.0
Speed 2 (S_2), mi/h	4.0	Density (D_{ML}), pc/mi/ln	27.8
Speed 2 (S_3), mi/h	15.4	Level of Service (LOS)	D

HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	4/24/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Baseline Conditions
Project Description	BioMarin - US 101 Mission Ave Slip Off-Ramp		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	3	1
Free-Flow Speed (FFS), mi/h	60.0	50.0
Segment Length (L) / Deceleration Length (L _D), ft	1500	170
Terrain Type	Specific Grade	Specific Grade
Percent Grade, %	-2.44	-1.80
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Volume (V _i), veh/h	5072	1737
Peak Hour Factor (PHF)	0.97	0.96
Total Trucks, %	4.40	2.00
Single-Unit Trucks (SUT), %	66	66
Tractor-Trailers (TT), %	34	34
Heavy Vehicle Adjustment Factor (f _{HV})	0.951	0.973
Flow Rate (v _i), pc/h	5498	1860
Capacity (c), pc/h	6900	2100
Volume-to-Capacity Ratio (v/c)	0.80	0.89

Speed and Density

Upstream Equilibrium Distance (L _{EQ}), ft	101150.1	Density in Ramp Influence Area (D _R), pc/mi/ln	35.5
Distance to Upstream Ramp (L _{UP}), ft	10000	Speed Index (D _S)	0.400
Downstream Equilibrium Distance (L _{EQ}), ft	-	Flow Outer Lanes (v _{OA}), pc/h/ln	1684
Distance to Downstream Ramp (L _{DOWN}), ft	10000	Off-Ramp Influence Area Speed (S _R), mi/h	52.8
Prop. Freeway Vehicles in Lane 1 and 2 (P _{FD})	0.537	Outer Lanes Freeway Speed (S _O), mi/h	63.2
Flow in Lanes 1 and 2 (v ₁₂), pc/h	3814	Ramp Junction Speed (S), mi/h	55.6
Flow Entering Ramp-Infl. Area (v _{R12}), pc/h	-	Average Density (D), pc/mi/ln	33.0
Level of Service (LOS)	E		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44
Managed Lane Adjustment Factors			
Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V _{ML}), veh/h	1380	Heavy Vehicle Adjustment Factor (f _{HV})	0.973
Peak Hour Factor	0.91	Flow Rate (V _{p,ML}), pc/h/ln	1559
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C _{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.94
Passenger Car Equivalent (E _T)	2.390		
Managed Lane Speed and Density			
Breakpoint (BP _{ML})	501	Indicator Variable	0
Speed 1 (S ₁), mi/h	60.0	Average Speed (S _{ML}), mi/h	55.9
Speed 2 (S ₂), mi/h	4.1	Density (D _{ML}), pc/mi/ln	27.9
Speed 2 (S ₃), mi/h	15.5	Level of Service (LOS)	D

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Baseline Conditions
Project Description	BioMarin - US 101 SB Mission Avenue to Second Street		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	3335	Heavy Vehicle Adjustment Factor (f_{HV})	0.919
Peak Hour Factor (PHF)	0.97	Flow Rate ($v_{p,GP}$), pc/h/ln	1247
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.54
Passenger Car Equivalent (E_T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	20.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	918	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1049
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.64
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.2
Speed 2 (S_2), mi/h	0.8	Density (D_{ML}), pc/mi/ln	17.7
Speed 2 (S_3), mi/h	4.2	Level of Service (LOS)	B

Leisch Method for Weaving Analysis

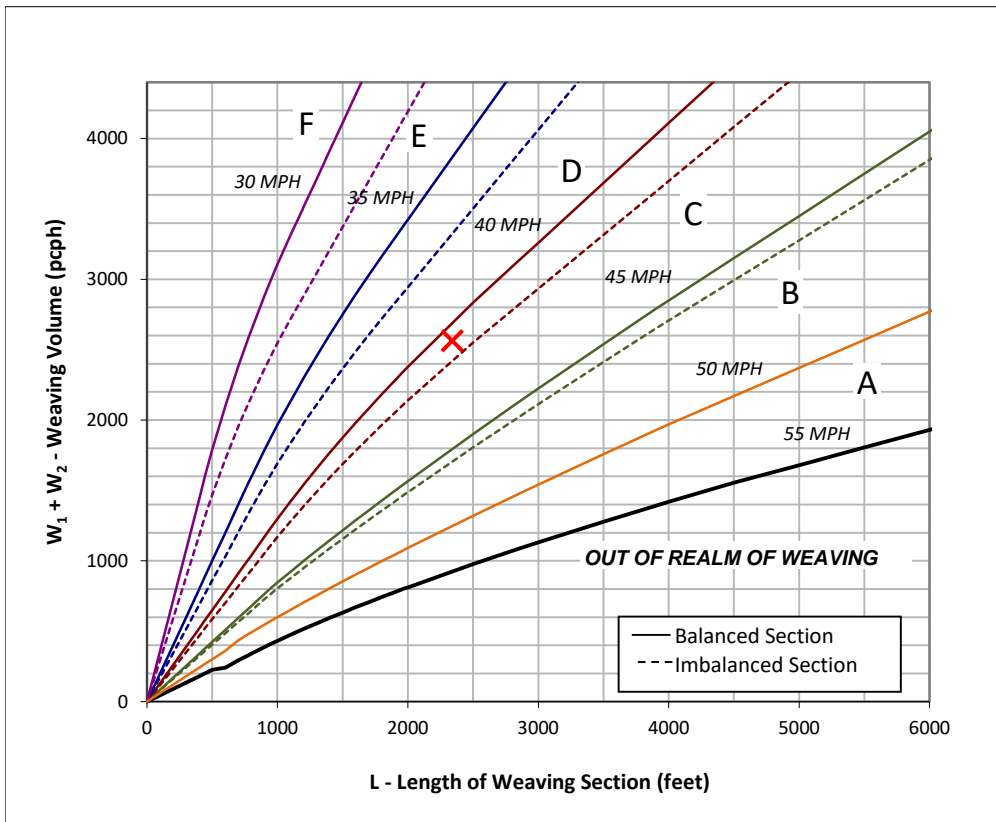
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	2,340

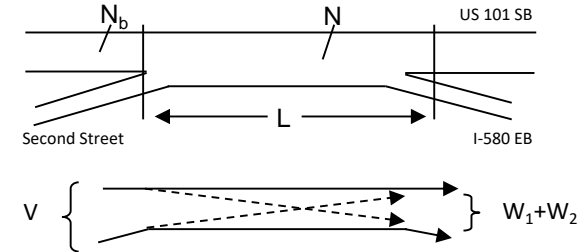
Project Information

Project	BioMarin
Scenario	Baseline PM Peak Hour
Freeway	US 101 SB
On-ramp	Second Street
Off-ramp	I-580 EB

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	5,056	Volume (vph)*	994	Volume (vph)*	1,409
Truck Percentage	4%	Truck Percentage	3%	Truck Percentage	3%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	4.1
Volume (pcph)	5,278	Volume (pcph)	1,019	Volume (pcph)	1,545



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
40 MPH and 45 MPH
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 40.7
- Weaving Intensity Factor (k) 2.47
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,693
- Level of Service (LOS) E

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

Appendix C: Baseline Plus Project Conditions (R&D Only) – Technical Calculations

Transportation Impact Study




















for BioMarin 999 3rd Street

San Rafael Campus Expansion

January 23, 2019

HCM 2010 Signalized Intersection Summary
1: Lincoln & Mission

Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	460	20	70	570	50	20	210	40	60	390	360
Future Volume (veh/h)	110	460	20	70	570	50	20	210	40	60	390	360
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	0.99		0.97	0.99		0.94	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1660	1660	1710	1660	1660	1710	1800	1678	1728	1800	1748	1728
Adj Flow Rate, veh/h	120	500	20	76	620	50	22	228	34	65	424	180
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	2	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	148	865	35	372	625	50	73	509	72	144	848	347
Arrive On Green	0.09	0.55	0.55	0.55	0.55	0.55	0.85	0.85	0.85	0.43	0.43	0.43
Sat Flow, veh/h	1581	1582	63	817	1512	122	49	1192	169	206	1988	813
Grp Volume(v), veh/h	120	0	520	76	0	670	284	0	0	362	0	307
Grp Sat Flow(s),veh/h/ln	1581	0	1646	817	0	1634	1410	0	0	1621	0	1385
Q Serve(g_s), s	5.6	0.0	15.7	4.4	0.0	30.5	0.0	0.0	0.0	2.9	0.0	12.2
Cycle Q Clear(g_c), s	5.6	0.0	15.7	10.1	0.0	30.5	3.5	0.0	0.0	11.6	0.0	12.2
Prop In Lane	1.00		0.04	1.00		0.07	0.08		0.12	0.18		0.59
Lane Grp Cap(c), veh/h	148	0	900	372	0	675	653	0	0	748	0	591
V/C Ratio(X)	0.81	0.00	0.58	0.20	0.00	0.99	0.43	0.00	0.00	0.48	0.00	0.52
Avail Cap(c_a), veh/h	148	0	900	372	0	675	653	0	0	748	0	591
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.72	0.00	0.72	0.87	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.4	0.0	11.3	14.0	0.0	16.8	3.4	0.0	0.0	15.6	0.0	15.8
Incr Delay (d2), s/veh	36.9	0.0	2.7	0.9	0.0	27.5	1.8	0.0	0.0	2.2	0.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.0	7.8	1.1	0.0	18.6	1.5	0.0	0.0	5.9	0.0	5.2
LnGrp Delay(d),s/veh	70.3	0.0	14.0	14.9	0.0	44.2	5.2	0.0	0.0	17.8	0.0	19.1
LnGrp LOS	E		B	B		D	A			B		B
Approach Vol, veh/h		640			746			284			669	
Approach Delay, s/veh		24.5			41.2			5.2			18.4	
Approach LOS		C			D			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		45.2		36.8	10.0	35.2		36.8				
Change Period (Y+Rc), s		* 4.2		4.6	3.0	* 4.2		4.6				
Max Green Setting (Gmax), s		* 41		25.4	7.0	* 31		25.4				
Max Q Clear Time (g_c+I1), s		17.7		5.5	7.6	32.5		14.2				
Green Ext Time (p_c), s		5.1		2.4	0.0	0.0		4.5				
Intersection Summary												
HCM 2010 Ctrl Delay			25.8									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis

2: Hetherton & Mission

Baseline Plus BioMarin Only Conditions

Timing Plan: AM Peak Hour



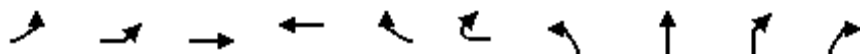
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↑↑			↑						↑↑	↑		
Traffic Volume (vph)	0	490	80	40	220	0	0	0	0	220	1026	465		
Future Volume (vph)	0	490	80	40	220	0	0	0	0	220	1026	465		
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800		
Lane Width	12	10	12	12	16	12	12	12	12	12	12	12		
Total Lost time (s)		4.2			4.2						4.6	4.6		
Lane Util. Factor		0.95			1.00						0.95	1.00		
Frbp, ped/bikes		0.99			1.00						1.00	0.97		
Flpb, ped/bikes		1.00			1.00						1.00	1.00		
Frt		0.98			1.00						1.00	0.85		
Flt Protected		1.00			0.99						0.99	1.00		
Satd. Flow (prot)		2715			1766						2962	1302		
Flt Permitted		1.00			0.86						0.99	1.00		
Satd. Flow (perm)		2715			1534						2962	1302		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	0	533	87	43	239	0	0	0	0	239	1115	505		
RTOR Reduction (vph)	0	17	0	0	0	0	0	0	0	0	0	0		
Lane Group Flow (vph)	0	603	0	0	282	0	0	0	0	0	1354	505		
Confl. Peds. (#/hr)	15		22	22		15			16			1		
Confl. Bikes (#/hr)			3			2			1			3		
Turn Type		NA		Perm	NA					Split	NA	custom		
Protected Phases		4			8					2	2			
Permitted Phases				8								5		
Actuated Green, G (s)		32.8			32.8						33.4	26.4		
Effective Green, g (s)		32.8			32.8						33.4	26.4		
Actuated g/C Ratio		0.44			0.44						0.45	0.35		
Clearance Time (s)		4.2			4.2						4.6	4.6		
Vehicle Extension (s)		3.0			3.0						3.0	3.0		
Lane Grp Cap (vph)		1187			670						1319	458		
v/s Ratio Prot		c0.22									c0.46			
v/s Ratio Perm					0.18							0.39		
v/c Ratio		0.51			0.42						1.03	1.10		
Uniform Delay, d1		15.3			14.6						20.8	24.3		
Progression Factor		0.61			1.45						1.00	1.00		
Incremental Delay, d2		1.3			1.6						31.8	72.9		
Delay (s)		10.5			22.6						52.6	97.2		
Level of Service		B			C						D	F		
Approach Delay (s)		10.5			22.6			0.0			64.7			
Approach LOS		B			C			A			E			
Intersection Summary														
HCM 2000 Control Delay			48.2									HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio			0.79											
Actuated Cycle Length (s)			75.0								10.8		Sum of lost time (s)	
Intersection Capacity Utilization			92.4%										ICU Level of Service	F
Analysis Period (min)			15											
c Critical Lane Group														

HCM Signalized Intersection Capacity Analysis

3: Irwin & Mission

Baseline Plus BioMarin Only Conditions



















Timing Plan: AM Peak Hour



Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2	
Lane Configurations											
Traffic Volume (vph)	380	20	310	160	320	5	110	1071	130	40	
Future Volume (vph)	380	20	310	160	320	5	110	1071	130	40	
Ideal Flow (vphpl)	2200	1800	2200	2200	2200	1800	2200	2200	1800	2200	
Lane Width	9	12	10	10	9	12	12	12	12	12	
Total Lost time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Lane Util. Factor		1.00	1.00	1.00	1.00			0.95	1.00		
Frbp, ped/bikes		1.00	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		
Frt		1.00	1.00	1.00	0.85			1.00	0.85		
Flt Protected		0.95	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (prot)		1494	1794	1615	1471			3428	1295		
Flt Permitted		0.60	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (perm)		938	1794	1615	1471			3428	1295		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	413	22	337	174	348	5	120	1164	141	43	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	44	0	
Lane Group Flow (vph)	0	435	337	174	353	0	0	1284	140	0	
Confl. Peds. (#/hr)							13			6	
Confl. Bikes (#/hr)					2	2				2	
Parking (#/hr)				0				2			
Turn Type	pm+pt	pm+pt	NA	NA	Prot		Perm	NA	Perm		
Protected Phases	5	5	2	6	6			4			
Permitted Phases	2	2					4			4	
Actuated Green, G (s)		33.8	33.8	18.8	18.8			32.8	32.8		
Effective Green, g (s)		33.8	33.8	18.8	18.8			32.8	32.8		
Actuated g/C Ratio		0.45	0.45	0.25	0.25			0.44	0.44		
Clearance Time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Lane Grp Cap (vph)		502	808	404	368			1499	566		
v/s Ratio Prot		c0.12	0.19	0.11	c0.24						
v/s Ratio Perm		0.27						0.37	0.11		
v/c Ratio		0.87	0.42	0.43	0.96			0.86	0.25		
Uniform Delay, d1		19.1	13.9	23.6	27.7			19.0	13.3		
Progression Factor		0.99	0.95	1.00	1.00			0.74	0.66		
Incremental Delay, d2		13.8	1.2	3.3	37.7			3.1	0.5		
Delay (s)		32.8	14.3	26.9	65.4			17.2	9.3		
Level of Service		C	B	C	E			B	A		
Approach Delay (s)			24.8	52.7				16.2			
Approach LOS			C	D				B			
Intersection Summary											
HCM 2000 Control Delay			25.5							HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.91								
Actuated Cycle Length (s)			75.0							Sum of lost time (s)	12.6
Intersection Capacity Utilization			89.5%							ICU Level of Service	E
Analysis Period (min)			15								
c	Critical Lane Group										

HCM 2010 Signalized Intersection Summary
4: Lincoln & 5th

Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	300	40	70	280	30	10	220	45	40	400	40
Future Volume (veh/h)	30	300	40	70	280	30	10	220	45	40	400	40
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	0.99		0.94	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1398	1545	1530	1398	1485	1530	1440	1485	1469	1440	1485	1469
Adj Flow Rate, veh/h	33	326	36	76	304	28	11	239	39	43	435	39
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	243	534	59	257	524	48	58	523	83	82	534	46
Arrive On Green	0.39	0.39	0.39	0.13	0.13	0.13	0.97	0.97	0.97	0.97	0.97	0.97
Sat Flow, veh/h	825	1361	150	802	1336	123	16	1077	171	62	1101	95
Grp Volume(v), veh/h	33	0	362	76	0	332	289	0	0	517	0	0
Grp Sat Flow(s),veh/h/ln	825	0	1511	802	0	1459	1264	0	0	1258	0	0
Q Serve(g_s), s	2.6	0.0	14.4	6.9	0.0	16.1	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	18.6	0.0	14.4	21.2	0.0	16.1	0.9	0.0	0.0	4.3	0.0	0.0
Prop In Lane	1.00		0.10	1.00		0.08	0.04		0.13	0.08		0.08
Lane Grp Cap(c), veh/h	243	0	592	257	0	572	663	0	0	662	0	0
V/C Ratio(X)	0.14	0.00	0.61	0.30	0.00	0.58	0.44	0.00	0.00	0.78	0.00	0.00
Avail Cap(c_a), veh/h	243	0	592	257	0	572	663	0	0	662	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.94	0.00	0.94	0.85	0.00	0.00	0.51	0.00	0.00
Uniform Delay (d), s/veh	26.4	0.0	18.2	36.0	0.0	26.8	0.6	0.0	0.0	0.6	0.0	0.0
Incr Delay (d2), s/veh	1.2	0.0	4.6	2.8	0.0	4.0	1.8	0.0	0.0	4.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	6.7	1.7	0.0	7.1	0.6	0.0	0.0	1.3	0.0	0.0
LnGrp Delay(d),s/veh	27.6	0.0	22.9	38.8	0.0	30.9	2.3	0.0	0.0	5.3	0.0	0.0
LnGrp LOS	C		C	D		C	A			A		
Approach Vol, veh/h		395			408			289			517	
Approach Delay, s/veh		23.3			32.3			2.3			5.3	
Approach LOS		C			C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		34.0		41.0		34.0		41.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		29.4		36.4		29.4		36.4				
Max Q Clear Time (g_c+I1), s		20.6		2.9		23.2		6.3				
Green Ext Time (p_c), s		1.2		1.3		1.0		2.6				
Intersection Summary												
HCM 2010 Ctrl Delay			16.0									
HCM 2010 LOS			B									

HCM Signalized Intersection Capacity Analysis

5: Hetherton & 5th

Baseline Plus BioMarin Only Conditions

Timing Plan: AM Peak Hour




















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↕↕↕	↕
Traffic Volume (vph)	0	240	165	40	245	0	0	0	0	50	981	115
Future Volume (vph)	0	240	165	40	245	0	0	0	0	50	981	115
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		1.00			1.00						0.91	1.00
Frbp, ped/bikes		0.99			1.00						1.00	0.95
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.95			1.00						1.00	0.85
Flt Protected		1.00			0.99						1.00	1.00
Satd. Flow (prot)		1665			1769						4118	1127
Flt Permitted		1.00			0.91						1.00	1.00
Satd. Flow (perm)		1665			1612						4118	1127
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	261	179	43	266	0	0	0	0	54	1066	125
RTOR Reduction (vph)	0	23	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	417	0	0	309	0	0	0	0	0	1120	125
Confl. Peds. (#/hr)			15	15		14			22	22		10
Confl. Bikes (#/hr)			4			2			2			2
Parking (#/hr)											2	2
Turn Type		NA		Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases				8						2		5
Actuated Green, G (s)		32.8			32.8						33.4	26.4
Effective Green, g (s)		32.8			32.8						33.4	26.4
Actuated g/C Ratio		0.44			0.44						0.45	0.35
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		728			704						1833	396
v/s Ratio Prot		c0.25										
v/s Ratio Perm					0.19						0.27	0.11
v/c Ratio		0.57			0.44						0.61	0.32
Uniform Delay, d1		15.8			14.7						15.8	17.7
Progression Factor		0.44			1.25						0.17	0.25
Incremental Delay, d2		3.1			1.2						0.4	0.6
Delay (s)		10.1			19.5						3.1	5.0
Level of Service		B			B						A	A
Approach Delay (s)		10.1			19.5			0.0			3.3	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.3									A
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			75.0							10.8		
Intersection Capacity Utilization			82.9%									E
Analysis Period (min)			15									

c Critical Lane Group



















HCM 2010 Signalized Intersection Summary
6: Irwin & 5th

Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	100	0	0	155	120	155	1121	10	0	0	0
Future Volume (veh/h)	140	100	0	0	155	120	155	1121	10	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.89	0.89	1.00	0.89			
Adj Sat Flow, veh/h/ln	1573	1573	0	0	1573	1620	1620	1573	1620			
Adj Flow Rate, veh/h	152	109	0	0	168	90	168	1218	10			
Adj No. of Lanes	1	1	0	0	1	0	0	2	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	0	3	0			
Cap, veh/h	237	491	0	0	265	142	180	1379	12			
Arrive On Green	0.10	0.10	0.00	0.00	0.31	0.31	0.19	0.19	0.19			
Sat Flow, veh/h	993	1573	0	0	849	455	319	2440	21			
Grp Volume(v), veh/h	152	109	0	0	0	258	728	0	668			
Grp Sat Flow(s),veh/h/ln	993	1573	0	0	0	1304	1384	0	1396			
Q Serve(g_s), s	10.7	4.8	0.0	0.0	0.0	12.7	38.9	0.0	34.6			
Cycle Q Clear(g_c), s	23.4	4.8	0.0	0.0	0.0	12.7	38.9	0.0	34.6			
Prop In Lane	1.00		0.00	0.00		0.35	0.23		0.01			
Lane Grp Cap(c), veh/h	237	491	0	0	0	407	782	0	789			
V/C Ratio(X)	0.64	0.22	0.00	0.00	0.00	0.63	0.93	0.00	0.85			
Avail Cap(c_a), veh/h	237	491	0	0	0	407	782	0	789			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	40.4	25.3	0.0	0.0	0.0	22.1	29.1	0.0	27.3			
Incr Delay (d2), s/veh	12.5	1.0	0.0	0.0	0.0	7.3	19.2	0.0	10.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.0	2.2	0.0	0.0	0.0	5.4	19.1	0.0	15.8			
LnGrp Delay(d),s/veh	52.9	26.3	0.0	0.0	0.0	29.5	48.3	0.0	38.2			
LnGrp LOS	D	C				C	D		D			
Approach Vol, veh/h		261			258			1396				
Approach Delay, s/veh		41.8			29.5			43.4				
Approach LOS		D			C			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		28.0		47.0		28.0						
Change Period (Y+Rc), s		4.6		4.6		4.6						
Max Green Setting (Gmax), s		23.4		42.4		23.4						
Max Q Clear Time (g_c+I1), s		25.4		40.9		14.7						
Green Ext Time (p_c), s		0.0		1.1		0.7						
Intersection Summary												
HCM 2010 Ctrl Delay				41.3								
HCM 2010 LOS				D								

HCM 2010 Signalized Intersection Summary
7: Lincoln & 4th

Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

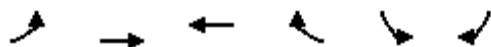
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	260	20	70	310	30	20	225	65	65	370	80
Future Volume (veh/h)	30	260	20	70	310	30	20	225	65	65	370	80
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.92	0.98		0.92	0.97		0.91	0.99		0.91
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1573	1510	1620	1573	1573	1620	1620	1573	1555	1620	1573	1555
Adj Flow Rate, veh/h	33	283	18	76	337	28	22	245	57	71	402	77
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	238	536	34	309	546	45	71	517	115	113	496	90
Arrive On Green	0.38	0.38	0.38	0.13	0.13	0.13	0.17	0.17	0.17	1.00	1.00	1.00
Sat Flow, veh/h	894	1396	89	937	1422	118	40	1027	228	116	983	179
Grp Volume(v), veh/h	33	0	301	76	0	365	324	0	0	550	0	0
Grp Sat Flow(s),veh/h/ln	894	0	1485	937	0	1540	1294	0	0	1279	0	0
Q Serve(g_s), s	2.4	0.0	11.7	5.8	0.0	16.8	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	19.3	0.0	11.7	17.5	0.0	16.8	16.5	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.08	0.07		0.18	0.13		0.14
Lane Grp Cap(c), veh/h	238	0	570	309	0	591	703	0	0	699	0	0
V/C Ratio(X)	0.14	0.00	0.53	0.25	0.00	0.62	0.46	0.00	0.00	0.79	0.00	0.00
Avail Cap(c_a), veh/h	238	0	570	309	0	591	703	0	0	699	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.92	0.00	0.92	0.46	0.00	0.00	0.46	0.00	0.00
Uniform Delay (d), s/veh	27.5	0.0	17.8	33.4	0.0	27.5	22.4	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	1.2	0.0	3.5	1.7	0.0	4.4	1.0	0.0	0.0	4.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	5.3	1.6	0.0	7.9	6.3	0.0	0.0	0.8	0.0	0.0
LnGrp Delay(d),s/veh	28.7	0.0	21.3	35.2	0.0	31.9	23.4	0.0	0.0	4.2	0.0	0.0
LnGrp LOS	C		C	D		C	C			A		
Approach Vol, veh/h		334			441			324			550	
Approach Delay, s/veh		22.1			32.5			23.4			4.2	
Approach LOS		C			C			C			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		33.0		42.0		33.0		42.0				
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2		* 4.2				
Max Green Setting (Gmax), s		* 29		* 38		* 29		* 38				
Max Q Clear Time (g_c+I1), s		21.3		18.5		19.5		2.0				
Green Ext Time (p_c), s		1.6		2.8		2.6		6.7				
Intersection Summary												
HCM 2010 Ctrl Delay			19.1									
HCM 2010 LOS			B									
Notes												

HCM Signalized Intersection Capacity Analysis

8: 4th & Tamalpais

Baseline Plus BioMarin Only Conditions

Timing Plan: AM Peak Hour

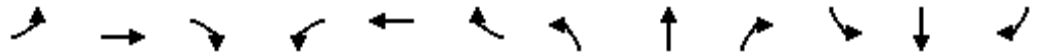


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↔			↗
Traffic Volume (vph)	0	410	380	35	0	35
Future Volume (vph)	0	410	380	35	0	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.6	5.6			5.2
Lane Util. Factor		1.00	1.00			1.00
Frbp, ped/bikes		1.00	0.99			0.87
Flpb, ped/bikes		1.00	1.00			1.00
Frt		1.00	0.99			0.86
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		1573	1540			1188
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		1573	1540			1188
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	446	413	38	0	38
RTOR Reduction (vph)	0	0	4	0	0	32
Lane Group Flow (vph)	0	446	447	0	0	6
Confl. Peds. (#/hr)				39		46
Confl. Bikes (#/hr)				4		
Turn Type		NA	NA			Perm
Protected Phases		2 8	4 6			
Permitted Phases						8
Actuated Green, G (s)		50.7	51.8			12.4
Effective Green, g (s)		50.7	51.8			12.4
Actuated g/C Ratio		0.68	0.69			0.17
Clearance Time (s)						5.2
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)		1063	1063			196
v/s Ratio Prot		c0.28	c0.29			
v/s Ratio Perm						0.01
v/c Ratio		0.42	0.42			0.03
Uniform Delay, d1		5.5	5.1			26.3
Progression Factor		1.63	0.49			1.00
Incremental Delay, d2		0.2	0.2			0.1
Delay (s)		9.2	2.6			26.3
Level of Service		A	A			C
Approach Delay (s)		9.2	2.6		26.3	
Approach LOS		A	A		C	
Intersection Summary						
HCM 2000 Control Delay			6.7		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.48			
Actuated Cycle Length (s)			75.0		Sum of lost time (s)	16.4
Intersection Capacity Utilization			46.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
9: Hetherton & 4th

Baseline Plus BioMarin Only Conditions



















Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↖	↑						↑↑↑	↗
Traffic Volume (vph)	0	285	130	185	285	0	0	0	0	105	881	200
Future Volume (vph)	0	285	130	185	285	0	0	0	0	105	881	200
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	13	10	15	11	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Lane Util. Factor		1.00	1.00	1.00	1.00						0.91	1.00
Frbp, ped/bikes		1.00	0.95	1.00	1.00						1.00	0.89
Flpb, ped/bikes		1.00	1.00	0.98	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						0.99	1.00
Satd. Flow (prot)		1625	1180	1606	1520						4263	1185
Flt Permitted		1.00	1.00	0.49	1.00						0.99	1.00
Satd. Flow (perm)		1625	1180	832	1520						4263	1185
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	310	141	201	310	0	0	0	0	114	958	217
RTOR Reduction (vph)	0	0	29	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	310	112	201	310	0	0	0	0	0	1072	217
Confl. Peds. (#/hr)			40	40		22			9	9		30
Confl. Bikes (#/hr)			8			4						2
Turn Type		NA	Perm	Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases			4	8						2		5
Actuated Green, G (s)		32.8	32.8	32.8	32.8						33.4	26.4
Effective Green, g (s)		32.8	32.8	32.8	32.8						33.4	26.4
Actuated g/C Ratio		0.44	0.44	0.44	0.44						0.45	0.35
Clearance Time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		710	516	363	664						1898	417
v/s Ratio Prot		0.19			0.20							
v/s Ratio Perm			0.09	0.24							0.25	0.18
v/c Ratio		0.44	0.22	0.55	0.47						0.56	0.52
Uniform Delay, d1		14.7	13.1	15.7	14.9						15.4	19.3
Progression Factor		0.39	0.26	1.02	1.03						0.33	0.43
Incremental Delay, d2		1.8	0.9	4.4	1.7						1.0	3.7
Delay (s)		7.6	4.3	20.3	17.2						6.1	11.9
Level of Service		A	A	C	B						A	B
Approach Delay (s)		6.5			18.4			0.0			7.1	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.6			HCM 2000 Level of Service					A	
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			75.0			Sum of lost time (s)				10.8		
Intersection Capacity Utilization			84.5%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												















HCM 2010 Signalized Intersection Summary
10: Irwin & 4th

Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	230	0	0	345	70	130	1086	50	0	0	0
Future Volume (veh/h)	160	230	0	0	345	70	130	1086	50	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.95	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89			
Adj Sat Flow, veh/h/ln	1573	1573	0	0	1573	1620	1510	1573	1620			
Adj Flow Rate, veh/h	174	250	0	0	375	65	141	1180	50			
Adj No. of Lanes	1	1	0	0	1	0	1	2	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	152	604	0	0	443	77	725	1389	59			
Arrive On Green	0.77	0.77	0.00	0.00	0.13	0.13	0.17	0.17	0.17			
Sat Flow, veh/h	842	1573	0	0	1153	200	1438	2756	117			
Grp Volume(v), veh/h	174	250	0	0	0	440	141	639	591			
Grp Sat Flow(s),veh/h/ln	842	1573	0	0	0	1353	1438	1494	1378			
Q Serve(g_s), s	4.9	4.1	0.0	0.0	0.0	23.9	6.3	31.2	31.2			
Cycle Q Clear(g_c), s	28.8	4.1	0.0	0.0	0.0	23.9	6.3	31.2	31.2			
Prop In Lane	1.00		0.00	0.00		0.15	1.00		0.08			
Lane Grp Cap(c), veh/h	152	604	0	0	0	520	725	753	695			
V/C Ratio(X)	1.15	0.41	0.00	0.00	0.00	0.85	0.19	0.85	0.85			
Avail Cap(c_a), veh/h	152	604	0	0	0	520	725	753	695			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33			
Upstream Filter(I)	0.90	0.90	0.00	0.00	0.00	1.00	0.30	0.30	0.30			
Uniform Delay (d), s/veh	22.2	5.8	0.0	0.0	0.0	30.6	18.1	28.5	28.5			
Incr Delay (d2), s/veh	114.7	1.9	0.0	0.0	0.0	15.6	0.2	3.9	4.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	7.9	1.9	0.0	0.0	0.0	11.2	2.6	13.7	12.7			
LnGrp Delay(d),s/veh	136.9	7.7	0.0	0.0	0.0	46.2	18.3	32.3	32.7			
LnGrp LOS	F	A				D	B	C	C			
Approach Vol, veh/h		424			440			1371				
Approach Delay, s/veh		60.7			46.2			31.1				
Approach LOS		E			D			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		33.0		42.0		33.0						
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2						
Max Green Setting (Gmax), s		* 29		* 38		* 29						
Max Q Clear Time (g_c+I1), s		30.8		33.2		25.9						
Green Ext Time (p_c), s		0.0		2.7		0.6						
Intersection Summary												
HCM 2010 Ctrl Delay				39.7								
HCM 2010 LOS				D								
Notes												













HCM 2010 Signalized Intersection Summary
11: D & 3rd

Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	295	1136	0	0	0	0	0	230	30
Future Volume (veh/h)	0	0	0	295	1136	0	0	0	0	0	230	30
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1530	1485	0				0	1485	1530
Adj Flow Rate, veh/h				321	1235	0				0	250	18
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				502	1719	0				0	786	56
Arrive On Green				0.19	0.19	0.00				0.00	0.31	0.31
Sat Flow, veh/h				747	3133	0				0	2593	180
Grp Volume(v), veh/h				558	998	0				0	139	129
Grp Sat Flow(s),veh/h/ln				1299	1230	0				0	1411	1288
Q Serve(g_s), s				30.5	28.5	0.0				0.0	5.6	5.7
Cycle Q Clear(g_c), s				30.5	28.5	0.0				0.0	5.6	5.7
Prop In Lane				0.58		0.00				0.00		0.14
Lane Grp Cap(c), veh/h				817	1404	0				0	440	402
V/C Ratio(X)				0.68	0.71	0.00				0.00	0.32	0.32
Avail Cap(c_a), veh/h				817	1404	0				0	440	402
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				25.4	24.6	0.0				0.0	19.7	19.7
Incr Delay (d2), s/veh				4.6	3.1	0.0				0.0	1.9	2.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				12.0	10.3	0.0				0.0	2.4	2.3
LnGrp Delay(d),s/veh				30.0	27.7	0.0				0.0	21.6	21.8
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1556						268	
Approach Delay, s/veh					28.6						21.7	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		47.0		28.0								
Change Period (Y+Rc), s		* 4.2		4.6								
Max Green Setting (Gmax), s		* 43		23.4								
Max Q Clear Time (g_c+I1), s		32.5		7.7								
Green Ext Time (p_c), s		5.7		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay				27.5								
HCM 2010 LOS				C								
Notes												


















HCM 2010 Signalized Intersection Summary
12: C & 3rd

Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑		↑↑				
Traffic Volume (veh/h)	0	0	0	0	1316	110	100	235	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1316	110	100	235	0	0	0	0
Number				5	2	12	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.98	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1398	1398	1440	1398	0			
Adj Flow Rate, veh/h				0	1430	82	109	255	0			
Adj No. of Lanes				0	3	1	0	2	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	3	3	3	3	0			
Cap, veh/h				0	2229	679	266	553	0			
Arrive On Green				0.00	0.19	0.19	0.10	0.10	0.00			
Sat Flow, veh/h				0	3943	1163	630	1883	0			
Grp Volume(v), veh/h				0	1430	82	197	167	0			
Grp Sat Flow(s),veh/h/ln				0	1272	1163	1241	1209	0			
Q Serve(g_s), s				0.0	25.9	4.4	9.6	9.7	0.0			
Cycle Q Clear(g_c), s				0.0	25.9	4.4	11.2	9.7	0.0			
Prop In Lane				0.00		1.00	0.55		0.00			
Lane Grp Cap(c), veh/h				0	2229	679	452	367	0			
V/C Ratio(X)				0.00	0.64	0.12	0.44	0.45	0.00			
Avail Cap(c_a), veh/h				0	2229	679	452	367	0			
HCM Platoon Ratio				1.00	0.33	0.33	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	23.0	14.4	28.4	27.9	0.0			
Incr Delay (d2), s/veh				0.0	1.4	0.4	3.1	4.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	9.4	1.5	4.3	3.7	0.0			
LnGrp Delay(d),s/veh				0.0	24.5	14.7	31.5	31.9	0.0			
LnGrp LOS					C	B	C	C				
Approach Vol, veh/h					1512			364				
Approach Delay, s/veh					23.9			31.7				
Approach LOS					C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		48.0		27.0								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 44		* 23								
Max Q Clear Time (g_c+I1), s		27.9		13.2								
Green Ext Time (p_c), s		7.6		1.0								
Intersection Summary												
HCM 2010 Ctrl Delay				25.4								
HCM 2010 LOS				C								
Notes												

















HCM 2010 Signalized Intersection Summary
13: B & 3rd

Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  						 	
Traffic Volume (veh/h)	0	0	0	90	1371	0	0	0	0	0	190	50
Future Volume (veh/h)	0	0	0	90	1371	0	0	0	0	0	190	50
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.87
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1440	1398	0				0	1398	1440
Adj Flow Rate, veh/h				98	1490	0				0	207	25
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				167	2129	0				0	616	72
Arrive On Green				0.20	0.20	0.00				0.00	0.28	0.28
Sat Flow, veh/h				182	3601	0				0	2290	261
Grp Volume(v), veh/h				590	998	0				0	122	110
Grp Sat Flow(s),veh/h/ln				1353	1158	0				0	1328	1153
Q Serve(g_s), s				21.8	30.1	0.0				0.0	5.5	5.7
Cycle Q Clear(g_c), s				30.4	30.1	0.0				0.0	5.5	5.7
Prop In Lane				0.17		0.00				0.00		0.23
Lane Grp Cap(c), veh/h				882	1414	0				0	368	320
V/C Ratio(X)				0.67	0.71	0.00				0.00	0.33	0.34
Avail Cap(c_a), veh/h				882	1414	0				0	368	320
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				23.7	23.7	0.0				0.0	21.6	21.7
Incr Delay (d2), s/veh				4.0	3.0	0.0				0.0	2.4	2.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				12.4	10.3	0.0				0.0	2.2	2.1
LnGrp Delay(d),s/veh				27.7	26.7	0.0				0.0	24.0	24.6
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1588						232	
Approach Delay, s/veh					27.0						24.3	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		50.0		25.0								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 46		* 21								
Max Q Clear Time (g_c+I1), s		32.4		7.7								
Green Ext Time (p_c), s		6.8		0.7								
Intersection Summary												
HCM 2010 Ctrl Delay				26.7								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary
14: A & 3rd

Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	40	1226	80	195	120	0	0	130	30
Future Volume (veh/h)	0	0	0	40	1226	80	195	120	0	0	130	30
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	0.97		1.00	1.00		0.93
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1800	1748	1800	1835	1835	0	0	1835	1890
Adj Flow Rate, veh/h				43	1333	77	212	130	0	0	141	21
Adj No. of Lanes				0	3	0	1	1	0	0	1	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	3	0	3	3	0	0	3	3
Cap, veh/h				72	2357	141	371	685	0	0	358	53
Arrive On Green				0.17	0.17	0.17	0.02	0.12	0.00	0.00	0.26	0.26
Sat Flow, veh/h				139	4591	274	1748	1835	0	0	1375	205
Grp Volume(v), veh/h				537	446	470	212	130	0	0	0	162
Grp Sat Flow(s),veh/h/ln				1741	1590	1674	1748	1835	0	0	0	1580
Q Serve(g_s), s				21.4	19.3	19.3	0.0	4.8	0.0	0.0	0.0	6.3
Cycle Q Clear(g_c), s				21.4	19.3	19.3	0.0	4.8	0.0	0.0	0.0	6.3
Prop In Lane				0.08		0.16	1.00		0.00	0.00		0.13
Lane Grp Cap(c), veh/h				894	816	859	371	685	0	0	0	411
V/C Ratio(X)				0.60	0.55	0.55	0.57	0.19	0.00	0.00	0.00	0.39
Avail Cap(c_a), veh/h				894	816	859	371	685	0	0	0	411
HCM Platoon Ratio				0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				24.0	23.2	23.2	30.1	22.7	0.0	0.0	0.0	22.9
Incr Delay (d2), s/veh				3.0	2.6	2.5	6.2	0.6	0.0	0.0	0.0	2.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.0	9.1	9.5	5.0	2.5	0.0	0.0	0.0	3.1
LnGrp Delay(d),s/veh				27.0	25.8	25.7	36.3	23.3	0.0	0.0	0.0	25.7
LnGrp LOS				C	C	C	D	C				C
Approach Vol, veh/h					1453			342			162	
Approach Delay, s/veh					26.2			31.4			25.7	
Approach LOS					C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			8.0	24.0		43.0		32.0				
Change Period (Y+Rc), s			4.0	4.5		4.5		4.0				
Max Green Setting (Gmax), s			4.0	19.5		38.5		28.0				
Max Q Clear Time (g_c+I1), s			2.0	8.3		23.4		6.8				
Green Ext Time (p_c), s			0.3	0.8		10.6		0.9				
Intersection Summary												
HCM 2010 Ctrl Delay				27.1								
HCM 2010 LOS				C								

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

BioMarin
Baseline + BioMarin Only Conditions
AM Peak Hour

Intersection 15 Brooks St/3rd St Side-street Stop
















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	20	19	95.7%	10.5	4.3	B
	Through	5	6	125.1%	24.4	17.8	C
	Right Turn						
	Subtotal	25	25	101.6%	14.5	5.5	B
SB	Left Turn						
	Through	5	3	51.5%	6.7	12.7	A
	Right Turn	5	7	139.8%	15.4	12.5	C
	Subtotal	10	10	95.7%	17.0	11.6	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	30	27	89.5%	2.5	0.3	A
	Through	1,321	1,301	98.5%	2.4	0.4	A
	Right Turn	5	5	103.0%	1.8	1.1	A
	Subtotal	1,356	1,333	98.3%	2.4	0.4	A
Total		1,391	1,368	98.3%	2.7	0.4	A

Intersection 16 Lindero St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	83	78	93.6%	15.5	2.7	B
	Through	10	9	92.0%	14.5	11.7	B
	Right Turn						
	Subtotal	93	87	93.4%	15.8	2.7	B
SB	Left Turn						
	Through	40	37	92.9%	36.0	9.2	D
	Right Turn	10	8	81.0%	18.6	9.2	B
	Subtotal	50	45	90.5%	32.5	8.8	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	452	433	95.8%	25.5	12.6	C
	Through	1,293	1,275	98.6%	8.4	2.8	A
	Right Turn	30	32	105.5%	6.5	2.6	A
	Subtotal	1,775	1,740	98.0%	12.7	5.1	B
Total		1,918	1,872	97.6%	13.3	4.8	B



















HCM 2010 Signalized Intersection Summary
17: Lincoln & 3rd

Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	160	1659	55	31	195	0	0	280	165
Future Volume (veh/h)	0	0	0	160	1659	55	31	195	0	0	280	165
Number				1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.92	1.00		1.00	1.00		0.91
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Adj Sat Flow, veh/h/ln				1620	1573	1620	1620	1573	0	0	1510	1555
Adj Flow Rate, veh/h				174	1803	56	34	212	0	0	304	172
Adj No. of Lanes				0	3	0	0	1	0	0	1	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	3	0	3	3	0	0	3	3
Cap, veh/h				202	2230	71	55	215	0	0	252	142
Arrive On Green				0.18	0.18	0.18	0.11	0.11	0.00	0.00	0.11	0.11
Sat Flow, veh/h				364	4030	129	0	659	0	0	771	436
Grp Volume(v), veh/h				743	621	669	246	0	0	0	0	476
Grp Sat Flow(s),veh/h/ln				1555	1431	1537	659	0	0	0	0	1207
Q Serve(g_s), s				34.8	31.0	31.2	0.0	0.0	0.0	0.0	0.0	24.5
Cycle Q Clear(g_c), s				34.8	31.0	31.2	24.5	0.0	0.0	0.0	0.0	24.5
Prop In Lane				0.23		0.08	0.14		0.00	0.00		0.36
Lane Grp Cap(c), veh/h				860	792	850	270	0	0	0	0	394
V/C Ratio(X)				0.86	0.78	0.79	0.91	0.00	0.00	0.00	0.00	1.21
Avail Cap(c_a), veh/h				860	792	850	270	0	0	0	0	394
HCM Platoon Ratio				0.33	0.33	0.33	0.33	0.33	1.00	1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				27.9	26.4	26.4	28.8	0.0	0.0	0.0	0.0	33.5
Incr Delay (d2), s/veh				11.2	7.7	7.3	36.1	0.0	0.0	0.0	0.0	115.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				17.7	14.0	15.0	7.8	0.0	0.0	0.0	0.0	20.8
LnGrp Delay(d),s/veh				39.1	34.0	33.7	64.9	0.0	0.0	0.0	0.0	148.5
LnGrp LOS				D	C	C	E					F
Approach Vol, veh/h					2033			246			476	
Approach Delay, s/veh					35.8			64.9			148.5	
Approach LOS					D			E			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				29.0		46.0		29.0				
Change Period (Y+Rc), s				4.5		4.5		4.5				
Max Green Setting (Gmax), s				24.5		41.5		24.5				
Max Q Clear Time (g_c+I1), s				26.5		36.8		26.5				
Green Ext Time (p_c), s				0.0		3.7		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				57.8								
HCM 2010 LOS				E								


















HCM Signalized Intersection Capacity Analysis
18: Tamalpais & 3rd

Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					  								
Traffic Volume (vph)	0	0	0	235	1799	20	50	50	0	0	50	10	
Future Volume (vph)	0	0	0	235	1799	20	50	50	0	0	50	10	
Ideal Flow (vphpl)	1800	1800	1800	1600	1600	1600	1600	1600	1800	1800	1600	1600	
Lane Width	12	12	12	12	12	12	11	12	12	12	12	12	
Total Lost time (s)					11.6		7.6	7.6			7.6		
Lane Util. Factor					0.91		1.00	1.00			1.00		
Frbp, ped/bikes					1.00		1.00	1.00			0.99		
Flpb, ped/bikes					0.98		0.93	1.00			1.00		
Frt					1.00		1.00	1.00			0.98		
Flt Protected					0.99		0.95	1.00			1.00		
Satd. Flow (prot)					3714		1060	1237			1191		
Flt Permitted					0.99		0.71	1.00			1.00		
Satd. Flow (perm)					3714		797	1237			1191		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	255	1955	22	54	54	0	0	54	11	
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	6	0	
Lane Group Flow (vph)	0	0	0	0	2231	0	54	54	0	0	59	0	
Confl. Peds. (#/hr)			73	73		38	49		63			49	
Confl. Bikes (#/hr)						2			2			2	
Parking (#/hr)							3	3			3	3	
Turn Type				Perm	NA		Perm	NA			NA		
Protected Phases					6			4			8		
Permitted Phases				6			4						
Actuated Green, G (s)					51.6		19.2	19.2			19.2		
Effective Green, g (s)					51.6		19.2	19.2			19.2		
Actuated g/C Ratio					0.57		0.21	0.21			0.21		
Clearance Time (s)					11.6		7.6	7.6			7.6		
Lane Grp Cap (vph)					2129		170	263			254		
v/s Ratio Prot								0.04			0.05		
v/s Ratio Perm					0.60		c0.07						
v/c Ratio					1.05		0.32	0.21			0.23		
Uniform Delay, d1					19.2		29.9	29.1			29.3		
Progression Factor					1.00		1.00	1.00			1.00		
Incremental Delay, d2					33.4		4.9	1.8			2.1		
Delay (s)					52.6		34.7	30.9			31.4		
Level of Service					D		C	C			C		
Approach Delay (s)		0.0			52.6			32.8			31.4		
Approach LOS		A			D			C			C		
Intersection Summary													
HCM 2000 Control Delay			51.2		HCM 2000 Level of Service						D		
HCM 2000 Volume to Capacity ratio			0.85										
Actuated Cycle Length (s)			90.0		Sum of lost time (s)						19.2		
Intersection Capacity Utilization			145.8%		ICU Level of Service						H		
Analysis Period (min)			15										
c Critical Lane Group													













HCM 2010 Signalized Intersection Summary
19: Hetherton & 3rd

Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	420	1553	0	0	0	0	0	750	446
Future Volume (veh/h)	0	0	0	420	1553	0	0	0	0	0	750	446
Number				1	6	16				3	8	18
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.83
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1545	1573	0				0	1573	1485
Adj Flow Rate, veh/h				457	1688	0				0	815	475
Adj No. of Lanes				1	3	0				0	3	1
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				763	2139	0				0	1832	446
Arrive On Green				0.15	0.15	0.00				0.00	0.14	0.14
Sat Flow, veh/h				1471	4718	0				0	4435	1045
Grp Volume(v), veh/h				457	1688	0				0	815	475
Grp Sat Flow(s),veh/h/ln				1471	1573	0				0	1431	1045
Q Serve(g_s), s				22.1	25.9	0.0				0.0	13.0	32.0
Cycle Q Clear(g_c), s				22.1	25.9	0.0				0.0	13.0	32.0
Prop In Lane				1.00		0.00				0.00		1.00
Lane Grp Cap(c), veh/h				763	2139	0				0	1832	446
V/C Ratio(X)				0.60	0.79	0.00				0.00	0.44	1.07
Avail Cap(c_a), veh/h				763	2139	0				0	1832	446
HCM Platoon Ratio				0.33	0.33	1.00				1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				26.8	28.4	0.0				0.0	24.1	32.2
Incr Delay (d2), s/veh				3.5	3.1	0.0				0.0	0.8	61.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				9.7	11.9	0.0				0.0	5.3	16.8
LnGrp Delay(d),s/veh				30.3	31.5	0.0				0.0	24.9	93.3
LnGrp LOS				C	C						C	F
Approach Vol, veh/h					2145						1290	
Approach Delay, s/veh					31.2						50.1	
Approach LOS					C						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs						6		8				
Phs Duration (G+Y+Rc), s						38.0		37.0				
Change Period (Y+Rc), s						4.0		5.0				
Max Green Setting (Gmax), s						34.0		32.0				
Max Q Clear Time (g_c+I1), s						27.9		34.0				
Green Ext Time (p_c), s						4.8		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay					38.3							
HCM 2010 LOS					D							
Notes												
User approved volume balancing among the lanes for turning movement.												

















HCM 2010 Signalized Intersection Summary
 20: Irwin & 3rd/3rd St

Baseline Plus BioMarin Only Conditions
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑	↑	↑↑↑				
Traffic Volume (veh/h)	0	0	0	0	1025	120	958	1151	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1025	120	958	1151	0	0	0	0
Number				1	6	16	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.94	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1485	1485	1398	1398	0			
Adj Flow Rate, veh/h				0	1114	98	1041	1251	0			
Adj No. of Lanes				0	3	1	2	2	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	3	3	3	3	0			
Cap, veh/h				0	1379	403	1438	1510	0			
Arrive On Green				0.00	0.34	0.34	0.18	0.18	0.00			
Sat Flow, veh/h				0	4189	1186	2663	2796	0			
Grp Volume(v), veh/h				0	1114	98	1041	1251	0			
Grp Sat Flow(s),veh/h/ln				0	1352	1186	1331	1398	0			
Q Serve(g_s), s				0.0	18.7	4.5	27.7	32.4	0.0			
Cycle Q Clear(g_c), s				0.0	18.7	4.5	27.7	32.4	0.0			
Prop In Lane				0.00		1.00	1.00		0.00			
Lane Grp Cap(c), veh/h				0	1379	403	1438	1510	0			
V/C Ratio(X)				0.00	0.81	0.24	0.72	0.83	0.00			
Avail Cap(c_a), veh/h				0	1379	403	1438	1510	0			
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	22.5	17.8	25.5	27.5	0.0			
Incr Delay (d2), s/veh				0.0	5.2	1.4	3.2	5.4	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	7.6	1.6	10.9	13.6	0.0			
LnGrp Delay(d),s/veh				0.0	27.7	19.2	28.7	32.9	0.0			
LnGrp LOS					C	B	C	C				
Approach Vol, veh/h					1212			2292				
Approach Delay, s/veh					27.0			31.0				
Approach LOS					C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				45.0		30.0						
Change Period (Y+Rc), s				4.5		4.5						
Max Green Setting (Gmax), s				40.5		25.5						
Max Q Clear Time (g_c+I1), s				34.4		20.7						
Green Ext Time (p_c), s				5.1		2.7						
Intersection Summary												
HCM 2010 Ctrl Delay				29.6								
HCM 2010 LOS				C								
Notes												


















HCM 2010 Signalized Intersection Summary
21: D & 2nd

Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1931	80	0	0	0	0	0	255	70	450	0
Future Volume (veh/h)	0	1931	80	0	0	0	0	0	255	70	450	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1660	1710				0	1573	1620	1748	1748	0
Adj Flow Rate, veh/h	0	2099	80				0	0	261	76	489	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	0	0	0				0	0	1126	1125	1488	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.85	0.28	0.28	0.00
Sat Flow, veh/h		0					0	0	1323	1095	1748	0
Grp Volume(v), veh/h		0.0					0	0	261	76	489	0
Grp Sat Flow(s),veh/h/ln							0	0	1323	1095	1748	0
Q Serve(g_s), s							0.0	0.0	1.1	1.6	6.9	0.0
Cycle Q Clear(g_c), s							0.0	0.0	1.1	2.7	6.9	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	1126	1125	1488	0
V/C Ratio(X)							0.00	0.00	0.23	0.07	0.33	0.00
Avail Cap(c_a), veh/h							0	0	1126	1125	1488	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh							0.0	0.0	0.4	3.1	4.1	0.0
Incr Delay (d2), s/veh							0.0	0.0	0.5	0.1	0.6	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	0.5	0.5	3.6	0.0
LnGrp Delay(d),s/veh							0.0	0.0	0.9	3.2	4.7	0.0
LnGrp LOS									A	A	A	
Approach Vol, veh/h								261			565	
Approach Delay, s/veh								0.9			4.5	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				31.0				31.0				
Change Period (Y+Rc), s				4.6				4.6				
Max Green Setting (Gmax), s				26.4				26.4				
Max Q Clear Time (g_c+I1), s				8.9				3.1				
Green Ext Time (p_c), s				1.4				0.7				
Intersection Summary												
HCM 2010 Ctrl Delay			3.4									
HCM 2010 LOS			A									













HCM 2010 Signalized Intersection Summary
22: C & 2nd

Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						 				
Traffic Volume (veh/h)	110	2146	0	0	0	0	0	200	90	0	0	0
Future Volume (veh/h)	110	2146	0	0	0	0	0	200	90	0	0	0
Number	1	6	16				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1440	1485	0				0	1485	1440			
Adj Flow Rate, veh/h	120	2333	0				0	217	94			
Adj No. of Lanes	0	3	0				0	2	0			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0				0	3	3			
Cap, veh/h	158	2406	0				0	549	228			
Arrive On Green	0.20	0.20	0.00				0.00	0.28	0.28			
Sat Flow, veh/h	171	3975	0				0	1978	823			
Grp Volume(v), veh/h	866	1587	0				0	161	150			
Grp Sat Flow(s),veh/h/ln	1443	1352	0				0	1485	1315			
Q Serve(g_s), s	38.6	43.7	0.0				0.0	6.6	7.0			
Cycle Q Clear(g_c), s	44.9	43.7	0.0				0.0	6.6	7.0			
Prop In Lane	0.14		0.00				0.00		0.63			
Lane Grp Cap(c), veh/h	928	1637	0				0	412	365			
V/C Ratio(X)	0.93	0.97	0.00				0.00	0.39	0.41			
Avail Cap(c_a), veh/h	928	1637	0				0	412	365			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(l)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	29.7	29.3	0.0				0.0	22.0	22.1			
Incr Delay (d2), s/veh	17.2	16.2	0.0				0.0	2.8	3.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	22.4	20.1	0.0				0.0	3.0	2.9			
LnGrp Delay(d),s/veh	46.9	45.5	0.0				0.0	24.7	25.5			
LnGrp LOS	D	D						C	C			
Approach Vol, veh/h		2453						311				
Approach Delay, s/veh		46.0						25.1				
Approach LOS		D						C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				25.0		50.0						
Change Period (Y+Rc), s				* 4.2		4.6						
Max Green Setting (Gmax), s				* 21		45.4						
Max Q Clear Time (g_c+I1), s				9.0		46.9						
Green Ext Time (p_c), s				1.9		0.0						
Intersection Summary												
HCM 2010 Ctrl Delay			43.6									
HCM 2010 LOS			D									
Notes												

















HCM 2010 Signalized Intersection Summary
23: B & 2nd

Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑		↑	↑	
Traffic Volume (veh/h)	0	2161	70	0	0	0	0	0	160	70	220	0
Future Volume (veh/h)	0	2161	70	0	0	0	0	0	160	70	220	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1485	1382				0	1573	1591	1545	1485	0
Adj Flow Rate, veh/h	0	2349	71				0	0	157	76	239	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	0	0	0				0	0	1077	1127	1238	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.83	0.28	0.28	0.00
Sat Flow, veh/h		0					0	0	1292	1061	1485	0
Grp Volume(v), veh/h		0.0					0	0	157	76	239	0
Grp Sat Flow(s),veh/h/ln							0	0	1292	1061	1485	0
Q Serve(g_s), s							0.0	0.0	0.6	1.5	3.3	0.0
Cycle Q Clear(g_c), s							0.0	0.0	0.6	2.1	3.3	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	1077	1127	1238	0
V/C Ratio(X)							0.00	0.00	0.15	0.07	0.19	0.00
Avail Cap(c_a), veh/h							0	0	1077	1127	1238	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh							0.0	0.0	0.4	2.6	2.8	0.0
Incr Delay (d2), s/veh							0.0	0.0	0.3	0.1	0.3	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	0.3	0.5	1.5	0.0
LnGrp Delay(d),s/veh							0.0	0.0	0.7	2.7	3.2	0.0
LnGrp LOS									A	A	A	
Approach Vol, veh/h								157			315	
Approach Delay, s/veh								0.7			3.1	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				27.0				27.0				
Change Period (Y+Rc), s				4.5				4.5				
Max Green Setting (Gmax), s				22.5				22.5				
Max Q Clear Time (g_c+I1), s				5.3				2.6				
Green Ext Time (p_c), s				0.7				0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			2.3									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary
24: A & 2nd

Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	2096	195	0	0	0	0	240	20	50	115	0
Future Volume (veh/h)	90	2096	195	0	0	0	0	240	20	50	115	0
Number	5	2	12				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97				1.00		0.96	0.98		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1748	1800				0	1660	1710	1660	1660	0
Adj Flow Rate, veh/h	98	2278	197				0	261	12	54	125	0
Adj No. of Lanes	0	3	0				0	2	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	102	2494	219				0	685	31	285	530	0
Arrive On Green	0.19	0.19	0.19				0.00	0.22	0.22	0.01	0.11	0.00
Sat Flow, veh/h	180	4423	388				0	3149	140	1581	1660	0
Grp Volume(v), veh/h	945	784	844				0	134	139	54	125	0
Grp Sat Flow(s),veh/h/ln	1739	1590	1663				0	1577	1629	1581	1660	0
Q Serve(g_s), s	40.5	36.1	37.3				0.0	5.4	5.5	0.0	5.2	0.0
Cycle Q Clear(g_c), s	40.5	36.1	37.3				0.0	5.4	5.5	0.0	5.2	0.0
Prop In Lane	0.10		0.23				0.00		0.09	1.00		0.00
Lane Grp Cap(c), veh/h	980	897	937				0	352	364	285	530	0
V/C Ratio(X)	0.96	0.87	0.90				0.00	0.38	0.38	0.19	0.24	0.00
Avail Cap(c_a), veh/h	980	897	937				0	352	364	285	530	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.8	28.0	28.5				0.0	24.8	24.8	28.6	25.2	0.0
Incr Delay (d2), s/veh	21.3	11.6	13.3				0.0	3.1	3.0	1.5	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	25.3	18.8	20.6				0.0	2.6	2.7	1.1	2.5	0.0
LnGrp Delay(d),s/veh	51.1	39.6	41.9				0.0	27.9	27.8	30.0	26.3	0.0
LnGrp LOS	D	D	D					C	C	C	C	
Approach Vol, veh/h		2573						273			179	
Approach Delay, s/veh		44.6						27.8			27.4	
Approach LOS		D						C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		47.0		28.2			7.2	21.0				
Change Period (Y+Rc), s		4.6		* 4.2			* 4.2	* 4.2				
Max Green Setting (Gmax), s		42.4		* 24			* 3	* 17				
Max Q Clear Time (g_c+I1), s		42.5		7.2			2.0	7.5				
Green Ext Time (p_c), s		0.0		0.7			0.0	1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			42.1									
HCM 2010 LOS			D									
Notes												

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

BioMarin
Baseline + BioMarin Only Conditions
AM Peak Hour

Intersection 25 Brooks St/2nd St Side-street Stop


















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	37	30	81.6%	15.6	6.6	C
	Through						
	Right Turn						
	Subtotal	37	30	81.6%	15.6	6.6	C
EB	Left Turn	25	25	98.6%	3.2	0.6	A
	Through	2,151	2,098	97.5%	2.6	0.1	A
	Right Turn						
	Subtotal	2,176	2,122	97.5%	2.6	0.1	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,213	2,152	97.3%	2.8	0.2	A

Intersection 26 Lindaro St/2nd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	52	52	100.5%	16.3	3.1	B
	Right Turn	261	279	106.7%	18.0	4.2	B
	Subtotal	313	331	105.7%	17.8	3.4	B
SB	Left Turn	62	57	92.6%	38.0	5.4	D
	Through	427	407	95.3%	35.7	2.5	D
	Right Turn						
	Subtotal	489	464	95.0%	35.9	2.5	D
EB	Left Turn	41	35	85.3%	11.0	2.9	B
	Through	2,122	2,056	96.9%	12.0	1.2	B
	Right Turn	60	58	96.3%	9.9	3.0	A
	Subtotal	2,223	2,149	96.7%	11.9	1.1	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,025	2,944	97.3%	16.4	0.7	B



















HCM 2010 Signalized Intersection Summary
27: Lincoln & 2nd

Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	2270	40	0	0	0	0	106	50	130	255	0
Future Volume (veh/h)	135	2270	40	0	0	0	0	106	50	130	255	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1398	1398				0	1398	1398	1382	1342	0
Adj Flow Rate, veh/h	147	2467	22				0	115	42	141	277	0
Adj No. of Lanes	0	4	1				0	1	1	0	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	139	2510	598				0	500	411	284	541	0
Arrive On Green	0.18	0.18	0.18				0.00	0.36	0.36	0.12	0.12	0.00
Sat Flow, veh/h	262	4730	1126				0	1398	1151	571	1575	0
Grp Volume(v), veh/h	776	1838	22				0	115	42	215	203	0
Grp Sat Flow(s),veh/h/ln	1385	1202	1126				0	1398	1151	925	1160	0
Q Serve(g_s), s	39.8	37.9	1.2				0.0	4.3	1.8	13.6	12.3	0.0
Cycle Q Clear(g_c), s	39.8	37.9	1.2				0.0	4.3	1.8	17.9	12.3	0.0
Prop In Lane	0.19		1.00				0.00		1.00	0.66		0.00
Lane Grp Cap(c), veh/h	735	1914	598				0	500	411	410	415	0
V/C Ratio(X)	1.06	0.96	0.04				0.00	0.23	0.10	0.53	0.49	0.00
Avail Cap(c_a), veh/h	735	1914	598				0	500	411	410	415	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.9	30.1	15.0				0.0	16.9	16.1	30.3	26.7	0.0
Incr Delay (d2), s/veh	49.1	13.1	0.1				0.0	1.1	0.5	4.7	4.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	25.3	14.9	0.4				0.0	1.8	0.6	4.8	4.4	0.0
LnGrp Delay(d),s/veh	80.0	43.2	15.1				0.0	18.0	16.6	35.0	30.8	0.0
LnGrp LOS	F	D	B					B	B	D	C	
Approach Vol, veh/h		2636						157			418	
Approach Delay, s/veh		53.8						17.6			33.0	
Approach LOS		D						B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		44.0		31.0				31.0				
Change Period (Y+Rc), s		* 4.2		* 4.2				* 4.2				
Max Green Setting (Gmax), s		* 40		* 27				* 27				
Max Q Clear Time (g_c+I1), s		41.8		6.3				19.9				
Green Ext Time (p_c), s		0.0		0.5				1.0				
Intersection Summary												
HCM 2010 Ctrl Delay			49.3									
HCM 2010 LOS			D									
Notes												

















HCM 2010 Signalized Intersection Summary
 28: Francisco W./Tamalpais & 2nd

Baseline Plus BioMarin Only Conditions
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	2325	60	0	0	0	0	50	250	110	180	0
Future Volume (veh/h)	50	2325	60	0	0	0	0	50	250	110	180	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1398	1398				0	1398	1454	1398	1398	0
Adj Flow Rate, veh/h	54	2527	39				0	54	233	120	196	0
Adj No. of Lanes	0	4	1				0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	59	2940	651				0	317	273	265	317	0
Arrive On Green	0.20	0.20	0.20				0.00	0.23	0.23	0.07	0.07	0.00
Sat Flow, veh/h	98	4902	1086				0	1398	1203	862	1398	0
Grp Volume(v), veh/h	769	1812	39				0	54	233	120	196	0
Grp Sat Flow(s),veh/h/ln	1393	1202	1086				0	1398	1203	862	1398	0
Q Serve(g_s), s	40.6	36.2	2.2				0.0	2.3	13.9	10.2	10.2	0.0
Cycle Q Clear(g_c), s	40.6	36.2	2.2				0.0	2.3	13.9	12.6	10.2	0.0
Prop In Lane	0.07		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	835	2163	651				0	317	273	265	317	0
V/C Ratio(X)	0.92	0.84	0.06				0.00	0.17	0.85	0.45	0.62	0.00
Avail Cap(c_a), veh/h	835	2163	651				0	569	489	420	569	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	0.09	0.09	0.09				0.00	1.00	1.00	0.97	0.97	0.00
Uniform Delay (d), s/veh	28.3	26.6	12.9				0.0	23.3	27.8	33.8	31.5	0.0
Incr Delay (d2), s/veh	2.1	0.4	0.0				0.0	0.3	7.4	1.2	1.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.2	12.2	0.7				0.0	0.9	5.2	2.5	4.1	0.0
LnGrp Delay(d),s/veh	30.5	27.0	12.9				0.0	23.6	35.2	34.9	33.4	0.0
LnGrp LOS	C	C	B					C	D	C	C	
Approach Vol, veh/h		2620						287			316	
Approach Delay, s/veh		27.8						33.0			34.0	
Approach LOS		C						C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		51.5		23.5				23.5				
Change Period (Y+Rc), s		6.5		6.5				6.5				
Max Green Setting (Gmax), s		31.5		30.5				30.5				
Max Q Clear Time (g_c+I1), s		42.6		15.9				14.6				
Green Ext Time (p_c), s		0.0		1.1				1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			28.9									
HCM 2010 LOS			C									

















HCM 2010 Signalized Intersection Summary
 29: 101 SBO n 2nd/Hetherton & 2nd/2nd St

Baseline Plus BioMarin Only Conditions
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1171	1354	0	0	0	0	0	0	195	975	0
Future Volume (veh/h)	0	1171	1354	0	0	0	0	0	0	195	975	0
Number	5	2	12							7	4	14
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1485	1485							1485	1485	0
Adj Flow Rate, veh/h	0	1273	1447							212	1060	0
Adj No. of Lanes	0	3	2							1	2	0
Peak Hour Factor	0.92	0.92	0.92							0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3							3	3	0
Cap, veh/h	0	2050	1162							519	1089	0
Arrive On Green	0.00	0.15	0.15							0.12	0.12	0.00
Sat Flow, veh/h	0	4456	2525							1415	2971	0
Grp Volume(v), veh/h	0	1273	1447							212	1060	0
Grp Sat Flow(s),veh/h/ln	0	1485	1263							1415	1485	0
Q Serve(g_s), s	0.0	20.1	34.5							10.4	26.7	0.0
Cycle Q Clear(g_c), s	0.0	20.1	34.5							10.4	26.7	0.0
Prop In Lane	0.00		1.00							1.00		0.00
Lane Grp Cap(c), veh/h	0	2050	1162							519	1089	0
V/C Ratio(X)	0.00	0.62	1.25							0.41	0.97	0.00
Avail Cap(c_a), veh/h	0	2050	1162							519	1089	0
HCM Platoon Ratio	1.00	0.33	0.33							0.33	0.33	1.00
Upstream Filter(l)	0.00	0.12	0.12							0.81	0.81	0.00
Uniform Delay (d), s/veh	0.0	25.7	31.8							25.4	32.6	0.0
Incr Delay (d2), s/veh	0.0	0.2	111.5							0.4	18.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.3	30.0							4.1	13.8	0.0
LnGrp Delay(d),s/veh	0.0	25.9	143.3							25.9	51.0	0.0
LnGrp LOS		C	F							C	D	
Approach Vol, veh/h		2720									1272	
Approach Delay, s/veh		88.4									46.8	
Approach LOS		F									D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		43.0		32.0								
Change Period (Y+Rc), s		8.5		4.5								
Max Green Setting (Gmax), s		34.5		27.5								
Max Q Clear Time (g_c+I1), s		36.5		28.7								
Green Ext Time (p_c), s		0.0		0.0								
Intersection Summary												
HCM 2010 Ctrl Delay			75.1									
HCM 2010 LOS			E									
Notes												





















HCM 2010 Signalized Intersection Summary
30: Irwin & 2nd St

Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	721	815	0	0	0	0	0	1398	460	0	0	0
Future Volume (veh/h)	721	815	0	0	0	0	0	1398	460	0	0	0
Number	5	2	12				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1454	1485	0				0	1398	1398			
Adj Flow Rate, veh/h	784	886	0				0	1520	450			
Adj No. of Lanes	2	2	0				0	3	1			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0				0	3	3			
Cap, veh/h	1440	1339	0				0	1618	499			
Arrive On Green	0.15	0.15	0.00				0.00	0.42	0.42			
Sat Flow, veh/h	2769	2971	0				0	3943	1176			
Grp Volume(v), veh/h	784	886	0				0	1520	450			
Grp Sat Flow(s),veh/h/ln	1385	1485	0				0	1272	1176			
Q Serve(g_s), s	19.9	21.1	0.0				0.0	28.6	26.8			
Cycle Q Clear(g_c), s	19.9	21.1	0.0				0.0	28.6	26.8			
Prop In Lane	1.00		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	1440	1339	0				0	1618	499			
V/C Ratio(X)	0.54	0.66	0.00				0.00	0.94	0.90			
Avail Cap(c_a), veh/h	1440	1339	0				0	1618	499			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	26.0	26.5	0.0				0.0	20.7	20.2			
Incr Delay (d2), s/veh	1.5	2.6	0.0				0.0	12.0	22.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.0	9.2	0.0				0.0	11.8	11.7			
LnGrp Delay(d),s/veh	27.5	29.1	0.0				0.0	32.6	42.4			
LnGrp LOS	C	C						C	D			
Approach Vol, veh/h		1670						1970				
Approach Delay, s/veh		28.4						34.9				
Approach LOS		C						C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		38.0		37.0								
Change Period (Y+Rc), s		* 4.2		* 5.2								
Max Green Setting (Gmax), s		* 34		* 32								
Max Q Clear Time (g_c+I1), s		23.1		30.6								
Green Ext Time (p_c), s		8.8		1.2								
Intersection Summary												
HCM 2010 Ctrl Delay			31.9									
HCM 2010 LOS			C									
Notes												

HCM 2010 Signalized Intersection Summary
31: Lindaro & Andersen

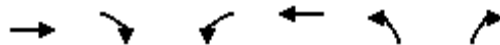
Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	20	310	50	5	80	210	63	50	279	150	61	201
Future Volume (veh/h)	20	310	50	5	80	210	63	50	279	150	61	201
Number	5	2	12		1	6	16	3	8	18	7	4
Initial Q (Qb), veh	0	0	0		0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94		1.00		0.97	1.00		0.97	1.00	
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	2019	2019	2000		1942	1942	2000	1845	1845	1900	1845	1845
Adj Flow Rate, veh/h	22	337	46		87	228	55	54	303	139	66	218
Adj No. of Lanes	1	1	0		1	1	0	1	1	0	1	1
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
Percent Heavy Veh, %	3	3	3		3	3	3	3	3	3	3	3
Cap, veh/h	58	420	57		158	448	108	152	368	169	170	536
Arrive On Green	0.03	0.24	0.24		0.09	0.30	0.30	0.09	0.31	0.31	0.10	0.32
Sat Flow, veh/h	1923	1726	236		1849	1503	362	1757	1185	543	1757	1668
Grp Volume(v), veh/h	22	0	383		87	0	283	54	0	442	66	0
Grp Sat Flow(s),veh/h/ln	1923	0	1961		1849	0	1865	1757	0	1728	1757	0
Q Serve(g_s), s	0.7	0.0	11.9		2.9	0.0	8.1	1.9	0.0	15.4	2.3	0.0
Cycle Q Clear(g_c), s	0.7	0.0	11.9		2.9	0.0	8.1	1.9	0.0	15.4	2.3	0.0
Prop In Lane	1.00		0.12		1.00		0.19	1.00		0.31	1.00	
Lane Grp Cap(c), veh/h	58	0	477		158	0	557	152	0	538	170	0
V/C Ratio(X)	0.38	0.00	0.80		0.55	0.00	0.51	0.36	0.00	0.82	0.39	0.00
Avail Cap(c_a), veh/h	237	0	669		285	0	693	244	0	714	244	0
HCM Platoon Ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00		1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.8	0.0	23.1		28.5	0.0	18.8	27.9	0.0	20.7	27.5	0.0
Incr Delay (d2), s/veh	1.5	0.0	4.8		1.1	0.0	0.7	0.5	0.0	5.8	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	7.0		1.5	0.0	4.3	0.9	0.0	8.1	1.1	0.0
LnGrp Delay(d),s/veh	32.3	0.0	27.9		29.6	0.0	19.5	28.4	0.0	26.5	28.0	0.0
LnGrp LOS	C		C		C		B	C		C	C	
Approach Vol, veh/h		405				370			496			302
Approach Delay, s/veh		28.1				21.9			26.7			19.9
Approach LOS		C				C			C			B
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.5	20.7	9.6	25.0	6.0	24.2	10.3	24.4				
Change Period (Y+Rc), s	4.0	4.9	4.0	* 4.2	4.0	4.9	4.0	* 4.2				
Max Green Setting (Gmax), s	10.0	22.1	9.0	* 27	8.0	24.1	9.0	* 27				
Max Q Clear Time (g_c+I1), s	4.9	13.9	3.9	8.6	2.7	10.1	4.3	17.4				
Green Ext Time (p_c), s	0.1	1.1	0.0	0.9	0.0	0.9	0.0	1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			24.6									
HCM 2010 LOS			C									
Notes												

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	20
Future Volume (veh/h)	20
Number	14
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	0.91
Parking Bus, Adj	1.00
Adj Sat Flow, veh/h/ln	1900
Adj Flow Rate, veh/h	18
Adj No. of Lanes	0
Peak Hour Factor	0.92
Percent Heavy Veh, %	3
Cap, veh/h	44
Arrive On Green	0.32
Sat Flow, veh/h	138
Grp Volume(v), veh/h	236
Grp Sat Flow(s),veh/h/ln	1805
Q Serve(g_s), s	6.6
Cycle Q Clear(g_c), s	6.6
Prop In Lane	0.08
Lane Grp Cap(c), veh/h	580
V/C Ratio(X)	0.41
Avail Cap(c_a), veh/h	746
HCM Platoon Ratio	1.00
Upstream Filter(l)	1.00
Uniform Delay (d), s/veh	17.2
Incr Delay (d2), s/veh	0.5
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	3.4
LnGrp Delay(d),s/veh	17.6
LnGrp LOS	B
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	

HCM Signalized Intersection Capacity Analysis
32: Tamalpais & Mission

Baseline Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	
Traffic Volume (vph)	545	25	0	690	25	5
Future Volume (vph)	545	25	0	690	25	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.6			3.0	5.2	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	0.98	
Frt	0.99			1.00	0.98	
Flt Protected	1.00			1.00	0.96	
Satd. Flow (prot)	1560			1573	1441	
Flt Permitted	1.00			1.00	0.96	
Satd. Flow (perm)	1560			1573	1441	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	592	27	0	750	27	5
RTOR Reduction (vph)	2	0	0	0	4	0
Lane Group Flow (vph)	617	0	0	750	28	0
Confl. Peds. (#/hr)		10	10		10	
Turn Type	NA			NA	Perm	
Protected Phases	2			3 4 6		
Permitted Phases					8	
Actuated Green, G (s)	30.1			51.2	13.4	
Effective Green, g (s)	30.1			45.6	13.4	
Actuated g/C Ratio	0.40			0.61	0.18	
Clearance Time (s)	5.6				5.2	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	626			956	257	
v/s Ratio Prot	c0.40			c0.48		
v/s Ratio Perm					c0.02	
v/c Ratio	0.98			0.78	0.11	
Uniform Delay, d1	22.2			11.0	25.8	
Progression Factor	0.78			0.69	1.05	
Incremental Delay, d2	28.6			0.4	0.2	
Delay (s)	46.0			7.9	27.3	
Level of Service	D			A	C	
Approach Delay (s)	46.0			7.9	27.3	
Approach LOS	D			A	C	

















Intersection Summary

HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
33: Tamalpais & 5th

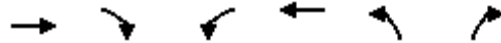
Baseline Plus BioMarin Only Conditions

Timing Plan: AM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	0	365	20	0	330	50	10	10	10	5	25	20	
Future Volume (vph)	0	365	20	0	330	50	10	10	10	5	25	20	
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Total Lost time (s)		5.6			5.6			5.6			5.6		
Lane Util. Factor		1.00			1.00			1.00			1.00		
Frbp, ped/bikes		1.00			0.99			1.00			0.98		
Flpb, ped/bikes		1.00			1.00			0.99			1.00		
Frt		0.99			0.98			0.95			0.94		
Flt Protected		1.00			1.00			0.98			1.00		
Satd. Flow (prot)		1558			1536			1466			1452		
Flt Permitted		1.00			1.00			0.87			0.97		
Satd. Flow (perm)		1558			1536			1293			1409		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	397	22	0	359	54	11	11	11	5	27	22	
RTOR Reduction (vph)	0	2	0	0	5	0	0	10	0	0	20	0	
Lane Group Flow (vph)	0	417	0	0	408	0	0	23	0	0	34	0	
Confl. Peds. (#/hr)	10		10	10		10	10					10	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			4	6		8			8		
Permitted Phases							8			8			
Actuated Green, G (s)		39.8			56.0			7.8			7.8		
Effective Green, g (s)		39.8			56.0			7.8			7.8		
Actuated g/C Ratio		0.53			0.75			0.10			0.10		
Clearance Time (s)		5.6						5.6			5.6		
Vehicle Extension (s)		3.0						1.5			1.5		
Lane Grp Cap (vph)		826			1146			134			146		
v/s Ratio Prot		c0.27			c0.27								
v/s Ratio Perm								0.02			c0.02		
v/c Ratio		0.50			0.36			0.17			0.23		
Uniform Delay, d1		11.3			3.3			30.7			30.9		
Progression Factor		0.72			0.06			0.63			0.83		
Incremental Delay, d2		1.7			0.1			0.2			0.3		
Delay (s)		9.8			0.3			19.4			25.8		
Level of Service		A			A			B			C		
Approach Delay (s)		9.8			0.3			19.4			25.8		
Approach LOS		A			A			B			C		
Intersection Summary													
HCM 2000 Control Delay			6.8									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.46										
Actuated Cycle Length (s)			75.0									Sum of lost time (s)	16.8
Intersection Capacity Utilization			39.8%									ICU Level of Service	A
Analysis Period (min)			15										
c	Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 34: Tamalpais & Mission

Baseline Plus BioMarin Only Conditions
 Timing Plan: AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Traffic Volume (vph)	550	0	0	685	5	20
Future Volume (vph)	550	0	0	685	5	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.6			5.6	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.89	
Flt Protected	1.00			1.00	0.99	
Satd. Flow (prot)	1573			1573	1387	
Flt Permitted	1.00			1.00	0.99	
Satd. Flow (perm)	1573			1573	1387	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	598	0	0	745	5	22
RTOR Reduction (vph)	0	0	0	0	17	0
Lane Group Flow (vph)	598	0	0	745	10	0
Confl. Peds. (#/hr)		10				
Turn Type	NA			NA	Prot	
Protected Phases	2 8			6	3 4	
Permitted Phases						
Actuated Green, G (s)	48.7			30.1	15.5	
Effective Green, g (s)	43.5			30.1	15.5	
Actuated g/C Ratio	0.58			0.40	0.21	
Clearance Time (s)				5.6		
Vehicle Extension (s)				3.0		
Lane Grp Cap (vph)	912			631	286	
v/s Ratio Prot	c0.38			c0.47	c0.01	
v/s Ratio Perm						
v/c Ratio	0.66			1.18	0.03	
Uniform Delay, d1	10.7			22.4	23.8	
Progression Factor	0.61			1.15	0.81	
Incremental Delay, d2	0.5			88.9	0.0	
Delay (s)	7.0			114.6	19.3	
Level of Service	A			F	B	
Approach Delay (s)	7.0			114.6	19.3	
Approach LOS	A			F	B	

Intersection Summary			
HCM 2000 Control Delay	65.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

35: Tamalpais & 5th

Baseline Plus BioMarin Only Conditions

Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑			↑			↑					
Traffic Volume (vph)	0	380	0	0	340	20	40	5	25	0	0	0	
Future Volume (vph)	0	380	0	0	340	20	40	5	25	0	0	0	
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Total Lost time (s)		5.6			5.6			5.6					
Lane Util. Factor		1.00			1.00			1.00					
Frbp, ped/bikes		1.00			1.00			0.98					
Flpb, ped/bikes		1.00			1.00			1.00					
Frt		1.00			0.99			0.95					
Flt Protected		1.00			1.00			0.97					
Satd. Flow (prot)		1573			1557			1431					
Flt Permitted		1.00			1.00			0.97					
Satd. Flow (perm)		1573			1557			1431					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	413	0	0	370	22	43	5	27	0	0	0	
RTOR Reduction (vph)	0	0	0	0	2	0	0	23	0	0	0	0	
Lane Group Flow (vph)	0	413	0	0	390	0	0	52	0	0	0	0	
Confl. Peds. (#/hr)	10					10			10				
Turn Type		NA			NA		Split	NA					
Protected Phases		2 8			6		4	4					
Permitted Phases													
Actuated Green, G (s)		53.2			39.8			10.6					
Effective Green, g (s)		53.2			39.8			10.6					
Actuated g/C Ratio		0.71			0.53			0.14					
Clearance Time (s)					5.6			5.6					
Vehicle Extension (s)					3.0			1.5					
Lane Grp Cap (vph)		1115			826			202					
v/s Ratio Prot		c0.26			c0.25			c0.04					
v/s Ratio Perm													
v/c Ratio		0.37			0.47			0.26					
Uniform Delay, d1		4.3			11.0			28.7					
Progression Factor		0.01			0.51			1.27					
Incremental Delay, d2		0.1			1.8			0.2					
Delay (s)		0.1			7.4			36.5					
Level of Service		A			A			D					
Approach Delay (s)		0.1			7.4			36.5			0.0		
Approach LOS		A			A			D			A		
Intersection Summary													
HCM 2000 Control Delay			6.5									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.43										
Actuated Cycle Length (s)			75.0									Sum of lost time (s)	16.8
Intersection Capacity Utilization			39.8%									ICU Level of Service	A
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

Baseline Plus BioMarin Only Conditions

36: Tamalpais & 4th




















Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑			↑				
Traffic Volume (vph)	0	410	0	0	405	75	10	5	10	0	0	0
Future Volume (vph)	0	410	0	0	405	75	10	5	10	0	0	0
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.6			5.6			5.6				
Lane Util. Factor		1.00			1.00			1.00				
Frbp, ped/bikes		1.00			0.98			0.99				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.98			0.94				
Flt Protected		1.00			1.00			0.98				
Satd. Flow (prot)		1573			1512			1441				
Flt Permitted		1.00			1.00			0.98				
Satd. Flow (perm)		1573			1512			1441				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	446	0	0	440	82	11	5	11	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	9	0	0	0	0
Lane Group Flow (vph)	0	446	0	0	514	0	0	18	0	0	0	0
Confl. Peds. (#/hr)	39		22			39			10			
Turn Type		NA			NA		Split	NA				
Protected Phases		2 8			6		4	4				
Permitted Phases												
Actuated Green, G (s)		50.7			32.7			13.5				
Effective Green, g (s)		50.7			32.7			13.5				
Actuated g/C Ratio		0.68			0.44			0.18				
Clearance Time (s)					5.6			5.6				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)		1063			659			259				
v/s Ratio Prot		c0.28			c0.34			c0.01				
v/s Ratio Perm												
v/c Ratio		0.42			0.78			0.07				
Uniform Delay, d1		5.5			18.1			25.5				
Progression Factor		0.06			0.94			1.01				
Incremental Delay, d2		0.3			7.9			0.1				
Delay (s)		0.6			24.9			25.8				
Level of Service		A			C			C				
Approach Delay (s)		0.6			24.9			25.8			0.0	
Approach LOS		A			C			C			A	
Intersection Summary												
HCM 2000 Control Delay			14.0					HCM 2000 Level of Service		B		
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			75.0					Sum of lost time (s)		16.4		
Intersection Capacity Utilization			49.2%					ICU Level of Service		A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
1: Lincoln & Mission

Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	260	465	20	50	530	70	10	490	50	0	360	300
Future Volume (veh/h)	260	465	20	50	530	70	10	490	50	0	360	300
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.93	1.00		0.95
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1676	1676	1710	1676	1676	1710	1800	1694	1728	0	1765	1728
Adj Flow Rate, veh/h	271	484	19	52	552	67	10	510	42	0	375	116
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	0	2	2
Cap, veh/h	180	941	37	435	640	78	53	1125	91	0	968	294
Arrive On Green	0.11	0.59	0.59	0.87	0.87	0.87	0.77	0.77	0.77	0.00	0.39	0.39
Sat Flow, veh/h	1597	1601	63	844	1463	178	18	2904	236	0	2586	759
Grp Volume(v), veh/h	271	0	503	52	0	619	298	0	264	0	250	241
Grp Sat Flow(s),veh/h/ln	1597	0	1664	844	0	1640	1677	0	1480	0	1676	1580
Q Serve(g_s), s	9.0	0.0	14.3	1.0	0.0	15.4	0.0	0.0	5.0	0.0	8.6	8.8
Cycle Q Clear(g_c), s	9.0	0.0	14.3	3.3	0.0	15.4	4.9	0.0	5.0	0.0	8.6	8.8
Prop In Lane	1.00		0.04	1.00		0.11	0.03		0.16	0.00		0.48
Lane Grp Cap(c), veh/h	180	0	978	435	0	718	696	0	574	0	650	612
V/C Ratio(X)	1.51	0.00	0.51	0.12	0.00	0.86	0.43	0.00	0.46	0.00	0.38	0.39
Avail Cap(c_a), veh/h	180	0	978	435	0	718	696	0	574	0	650	612
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.81	0.00	0.81	0.81	0.00	0.81	0.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	0.0	9.8	3.3	0.0	3.8	6.1	0.0	6.1	0.0	17.6	17.7
Incr Delay (d2), s/veh	255.5	0.0	1.9	0.5	0.0	10.9	1.6	0.0	2.2	0.0	1.7	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.7	0.0	7.1	0.3	0.0	8.0	2.4	0.0	2.2	0.0	4.3	4.1
LnGrp Delay(d),s/veh	291.0	0.0	11.7	3.7	0.0	14.6	7.6	0.0	8.2	0.0	19.3	19.6
LnGrp LOS	F		B	A		B	A		A		B	B
Approach Vol, veh/h		774			671			562			491	
Approach Delay, s/veh		109.5			13.8			7.9			19.5	
Approach LOS		F			B			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		51.2		35.8	12.0	39.2		35.8				
Change Period (Y+Rc), s		* 4.2		4.6	3.0	* 4.2		4.6				
Max Green Setting (Gmax), s		* 47		24.4	9.0	* 35		24.4				
Max Q Clear Time (g_c+I1), s		16.3		7.0	11.0	17.4		10.8				
Green Ext Time (p_c), s		5.4		4.6	0.0	6.3		3.5				
Intersection Summary												
HCM 2010 Ctrl Delay			43.2									
HCM 2010 LOS			D									
Notes												

HCM Signalized Intersection Capacity Analysis

2: Hetherton & Mission

Baseline Plus BioMarin Only Conditions

Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑						↑↑	↑
Traffic Volume (vph)	0	490	50	40	175	0	0	0	0	230	1166	450
Future Volume (vph)	0	490	50	40	175	0	0	0	0	230	1166	450
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	10	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		0.95			1.00						0.95	1.00
Frbp, ped/bikes		1.00			1.00						1.00	0.98
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.99			1.00						1.00	0.85
Flt Protected		1.00			0.99						0.99	1.00
Satd. Flow (prot)		2769			1781						2993	1321
Flt Permitted		1.00			0.85						0.99	1.00
Satd. Flow (perm)		2769			1520						2993	1321
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	510	52	42	182	0	0	0	0	240	1215	469
RTOR Reduction (vph)	0	10	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	552	0	0	224	0	0	0	0	0	1455	469
Confl. Peds. (#/hr)			15	15		4			11			
Confl. Bikes (#/hr)			3			3			3			2
Turn Type		NA		Perm	NA					Split	NA	custom
Protected Phases		4			8					2	2	
Permitted Phases				8								5
Actuated Green, G (s)		30.8			30.8						40.4	33.4
Effective Green, g (s)		30.8			30.8						40.4	33.4
Actuated g/C Ratio		0.39			0.39						0.50	0.42
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		1066			585						1511	551
v/s Ratio Prot		c0.20									c0.49	
v/s Ratio Perm					0.15							0.36
v/c Ratio		0.52			0.38						0.96	0.85
Uniform Delay, d1		18.9			17.7						19.1	21.1
Progression Factor		0.34			0.36						1.00	1.00
Incremental Delay, d2		1.6			1.6						15.9	15.2
Delay (s)		8.1			7.9						34.9	36.3
Level of Service		A			A						C	D
Approach Delay (s)		8.1			7.9			0.0			35.3	
Approach LOS		A			A			A			D	

Intersection Summary

HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	96.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Irwin & Mission

Baseline Plus BioMarin Only Conditions

Timing Plan: PM Peak Hour






















Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2	
Lane Configurations											
Traffic Volume (vph)	395	20	305	135	300	20	75	1518	190	50	
Future Volume (vph)	395	20	305	135	300	20	75	1518	190	50	
Ideal Flow (vphpl)	2200	1800	2200	2200	2200	1800	2200	2200	1800	2200	
Lane Width	9	12	10	10	9	12	12	12	12	12	
Total Lost time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Lane Util. Factor		1.00	1.00	1.00	1.00			0.95	1.00		
Frbp, ped/bikes		1.00	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		
Frt		1.00	1.00	1.00	0.85			1.00	0.85		
Flt Protected		0.95	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (prot)		1509	1812	1812	1485			3677	1316		
Flt Permitted		0.63	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (perm)		1000	1812	1812	1485			3677	1316		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	411	21	318	141	312	21	78	1581	198	52	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	38	0	
Lane Group Flow (vph)	0	432	318	141	334	0	0	1659	212	0	
Confl. Peds. (#/hr)							8			3	
Confl. Bikes (#/hr)					4	4					
Turn Type	pm+pt	pm+pt	NA	NA	Prot		Perm	NA	Perm		
Protected Phases	5	5	2	6	6			4			
Permitted Phases	2	2					4			4	
Actuated Green, G (s)		32.8	32.8	16.8	16.8			38.8	38.8		
Effective Green, g (s)		32.8	32.8	16.8	16.8			38.8	38.8		
Actuated g/C Ratio		0.41	0.41	0.21	0.21			0.48	0.48		
Clearance Time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Lane Grp Cap (vph)		485	742	380	311			1783	638		
v/s Ratio Prot		c0.13	0.18	0.08	c0.22						
v/s Ratio Perm		0.23						0.45	0.16		
v/c Ratio		0.89	0.43	0.37	1.07			0.93	0.33		
Uniform Delay, d1		21.7	16.9	27.1	31.6			19.3	12.6		
Progression Factor		0.72	0.75	1.00	1.00			0.45	0.23		
Incremental Delay, d2		16.7	1.3	2.8	72.1			6.5	0.8		
Delay (s)		32.5	14.0	29.8	103.7			15.1	3.7		
Level of Service		C	B	C	F			B	A		
Approach Delay (s)			24.7	81.8				13.6			
Approach LOS			C	F				B			
Intersection Summary											
HCM 2000 Control Delay			26.6							HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.98								
Actuated Cycle Length (s)			80.0							Sum of lost time (s)	12.6
Intersection Capacity Utilization			99.0%							ICU Level of Service	F
Analysis Period (min)			15								

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
4: Lincoln & 5th

Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	370	40	30	250	50	40	420	50	60	330	40
Future Volume (veh/h)	80	370	40	30	250	50	40	420	50	60	330	40
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	1.00		0.98	0.98		0.92	0.98		0.92
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1412	1560	1530	1412	1500	1530	1440	1500	1469	1440	1500	1469
Adj Flow Rate, veh/h	83	385	37	31	260	43	42	438	41	62	344	32
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	520	706	68	333	632	104	104	890	81	159	778	73
Arrive On Green	0.50	0.50	0.50	1.00	1.00	1.00	0.76	0.76	0.76	0.76	0.76	0.76
Sat Flow, veh/h	852	1398	134	768	1251	207	138	2342	214	268	2047	192
Grp Volume(v), veh/h	83	0	422	31	0	303	271	0	250	219	0	219
Grp Sat Flow(s),veh/h/ln	852	0	1532	768	0	1457	1389	0	1306	1194	0	1313
Q Serve(g_s), s	4.3	0.0	15.1	1.3	0.0	0.0	0.0	0.0	5.9	0.5	0.0	4.8
Cycle Q Clear(g_c), s	4.3	0.0	15.1	16.4	0.0	0.0	5.4	0.0	5.9	6.5	0.0	4.8
Prop In Lane	1.00		0.09	1.00		0.14	0.15		0.16	0.28		0.15
Lane Grp Cap(c), veh/h	520	0	774	333	0	736	580	0	496	512	0	499
V/C Ratio(X)	0.16	0.00	0.55	0.09	0.00	0.41	0.47	0.00	0.50	0.43	0.00	0.44
Avail Cap(c_a), veh/h	520	0	774	333	0	736	580	0	496	512	0	499
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.97	0.00	0.97	0.84	0.00	0.84	0.75	0.00	0.75
Uniform Delay (d), s/veh	10.9	0.0	13.5	3.0	0.0	0.0	6.6	0.0	6.7	6.4	0.0	6.5
Incr Delay (d2), s/veh	0.7	0.0	2.8	0.5	0.0	1.7	2.3	0.0	3.1	2.0	0.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	6.9	0.3	0.0	0.3	2.5	0.0	2.4	1.9	0.0	1.9
LnGrp Delay(d),s/veh	11.5	0.0	16.3	3.6	0.0	1.7	8.9	0.0	9.7	8.4	0.0	8.6
LnGrp LOS	B		B	A		A	A		A	A		A
Approach Vol, veh/h		505			334			521			438	
Approach Delay, s/veh		15.5			1.8			9.3			8.5	
Approach LOS		B			A			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		45.0		35.0		45.0		35.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		40.4		30.4		40.4		30.4				
Max Q Clear Time (g_c+I1), s		17.1		7.9		18.4		8.5				
Green Ext Time (p_c), s		2.5		2.3		1.5		2.0				
Intersection Summary												
HCM 2010 Ctrl Delay			9.5									
HCM 2010 LOS			A									

HCM Signalized Intersection Capacity Analysis

5: Hetherton & 5th

Baseline Plus BioMarin Only Conditions


















Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔					↔↔↔	↔↔↔	↔
Traffic Volume (vph)	0	325	180	60	170	0	0	0	0	50	1076	130
Future Volume (vph)	0	325	180	60	170	0	0	0	0	50	1076	130
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		1.00			1.00						0.91	1.00
Frbp, ped/bikes		0.99			1.00						1.00	0.96
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.95			1.00						1.00	0.85
Flt Protected		1.00			0.99						1.00	1.00
Satd. Flow (prot)		1697			1775						4163	1148
Flt Permitted		1.00			0.67						1.00	1.00
Satd. Flow (perm)		1697			1213						4163	1148
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	339	188	62	177	0	0	0	0	52	1121	135
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	508	0	0	240	0	0	0	0	0	1173	135
Confl. Peds. (#/hr)	12		12	12		12			12	12		7
Confl. Bikes (#/hr)			6			4			2			2
Parking (#/hr)											2	2
Turn Type		NA		Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases				8						2		5
Actuated Green, G (s)		35.8			35.8						35.4	28.4
Effective Green, g (s)		35.8			35.8						35.4	28.4
Actuated g/C Ratio		0.45			0.45						0.44	0.35
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		759			542						1842	407
v/s Ratio Prot		c0.30										
v/s Ratio Perm					0.20						0.28	0.12
v/c Ratio		0.67			0.44						0.64	0.33
Uniform Delay, d1		17.4			15.2						17.3	18.9
Progression Factor		0.32			1.00						0.35	0.43
Incremental Delay, d2		4.4			2.1						0.6	0.8
Delay (s)		10.0			17.3						6.7	9.0
Level of Service		B			B						A	A
Approach Delay (s)		10.0			17.3			0.0			6.9	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			8.9								A	
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			80.0							10.8		
Intersection Capacity Utilization			91.2%								F	
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												





















HCM 2010 Signalized Intersection Summary
6: Irwin & 5th

Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	150	0	0	130	110	90	1463	20	0	0	0
Future Volume (veh/h)	245	150	0	0	130	110	90	1463	20	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.96			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1588	1588	0	0	1588	1620	1620	1588	1620			
Adj Flow Rate, veh/h	255	156	0	0	135	107	94	1524	19			
Adj No. of Lanes	1	1	0	0	1	0	0	3	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	2	0	2	0			
Cap, veh/h	358	643	0	0	285	226	119	2061	26			
Arrive On Green	0.68	0.68	0.00	0.00	0.41	0.41	0.16	0.16	0.16			
Sat Flow, veh/h	1015	1588	0	0	703	557	248	4294	55			
Grp Volume(v), veh/h	255	156	0	0	0	242	596	498	543			
Grp Sat Flow(s),veh/h/ln	1015	1588	0	0	0	1260	1576	1445	1576			
Q Serve(g_s), s	19.4	3.0	0.0	0.0	0.0	11.3	29.1	26.2	26.2			
Cycle Q Clear(g_c), s	30.7	3.0	0.0	0.0	0.0	11.3	29.1	26.2	26.2			
Prop In Lane	1.00		0.00	0.00		0.44	0.16		0.04			
Lane Grp Cap(c), veh/h	358	643	0	0	0	510	756	694	757			
V/C Ratio(X)	0.71	0.24	0.00	0.00	0.00	0.47	0.79	0.72	0.72			
Avail Cap(c_a), veh/h	358	643	0	0	0	510	756	694	757			
HCM Platoon Ratio	1.67	1.67	1.00	1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	18.1	8.2	0.0	0.0	0.0	17.5	29.8	28.5	28.5			
Incr Delay (d2), s/veh	11.5	0.9	0.0	0.0	0.0	3.1	8.2	6.3	5.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.5	1.5	0.0	0.0	0.0	4.3	14.4	11.7	12.6			
LnGrp Delay(d),s/veh	29.6	9.1	0.0	0.0	0.0	20.7	37.9	34.8	34.3			
LnGrp LOS	C	A				C	D	C	C			
Approach Vol, veh/h		411			242			1637				
Approach Delay, s/veh		21.8			20.7			35.8				
Approach LOS		C			C			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		37.0		43.0		37.0						
Change Period (Y+Rc), s		4.6		4.6		4.6						
Max Green Setting (Gmax), s		32.4		38.4		32.4						
Max Q Clear Time (g_c+I1), s		32.7		31.1		13.3						
Green Ext Time (p_c), s		0.0		4.4		1.0						
Intersection Summary												
HCM 2010 Ctrl Delay			31.7									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary
7: Lincoln & 4th

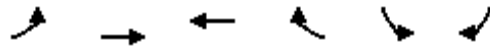
Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	230	40	105	250	70	30	400	85	45	290	65
Future Volume (veh/h)	55	230	40	105	250	70	30	400	85	45	290	65
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.91	0.97		0.91	0.92		0.83	0.96		0.83
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1588	1525	1620	1588	1588	1620	1620	1588	1555	1620	1588	1555
Adj Flow Rate, veh/h	57	240	34	109	260	59	31	417	67	47	302	47
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	390	657	93	472	626	142	85	902	140	121	719	119
Arrive On Green	0.51	0.51	0.51	0.17	0.17	0.17	0.13	0.13	0.13	0.77	0.77	0.77
Sat Flow, veh/h	937	1288	182	960	1227	278	92	2344	363	170	1867	309
Grp Volume(v), veh/h	57	0	274	109	0	319	277	0	238	196	0	200
Grp Sat Flow(s),veh/h/ln	937	0	1471	960	0	1505	1509	0	1290	1030	0	1316
Q Serve(g_s), s	3.5	0.0	9.0	8.2	0.0	15.2	0.0	0.0	13.7	3.3	0.0	4.0
Cycle Q Clear(g_c), s	18.7	0.0	9.0	17.2	0.0	15.2	12.9	0.0	13.7	17.0	0.0	4.0
Prop In Lane	1.00		0.12	1.00		0.18	0.11		0.28	0.24		0.24
Lane Grp Cap(c), veh/h	390	0	750	472	0	768	631	0	497	452	0	507
V/C Ratio(X)	0.15	0.00	0.37	0.23	0.00	0.42	0.44	0.00	0.48	0.43	0.00	0.39
Avail Cap(c_a), veh/h	390	0	750	472	0	768	631	0	497	452	0	507
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.92	0.00	0.92	0.87	0.00	0.87	0.85	0.00	0.85
Uniform Delay (d), s/veh	19.7	0.0	11.8	27.5	0.0	22.6	27.1	0.0	27.5	7.0	0.0	6.1
Incr Delay (d2), s/veh	0.8	0.0	1.4	1.1	0.0	1.5	1.9	0.0	2.9	2.6	0.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	3.9	2.3	0.0	6.7	6.0	0.0	5.3	1.5	0.0	1.6
LnGrp Delay(d),s/veh	20.5	0.0	13.2	28.5	0.0	24.1	29.1	0.0	30.3	9.6	0.0	8.1
LnGrp LOS	C		B	C		C	C		C	A		A
Approach Vol, veh/h		331			428			515			396	
Approach Delay, s/veh		14.4			25.3			29.6			8.8	
Approach LOS		B			C			C			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		45.0		35.0		45.0		35.0				
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2		* 4.2				
Max Green Setting (Gmax), s		* 41		* 31		* 41		* 31				
Max Q Clear Time (g_c+I1), s		20.7		15.7		19.2		19.0				
Green Ext Time (p_c), s		2.9		4.0		4.1		2.7				
Intersection Summary												
HCM 2010 Ctrl Delay			20.6									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis
8: 4th & Tamalpais

Baseline Plus BioMarin Only Conditions

Timing Plan: PM Peak Hour

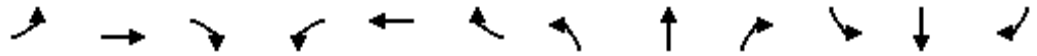


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↔			↗
Traffic Volume (vph)	0	370	380	65	0	55
Future Volume (vph)	0	370	380	65	0	55
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0	6.0			5.6
Lane Util. Factor		1.00	1.00			1.00
Frbp, ped/bikes		1.00	0.97			0.78
Flpb, ped/bikes		1.00	1.00			1.00
Frt		1.00	0.98			0.86
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		1588	1516			1074
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		1588	1516			1074
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	385	396	68	0	57
RTOR Reduction (vph)	0	0	7	0	0	48
Lane Group Flow (vph)	0	385	457	0	0	9
Confl. Peds. (#/hr)				59		78
Confl. Bikes (#/hr)				14		
Turn Type		NA	NA			Perm
Protected Phases		2 8	4 6			
Permitted Phases						8
Actuated Green, G (s)		55.1	56.1			12.3
Effective Green, g (s)		55.1	56.1			12.3
Actuated g/C Ratio		0.69	0.70			0.15
Clearance Time (s)						5.6
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)		1093	1063			165
v/s Ratio Prot		c0.24	c0.30			
v/s Ratio Perm						0.01
v/c Ratio		0.35	0.43			0.05
Uniform Delay, d1		5.1	5.1			28.9
Progression Factor		0.96	0.17			1.00
Incremental Delay, d2		0.2	0.2			0.1
Delay (s)		5.1	1.1			29.0
Level of Service		A	A			C
Approach Delay (s)		5.1	1.1		29.0	
Approach LOS		A	A		C	
Intersection Summary						
HCM 2000 Control Delay			4.5		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.47			
Actuated Cycle Length (s)			80.0		Sum of lost time (s)	17.6
Intersection Capacity Utilization			51.0%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
 9: Hetherton & 4th

Baseline Plus BioMarin Only Conditions

Timing Plan: PM Peak Hour





















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↖	↑						↑↑↑	↗
Traffic Volume (vph)	0	270	110	80	240	0	0	0	0	125	961	230
Future Volume (vph)	0	270	110	80	240	0	0	0	0	125	961	230
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	13	10	15	11	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Lane Util. Factor		1.00	1.00	1.00	1.00						0.91	1.00
Frbp, ped/bikes		1.00	0.93	1.00	1.00						1.00	0.92
Flpb, ped/bikes		1.00	1.00	0.97	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						0.99	1.00
Satd. Flow (prot)		1641	1173	1605	1535						4143	1102
Flt Permitted		1.00	1.00	0.52	1.00						0.99	1.00
Satd. Flow (perm)		1641	1173	874	1535						4143	1102
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	281	115	83	250	0	0	0	0	130	1001	240
RTOR Reduction (vph)	0	0	29	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	281	86	83	250	0	0	0	0	0	1131	240
Confl. Peds. (#/hr)			51	51		28			11	11		19
Confl. Bikes (#/hr)			10			16			1			1
Parking (#/hr)											2	2
Turn Type		NA	Perm	Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases			4	8								5
Actuated Green, G (s)		34.8	34.8	34.8	34.8						36.4	29.4
Effective Green, g (s)		34.8	34.8	34.8	34.8						36.4	29.4
Actuated g/C Ratio		0.43	0.43	0.43	0.43						0.45	0.37
Clearance Time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		713	510	380	667						1885	404
v/s Ratio Prot		c0.17			0.16							
v/s Ratio Perm			0.07	0.10							0.27	0.22
v/c Ratio		0.39	0.17	0.22	0.37						0.60	0.59
Uniform Delay, d1		15.4	13.8	14.1	15.3						16.3	20.5
Progression Factor		0.52	0.38	0.89	0.92						0.38	0.49
Incremental Delay, d2		1.6	0.7	1.2	1.5						1.1	4.9
Delay (s)		9.6	6.0	13.7	15.5						7.4	14.9
Level of Service		A	A	B	B						A	B
Approach Delay (s)		8.5			15.1			0.0			8.7	
Approach LOS		A			B			A			A	

Intersection Summary		
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.51	A
Actuated Cycle Length (s)	80.0	Sum of lost time (s)
Intersection Capacity Utilization	74.8%	10.8
Analysis Period (min)	15	ICU Level of Service
		D

c Critical Lane Group















HCM 2010 Signalized Intersection Summary
10: Irwin & 4th

Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	210	0	0	195	90	125	1313	160	0	0	0
Future Volume (veh/h)	175	210	0	0	195	90	125	1313	160	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.95	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1588	1588	0	0	1588	1620	1525	1588	1620			
Adj Flow Rate, veh/h	182	219	0	0	203	72	130	1368	147			
Adj No. of Lanes	1	1	0	0	1	0	1	3	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	234	552	0	0	333	118	795	2174	234			
Arrive On Green	0.11	0.11	0.00	0.00	0.11	0.11	0.18	0.18	0.18			
Sat Flow, veh/h	985	1588	0	0	959	340	1452	3971	427			
Grp Volume(v), veh/h	182	219	0	0	0	275	130	996	519			
Grp Sat Flow(s),veh/h/ln	985	1588	0	0	0	1299	1452	1445	1507			
Q Serve(g_s), s	11.7	10.2	0.0	0.0	0.0	16.1	6.0	25.5	25.5			
Cycle Q Clear(g_c), s	27.8	10.2	0.0	0.0	0.0	16.1	6.0	25.5	25.5			
Prop In Lane	1.00		0.00	0.00		0.26	1.00		0.28			
Lane Grp Cap(c), veh/h	234	552	0	0	0	451	795	1583	825			
V/C Ratio(X)	0.78	0.40	0.00	0.00	0.00	0.61	0.16	0.63	0.63			
Avail Cap(c_a), veh/h	234	552	0	0	0	451	795	1583	825			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	0.33	0.33	0.33	0.33	0.33			
Upstream Filter(I)	0.92	0.92	0.00	0.00	0.00	1.00	0.29	0.29	0.29			
Uniform Delay (d), s/veh	44.7	27.6	0.0	0.0	0.0	30.2	17.3	25.3	25.3			
Incr Delay (d2), s/veh	20.7	2.0	0.0	0.0	0.0	6.0	0.1	0.6	1.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.4	4.8	0.0	0.0	0.0	6.6	2.5	10.3	10.9			
LnGrp Delay(d),s/veh	65.4	29.6	0.0	0.0	0.0	36.3	17.4	25.8	26.3			
LnGrp LOS	E	C				D	B	C	C			
Approach Vol, veh/h		401			275			1645				
Approach Delay, s/veh		45.9			36.3			25.3				
Approach LOS		D			D			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		32.0		48.0		32.0						
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2						
Max Green Setting (Gmax), s		* 28		* 44		* 28						
Max Q Clear Time (g_c+I1), s		29.8		27.5		18.1						
Green Ext Time (p_c), s		0.0		7.9		0.8						
Intersection Summary												
HCM 2010 Ctrl Delay			30.2									
HCM 2010 LOS			C									
Notes												













HCM 2010 Signalized Intersection Summary
11: D & 3rd

Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	300	1495	0	0	0	0	0	280	50
Future Volume (veh/h)	0	0	0	300	1495	0	0	0	0	0	280	50
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.95
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.82
Adj Sat Flow, veh/h/ln				1530	1500	0				0	1500	1530
Adj Flow Rate, veh/h				312	1557	0				0	292	33
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				453	1997	0				0	626	70
Arrive On Green				0.21	0.21	0.00				0.00	0.27	0.27
Sat Flow, veh/h				621	3330	0				0	2415	261
Grp Volume(v), veh/h				675	1194	0				0	176	149
Grp Sat Flow(s),veh/h/ln				1345	1242	0				0	1425	1176
Q Serve(g_s), s				38.2	36.3	0.0				0.0	8.3	8.5
Cycle Q Clear(g_c), s				38.2	36.3	0.0				0.0	8.3	8.5
Prop In Lane				0.46		0.00				0.00		0.22
Lane Grp Cap(c), veh/h				903	1546	0				0	381	315
V/C Ratio(X)				0.75	0.77	0.00				0.00	0.46	0.47
Avail Cap(c_a), veh/h				903	1546	0				0	381	315
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				27.2	26.4	0.0				0.0	24.5	24.6
Incr Delay (d2), s/veh				5.6	3.8	0.0				0.0	4.0	5.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				15.7	13.3	0.0				0.0	3.7	3.2
LnGrp Delay(d),s/veh				32.8	30.2	0.0				0.0	28.5	29.6
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1869						325	
Approach Delay, s/veh					31.2						29.0	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		54.0		26.0								
Change Period (Y+Rc), s		* 4.2		4.6								
Max Green Setting (Gmax), s		* 50		21.4								
Max Q Clear Time (g_c+I1), s		40.2		10.5								
Green Ext Time (p_c), s		6.3		1.0								
Intersection Summary												
HCM 2010 Ctrl Delay				30.8								
HCM 2010 LOS				C								
Notes												













HCM 2010 Signalized Intersection Summary
12: C & 3rd

Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑		↑↑				
Traffic Volume (veh/h)	0	0	0	0	1665	150	140	310	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1665	150	140	310	0	0	0	0
Number				5	2	12	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.98	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1412	1412	1440	1412	0			
Adj Flow Rate, veh/h				0	1734	120	146	323	0			
Adj No. of Lanes				0	3	1	0	2	0			
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %				0	2	2	2	2	0			
Cap, veh/h				0	2351	717	266	507	0			
Arrive On Green				0.00	0.20	0.20	0.09	0.09	0.00			
Sat Flow, veh/h				0	3981	1175	683	1842	0			
Grp Volume(v), veh/h				0	1734	120	253	216	0			
Grp Sat Flow(s),veh/h/ln				0	1285	1175	1241	1220	0			
Q Serve(g_s), s				0.0	33.8	6.8	14.8	13.6	0.0			
Cycle Q Clear(g_c), s				0.0	33.8	6.8	15.8	13.6	0.0			
Prop In Lane				0.00		1.00	0.58		0.00			
Lane Grp Cap(c), veh/h				0	2351	717	425	348	0			
V/C Ratio(X)				0.00	0.74	0.17	0.60	0.62	0.00			
Avail Cap(c_a), veh/h				0	2351	717	425	348	0			
HCM Platoon Ratio				1.00	0.33	0.33	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	25.9	15.2	33.0	32.1	0.0			
Incr Delay (d2), s/veh				0.0	2.1	0.5	6.0	8.1	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	12.5	2.3	6.1	5.4	0.0			
LnGrp Delay(d),s/veh				0.0	28.1	15.7	39.0	40.2	0.0			
LnGrp LOS					C	B	D	D				
Approach Vol, veh/h					1854			469				
Approach Delay, s/veh					27.3			39.6				
Approach LOS					C			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		53.0		27.0								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 49		* 23								
Max Q Clear Time (g_c+I1), s		35.8		17.8								
Green Ext Time (p_c), s		8.2		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay				29.7								
HCM 2010 LOS				C								
Notes												

















HCM 2010 Signalized Intersection Summary
13: B & 3rd

Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑						↑↑	
Traffic Volume (veh/h)	0	0	0	180	1730	0	0	0	0	0	275	90
Future Volume (veh/h)	0	0	0	180	1730	0	0	0	0	0	275	90
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.86
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1440	1412	0				0	1412	1440
Adj Flow Rate, veh/h				188	1802	0				0	286	77
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				263	2124	0				0	499	129
Arrive On Green				0.21	0.21	0.00				0.00	0.26	0.26
Sat Flow, veh/h				325	3460	0				0	1988	496
Grp Volume(v), veh/h				733	1257	0				0	196	167
Grp Sat Flow(s),veh/h/ln				1331	1169	0				0	1341	1072
Q Serve(g_s), s				40.2	41.3	0.0				0.0	10.2	10.9
Cycle Q Clear(g_c), s				42.5	41.3	0.0				0.0	10.2	10.9
Prop In Lane				0.26		0.00				0.00		0.46
Lane Grp Cap(c), veh/h				901	1485	0				0	349	279
V/C Ratio(X)				0.81	0.85	0.00				0.00	0.56	0.60
Avail Cap(c_a), veh/h				901	1485	0				0	349	279
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				28.3	27.9	0.0				0.0	25.7	25.9
Incr Delay (d2), s/veh				7.9	6.1	0.0				0.0	6.4	9.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				17.7	14.7	0.0				0.0	4.4	3.9
LnGrp Delay(d),s/veh				36.2	34.0	0.0				0.0	32.1	35.1
LnGrp LOS				D	C						C	D
Approach Vol, veh/h					1990						363	
Approach Delay, s/veh					34.8						33.5	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		55.0		25.0								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 51		* 21								
Max Q Clear Time (g_c+I1), s		44.5		12.9								
Green Ext Time (p_c), s		4.7		1.0								
Intersection Summary												
HCM 2010 Ctrl Delay				34.6								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary
14: A & 3rd

Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	70	1580	90	240	155	0	0	170	50
Future Volume (veh/h)	0	0	0	70	1580	90	240	155	0	0	170	50
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.91	0.96		1.00	1.00		0.92
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1800	1765	1800	1853	1853	0	0	1853	1890
Adj Flow Rate, veh/h				73	1646	87	250	161	0	0	177	38
Adj No. of Lanes				0	3	0	1	1	0	0	1	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				105	2506	137	299	649	0	0	299	64
Arrive On Green				0.18	0.18	0.18	0.10	0.58	0.00	0.00	0.23	0.23
Sat Flow, veh/h				192	4609	251	1765	1853	0	0	1294	278
Grp Volume(v), veh/h				666	554	586	250	161	0	0	0	215
Grp Sat Flow(s),veh/h/ln				1755	1606	1692	1765	1853	0	0	0	1571
Q Serve(g_s), s				28.5	25.6	25.6	2.1	3.4	0.0	0.0	0.0	9.7
Cycle Q Clear(g_c), s				28.5	25.6	25.6	2.1	3.4	0.0	0.0	0.0	9.7
Prop In Lane				0.11		0.15	1.00		0.00	0.00		0.18
Lane Grp Cap(c), veh/h				954	873	920	299	649	0	0	0	363
V/C Ratio(X)				0.70	0.63	0.64	0.84	0.25	0.00	0.00	0.00	0.59
Avail Cap(c_a), veh/h				954	873	920	299	649	0	0	0	363
HCM Platoon Ratio				0.33	0.33	0.33	1.67	1.67	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				26.7	25.5	25.5	32.4	11.5	0.0	0.0	0.0	27.4
Incr Delay (d2), s/veh				4.2	3.5	3.4	23.3	0.9	0.0	0.0	0.0	6.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				14.9	12.2	12.9	7.0	1.9	0.0	0.0	0.0	4.9
LnGrp Delay(d),s/veh				30.9	29.0	28.9	55.7	12.4	0.0	0.0	0.0	34.3
LnGrp LOS				C	C	C	E	B				C
Approach Vol, veh/h					1806			411			215	
Approach Delay, s/veh					29.6			38.7			34.3	
Approach LOS					C			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			9.0	23.0		48.0		32.0				
Change Period (Y+Rc), s			4.0	4.5		4.5		4.0				
Max Green Setting (Gmax), s			5.0	18.5		43.5		28.0				
Max Q Clear Time (g_c+I1), s			4.1	11.7		30.5		5.4				
Green Ext Time (p_c), s			0.2	0.8		10.9		1.2				
Intersection Summary												
HCM 2010 Ctrl Delay				31.6								
HCM 2010 LOS				C								

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

BioMarin
Baseline Plus BioMarin Only Conditions
PM Peak Hour

Intersection 15 Brooks St/3rd St Side-street Stop
















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	41	37	90.8%	10.9	3.2	B
	Through	5	7	130.6%	12.6	12.2	B
	Right Turn						
	Subtotal	46	44	95.2%	12.4	3.4	B
SB	Left Turn						
	Through	10	12	115.2%	25.1	12.5	D
	Right Turn	5	7	138.2%	15.5	13.6	C
	Subtotal	15	18	122.9%	20.7	7.1	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	65	70	107.5%	3.0	0.3	A
	Through	1,699	1,687	99.3%	2.1	0.2	A
	Right Turn	5	4	76.8%	1.7	0.2	A
	Subtotal	1,769	1,760	99.5%	2.2	0.2	A
Total		1,830	1,822	99.6%	2.6	0.4	A

Intersection 16 Lindaro St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	119	127	106.8%	25.8	3.2	C
	Through	20	26	128.6%	28.0	4.4	C
	Right Turn						
	Subtotal	139	153	110.0%	26.2	2.9	C
SB	Left Turn						
	Through	50	52	103.7%	22.1	5.0	C
	Right Turn	10	13	126.7%	14.1	9.2	B
	Subtotal	60	65	107.5%	20.6	4.9	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	232	239	103.0%	12.4	2.0	B
	Through	1,727	1,694	98.1%	9.4	1.5	A
	Right Turn	40	39	97.9%	8.1	1.6	A
	Subtotal	1,999	1,972	98.6%	9.7	1.5	A
Total		2,198	2,189	99.6%	11.2	1.4	B



















HCM 2010 Signalized Intersection Summary
17: Lincoln & 3rd

Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	100	1699	130	40	330	0	0	265	150
Future Volume (veh/h)	0	0	0	100	1699	130	40	330	0	0	265	150
Number				1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	0.97		1.00	1.00		0.83
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1620	1588	1620	1620	1588	0	0	1525	1555
Adj Flow Rate, veh/h				104	1770	125	42	344	0	0	276	149
Adj No. of Lanes				0	3	0	0	2	0	0	2	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				126	2285	166	100	738	0	0	552	279
Arrive On Green				0.19	0.19	0.19	0.64	0.64	0.00	0.00	0.11	0.11
Sat Flow, veh/h				222	4017	292	142	2387	0	0	1807	874
Grp Volume(v), veh/h				738	615	646	193	193	0	0	228	197
Grp Sat Flow(s),veh/h/ln				1577	1445	1509	1084	1373	0	0	1448	1157
Q Serve(g_s), s				36.0	32.2	32.4	2.5	5.7	0.0	0.0	11.9	12.9
Cycle Q Clear(g_c), s				36.0	32.2	32.4	15.4	5.7	0.0	0.0	11.9	12.9
Prop In Lane				0.14		0.19	0.22		0.00	0.00		0.76
Lane Grp Cap(c), veh/h				897	822	858	400	438	0	0	462	369
V/C Ratio(X)				0.82	0.75	0.75	0.48	0.44	0.00	0.00	0.49	0.53
Avail Cap(c_a), veh/h				897	822	858	400	438	0	0	462	369
HCM Platoon Ratio				0.33	0.33	0.33	2.00	2.00	1.00	1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				28.6	27.1	27.2	11.4	10.9	0.0	0.0	29.7	30.2
Incr Delay (d2), s/veh				8.4	6.2	6.1	4.1	3.2	0.0	0.0	3.7	5.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				17.8	14.3	15.0	2.4	2.4	0.0	0.0	5.3	4.7
LnGrp Delay(d),s/veh				37.0	33.2	33.2	15.5	14.1	0.0	0.0	33.4	35.6
LnGrp LOS				D	C	C	B	B			C	D
Approach Vol, veh/h					1999			386			425	
Approach Delay, s/veh					34.6			14.8			34.5	
Approach LOS					C			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				30.0		50.0		30.0				
Change Period (Y+Rc), s				4.5		4.5		4.5				
Max Green Setting (Gmax), s				25.5		45.5		25.5				
Max Q Clear Time (g_c+I1), s				17.4		38.0		14.9				
Green Ext Time (p_c), s				1.1		5.4		1.5				
Intersection Summary												
HCM 2010 Ctrl Delay				31.9								
HCM 2010 LOS				C								


















HCM Signalized Intersection Capacity Analysis
18: Tamalpais & 3rd

Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  							
Traffic Volume (vph)	0	0	0	300	1774	30	110	50	0	0	30	30
Future Volume (vph)	0	0	0	300	1774	30	110	50	0	0	30	30
Ideal Flow (vphpl)	1800	1800	1800	1600	1600	1600	1600	1600	1800	1800	1600	1600
Lane Width	12	12	12	12	12	12	11	12	12	12	12	12
Total Lost time (s)					11.6		7.6	7.6			7.6	
Lane Util. Factor					0.91		1.00	1.00			1.00	
Frbp, ped/bikes					1.00		1.00	1.00			0.97	
Flpb, ped/bikes					0.97		0.96	1.00			1.00	
Frt					1.00		1.00	1.00			0.93	
Flt Protected					0.99		0.95	1.00			1.00	
Satd. Flow (prot)					3682		1100	1249			1128	
Flt Permitted					0.99		0.72	1.00			1.00	
Satd. Flow (perm)					3682		830	1249			1128	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	312	1848	31	115	52	0	0	31	31
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	8	0
Lane Group Flow (vph)	0	0	0	0	2190	0	115	52	0	0	54	0
Confl. Peds. (#/hr)			106	106		44	30		69			30
Confl. Bikes (#/hr)						2			3			8
Parking (#/hr)							3	3			3	3
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					6			4			8	
Permitted Phases				6			4					
Actuated Green, G (s)					51.4		19.4	19.4			19.4	
Effective Green, g (s)					51.4		19.4	19.4			19.4	
Actuated g/C Ratio					0.57		0.22	0.22			0.22	
Clearance Time (s)					11.6		7.6	7.6			7.6	
Lane Grp Cap (vph)					2102		178	269			243	
v/s Ratio Prot								0.04			0.05	
v/s Ratio Perm					0.59		c0.14					
v/c Ratio					1.04		0.65	0.19			0.22	
Uniform Delay, d1					19.3		32.2	28.9			29.1	
Progression Factor					1.00		1.00	1.00			1.00	
Incremental Delay, d2					31.6		16.7	1.6			2.1	
Delay (s)					50.9		48.9	30.5			31.2	
Level of Service					D		D	C			C	
Approach Delay (s)		0.0			50.9			43.2			31.2	
Approach LOS		A			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			49.9		HCM 2000 Level of Service				D			
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)				19.2			
Intersection Capacity Utilization			157.9%		ICU Level of Service				H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
19: Hetherton & 3rd













Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	480	1593	0	0	0	0	0	665	486
Future Volume (veh/h)	0	0	0	480	1593	0	0	0	0	0	665	486
Number				1	6	16				3	8	18
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.85
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1560	1588	0				0	1588	1500
Adj Flow Rate, veh/h				500	1659	0				0	693	498
Adj No. of Lanes				1	3	0				0	3	1
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				740	2085	0				0	1951	489
Arrive On Green				0.14	0.14	0.00				0.00	0.15	0.15
Sat Flow, veh/h				1486	4765	0				0	4479	1088
Grp Volume(v), veh/h				500	1659	0				0	693	498
Grp Sat Flow(s),veh/h/ln				1486	1588	0				0	1445	1088
Q Serve(g_s), s				25.9	26.9	0.0				0.0	11.5	36.0
Cycle Q Clear(g_c), s				25.9	26.9	0.0				0.0	11.5	36.0
Prop In Lane				1.00		0.00				0.00		1.00
Lane Grp Cap(c), veh/h				740	2085	0				0	1951	489
V/C Ratio(X)				0.68	0.80	0.00				0.00	0.36	1.02
Avail Cap(c_a), veh/h				740	2085	0				0	1951	489
HCM Platoon Ratio				0.33	0.33	1.00				1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				30.3	30.8	0.0				0.0	23.6	34.1
Incr Delay (d2), s/veh				4.9	3.3	0.0				0.0	0.5	45.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.7	12.5	0.0				0.0	4.7	17.0
LnGrp Delay(d),s/veh				35.2	34.0	0.0				0.0	24.1	79.2
LnGrp LOS				D	C						C	F
Approach Vol, veh/h					2159						1191	
Approach Delay, s/veh					34.3						47.2	
Approach LOS					C						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs						6		8				
Phs Duration (G+Y+Rc), s						39.0		41.0				
Change Period (Y+Rc), s						4.0		5.0				
Max Green Setting (Gmax), s						35.0		36.0				
Max Q Clear Time (g_c+I1), s						28.9		38.0				
Green Ext Time (p_c), s						4.8		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay					38.9							
HCM 2010 LOS					D							
Notes												
User approved volume balancing among the lanes for turning movement.												

User approved ignoring U-Turning movement.













HCM 2010 Signalized Intersection Summary
20: Irwin & 3rd/3rd St

Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑	↑	↑↑↑				
Traffic Volume (veh/h)	0	0	0	0	1150	195	918	1403	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1150	195	918	1403	0	0	0	0
Number				1	6	16	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.94	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1500	1500	1398	1398	0			
Adj Flow Rate, veh/h				0	1198	189	1053	1326	0			
Adj No. of Lanes				0	3	1	2	2	0			
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %				0	2	2	3	3	0			
Cap, veh/h				0	1510	441	1381	1450	0			
Arrive On Green				0.00	0.37	0.37	0.17	0.17	0.00			
Sat Flow, veh/h				0	4230	1195	2663	2796	0			
Grp Volume(v), veh/h				0	1198	189	1053	1326	0			
Grp Sat Flow(s),veh/h/ln				0	1365	1195	1331	1398	0			
Q Serve(g_s), s				0.0	20.9	9.5	30.2	37.3	0.0			
Cycle Q Clear(g_c), s				0.0	20.9	9.5	30.2	37.3	0.0			
Prop In Lane				0.00		1.00	1.00		0.00			
Lane Grp Cap(c), veh/h				0	1510	441	1381	1450	0			
V/C Ratio(X)				0.00	0.79	0.43	0.76	0.91	0.00			
Avail Cap(c_a), veh/h				0	1510	441	1381	1450	0			
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	22.5	18.9	28.5	31.4	0.0			
Incr Delay (d2), s/veh				0.0	4.4	3.0	4.0	10.4	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	8.4	3.5	11.9	16.5	0.0			
LnGrp Delay(d),s/veh				0.0	26.9	22.0	32.5	41.8	0.0			
LnGrp LOS					C	C	C	D				
Approach Vol, veh/h					1387			2379				
Approach Delay, s/veh					26.2			37.7				
Approach LOS					C			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				46.0		34.0						
Change Period (Y+Rc), s				4.5		4.5						
Max Green Setting (Gmax), s				41.5		29.5						
Max Q Clear Time (g_c+I1), s				39.3		22.9						
Green Ext Time (p_c), s				2.0		3.9						
Intersection Summary												
HCM 2010 Ctrl Delay				33.5								
HCM 2010 LOS				C								
Notes												













HCM 2010 Signalized Intersection Summary
21: D & 2nd

Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑		↑	↑	
Traffic Volume (veh/h)	0	1526	100	0	0	0	0	0	400	170	430	0
Future Volume (veh/h)	0	1526	100	0	0	0	0	0	400	170	430	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1676	1710				0	1588	1620	1765	1765	0
Adj Flow Rate, veh/h	0	1590	95				0	0	402	177	448	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	0	0	0				0	0	1145	992	1526	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.86	0.29	0.29	0.00
Sat Flow, veh/h		0					0	0	1324	969	1765	0
Grp Volume(v), veh/h		0.0					0	0	402	177	448	0
Grp Sat Flow(s),veh/h/ln							0	0	1324	969	1765	0
Q Serve(g_s), s							0.0	0.0	2.0	4.9	6.7	0.0
Cycle Q Clear(g_c), s							0.0	0.0	2.0	6.9	6.7	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	1145	992	1526	0
V/C Ratio(X)							0.00	0.00	0.35	0.18	0.29	0.00
Avail Cap(c_a), veh/h							0	0	1145	992	1526	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh							0.0	0.0	0.4	4.9	4.0	0.0
Incr Delay (d2), s/veh							0.0	0.0	0.8	0.4	0.5	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	0.9	1.4	3.6	0.0
LnGrp Delay(d),s/veh							0.0	0.0	1.3	5.3	4.5	0.0
LnGrp LOS									A	A	A	
Approach Vol, veh/h								402			625	
Approach Delay, s/veh								1.3			4.7	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				34.0				34.0				
Change Period (Y+Rc), s				4.6				4.6				
Max Green Setting (Gmax), s				29.4				29.4				
Max Q Clear Time (g_c+I1), s				8.9				4.0				
Green Ext Time (p_c), s				1.8				1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			3.4									
HCM 2010 LOS			A									













HCM 2010 Signalized Intersection Summary
22: C & 2nd

Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑↑				
Traffic Volume (veh/h)	185	1916	0	0	0	0	0	245	120	0	0	0
Future Volume (veh/h)	185	1916	0	0	0	0	0	245	120	0	0	0
Number	1	6	16				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1440	1500	0				0	1500	1440			
Adj Flow Rate, veh/h	193	1996	0				0	255	120			
Adj No. of Lanes	0	3	0				0	2	0			
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0				0	2	2			
Cap, veh/h	251	2157	0				0	626	284			
Arrive On Green	0.19	0.19	0.00				0.00	0.32	0.32			
Sat Flow, veh/h	344	3801	0				0	1940	881			
Grp Volume(v), veh/h	763	1426	0				0	195	180			
Grp Sat Flow(s),veh/h/ln	1414	1365	0				0	1500	1322			
Q Serve(g_s), s	40.9	41.0	0.0				0.0	8.1	8.5			
Cycle Q Clear(g_c), s	42.7	41.0	0.0				0.0	8.1	8.5			
Prop In Lane	0.25		0.00				0.00		0.67			
Lane Grp Cap(c), veh/h	859	1549	0				0	484	426			
V/C Ratio(X)	0.89	0.92	0.00				0.00	0.40	0.42			
Avail Cap(c_a), veh/h	859	1549	0				0	484	426			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	31.3	30.7	0.0				0.0	21.1	21.3			
Incr Delay (d2), s/veh	13.2	10.4	0.0				0.0	2.5	3.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	19.9	17.8	0.0				0.0	3.7	3.5			
LnGrp Delay(d),s/veh	44.5	41.2	0.0				0.0	23.6	24.3			
LnGrp LOS	D	D						C	C			
Approach Vol, veh/h		2189						375				
Approach Delay, s/veh		42.3						23.9				
Approach LOS		D						C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				30.0		50.0						
Change Period (Y+Rc), s				* 4.2		4.6						
Max Green Setting (Gmax), s				* 26		45.4						
Max Q Clear Time (g_c+I1), s				10.5		44.7						
Green Ext Time (p_c), s				2.8		0.7						
Intersection Summary												
HCM 2010 Ctrl Delay			39.6									
HCM 2010 LOS			D									
Notes												

















HCM 2010 Signalized Intersection Summary
23: B & 2nd

Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑		↑	↑	
Traffic Volume (veh/h)	0	1961	80	0	0	0	0	0	230	200	270	0
Future Volume (veh/h)	0	1961	80	0	0	0	0	0	230	200	270	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.95	0.98		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1500	1382				0	1588	1591	1560	1500	0
Adj Flow Rate, veh/h	0	2043	78				0	0	224	208	281	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	0	0	0				0	0	1101	1057	1282	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.85	0.28	0.28	0.00
Sat Flow, veh/h		0					0	0	1288	1001	1500	0
Grp Volume(v), veh/h		0.0					0	0	224	208	281	0
Grp Sat Flow(s),veh/h/ln							0	0	1288	1001	1500	0
Q Serve(g_s), s							0.0	0.0	0.9	5.0	4.4	0.0
Cycle Q Clear(g_c), s							0.0	0.0	0.9	6.0	4.4	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	1101	1057	1282	0
V/C Ratio(X)							0.00	0.00	0.20	0.20	0.22	0.00
Avail Cap(c_a), veh/h							0	0	1101	1057	1282	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh							0.0	0.0	0.4	4.1	3.2	0.0
Incr Delay (d2), s/veh							0.0	0.0	0.4	0.4	0.4	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	0.4	1.5	2.0	0.0
LnGrp Delay(d),s/veh							0.0	0.0	0.8	4.5	3.6	0.0
LnGrp LOS									A	A	A	
Approach Vol, veh/h								224			489	
Approach Delay, s/veh								0.8			4.0	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				31.0				31.0				
Change Period (Y+Rc), s				4.5				4.5				
Max Green Setting (Gmax), s				26.5				26.5				
Max Q Clear Time (g_c+I1), s				8.0				2.9				
Green Ext Time (p_c), s				1.4				0.6				
Intersection Summary												
HCM 2010 Ctrl Delay			3.0									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary
24: A & 2nd

Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	2116	175	0	0	0	0	305	30	110	130	0
Future Volume (veh/h)	100	2116	175	0	0	0	0	305	30	110	130	0
Number	5	2	12				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95				1.00		0.92	0.96		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1765	1800				0	1676	1710	1676	1744	0
Adj Flow Rate, veh/h	104	2204	171				0	318	22	115	135	0
Adj No. of Lanes	0	3	0				0	2	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	116	2597	205				0	629	43	255	543	0
Arrive On Green	0.19	0.19	0.19				0.00	0.21	0.21	0.03	0.21	0.00
Sat Flow, veh/h	200	4488	355				0	3088	206	1597	1744	0
Grp Volume(v), veh/h	911	757	811				0	167	173	115	135	0
Grp Sat Flow(s),veh/h/ln	1755	1606	1682				0	1593	1618	1597	1744	0
Q Serve(g_s), s	40.7	36.2	37.2				0.0	7.4	7.6	0.0	5.2	0.0
Cycle Q Clear(g_c), s	40.7	36.2	37.2				0.0	7.4	7.6	0.0	5.2	0.0
Prop In Lane	0.11		0.21				0.00		0.13	1.00		0.00
Lane Grp Cap(c), veh/h	1015	929	973				0	334	339	255	543	0
V/C Ratio(X)	0.90	0.81	0.83				0.00	0.50	0.51	0.45	0.25	0.00
Avail Cap(c_a), veh/h	1015	929	973				0	334	339	255	543	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.1	28.3	28.7				0.0	28.0	28.1	34.1	23.9	0.0
Incr Delay (d2), s/veh	12.3	7.8	8.3				0.0	5.3	5.4	5.7	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	23.2	18.1	19.6				0.0	3.7	3.9	2.9	2.7	0.0
LnGrp Delay(d),s/veh	42.4	36.1	37.1				0.0	33.3	33.4	39.8	25.0	0.0
LnGrp LOS	D	D	D					C	C	D	C	
Approach Vol, veh/h		2479						340			250	
Approach Delay, s/veh		38.7						33.4			31.8	
Approach LOS		D						C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		51.0		29.2			8.2	21.0				
Change Period (Y+Rc), s		4.6		* 4.2			* 4.2	* 4.2				
Max Green Setting (Gmax), s		46.4		* 25			* 4	* 17				
Max Q Clear Time (g_c+I1), s		42.7		7.2			2.0	9.6				
Green Ext Time (p_c), s		3.7		0.9			0.1	1.5				
Intersection Summary												
HCM 2010 Ctrl Delay			37.6									
HCM 2010 LOS			D									
Notes												

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

BioMarin
Baseline Plus BioMarin Only Conditions
PM Peak Hour

Intersection 25 Brooks St/2nd St Side-street Stop


















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	89	97	108.7%	31.7	5.8	D
	Through						
	Right Turn						
	Subtotal	89	97	108.7%	31.7	5.8	D
EB	Left Turn	45	43	96.4%	3.1	0.4	A
	Through	2,246	2,286	101.8%	2.8	0.2	A
	Right Turn						
	Subtotal	2,291	2,330	101.7%	2.8	0.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,380	2,426	102.0%	4.0	0.6	A

Intersection 26 Lindaro St/2nd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	89	93	104.8%	18.9	4.5	B
	Right Turn	413	401	97.2%	26.7	10.4	C
	Subtotal	502	495	98.5%	25.1	8.5	C
SB	Left Turn	107	106	98.7%	26.2	3.6	C
	Through	180	184	102.4%	18.5	2.7	B
	Right Turn						
	Subtotal	287	290	101.0%	21.2	1.6	C
EB	Left Turn	50	56	112.9%	17.1	4.4	B
	Through	2,213	2,223	100.4%	15.9	1.5	B
	Right Turn	42	40	94.2%	9.6	2.6	A
	Subtotal	2,305	2,319	100.6%	15.8	1.5	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,094	3,103	100.3%	17.9	1.9	B



















HCM 2010 Signalized Intersection Summary
27: Lincoln & 2nd

Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	2402	51	0	0	0	0	200	130	130	180	0
Future Volume (veh/h)	220	2402	51	0	0	0	0	200	130	130	180	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1412	1412				0	1412	1412	1382	1355	0
Adj Flow Rate, veh/h	229	2502	31				0	208	125	135	188	0
Adj No. of Lanes	0	4	1				0	1	1	0	2	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	216	2541	642				0	491	404	257	439	0
Arrive On Green	0.18	0.18	0.18				0.00	0.35	0.35	0.69	0.69	0.00
Sat Flow, veh/h	394	4640	1172				0	1412	1162	496	1324	0
Grp Volume(v), veh/h	809	1922	31				0	208	125	156	167	0
Grp Sat Flow(s),veh/h/ln	1392	1214	1172				0	1412	1162	587	1172	0
Q Serve(g_s), s	43.8	41.9	1.7				0.0	9.0	6.3	11.6	4.9	0.0
Cycle Q Clear(g_c), s	43.8	41.9	1.7				0.0	9.0	6.3	20.6	4.9	0.0
Prop In Lane	0.28		1.00				0.00		1.00	0.87		0.00
Lane Grp Cap(c), veh/h	762	1994	642				0	491	404	288	407	0
V/C Ratio(X)	1.06	0.96	0.05				0.00	0.42	0.31	0.54	0.41	0.00
Avail Cap(c_a), veh/h	762	1994	642				0	491	404	288	407	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.8	32.0	15.5				0.0	20.0	19.1	14.3	8.7	0.0
Incr Delay (d2), s/veh	50.2	13.2	0.1				0.0	2.7	2.0	7.1	3.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	27.5	16.5	0.6				0.0	3.9	2.2	3.3	1.8	0.0
LnGrp Delay(d),s/veh	83.0	45.2	15.7				0.0	22.6	21.1	21.4	11.8	0.0
LnGrp LOS	F	D	B					C	C	C	B	
Approach Vol, veh/h		2762						333			323	
Approach Delay, s/veh		56.0						22.1			16.4	
Approach LOS		E						C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		48.0		32.0				32.0				
Change Period (Y+Rc), s		* 4.2		* 4.2				* 4.2				
Max Green Setting (Gmax), s		* 44		* 28				* 28				
Max Q Clear Time (g_c+I1), s		45.8		11.0				22.6				
Green Ext Time (p_c), s		0.0		1.3				0.7				
Intersection Summary												
HCM 2010 Ctrl Delay			48.9									
HCM 2010 LOS			D									
Notes												

















HCM 2010 Signalized Intersection Summary
28: Francisco W./Tamalpais & 2nd

Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	2512	120	0	0	0	0	140	340	85	235	0
Future Volume (veh/h)	30	2512	120	0	0	0	0	140	340	85	235	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1412	1412				0	1412	1468	1412	1412	0
Adj Flow Rate, veh/h	31	2617	78				0	146	319	89	245	0
Adj No. of Lanes	0	4	1				0	1	1	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	30	2740	614				0	408	351	243	408	0
Arrive On Green	0.18	0.18	0.18				0.00	0.29	0.29	0.58	0.58	0.00
Sat Flow, veh/h	55	4996	1119				0	1412	1216	738	1412	0
Grp Volume(v), veh/h	790	1858	78				0	146	319	89	245	0
Grp Sat Flow(s),veh/h/ln	1409	1214	1119				0	1412	1216	738	1412	0
Q Serve(g_s), s	43.9	40.2	4.7				0.0	6.6	20.2	7.4	9.0	0.0
Cycle Q Clear(g_c), s	43.9	40.2	4.7				0.0	6.6	20.2	14.0	9.0	0.0
Prop In Lane	0.04		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	773	1998	614				0	408	351	243	408	0
V/C Ratio(X)	1.02	0.93	0.13				0.00	0.36	0.91	0.37	0.60	0.00
Avail Cap(c_a), veh/h	773	1998	614				0	468	403	274	468	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	0.09	0.09	0.09				0.00	1.00	1.00	0.97	0.97	0.00
Uniform Delay (d), s/veh	32.8	31.2	16.7				0.0	22.6	27.4	17.5	13.9	0.0
Incr Delay (d2), s/veh	16.1	1.0	0.0				0.0	0.5	22.1	0.9	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.6	13.7	1.5				0.0	2.6	8.9	1.5	3.6	0.0
LnGrp Delay(d),s/veh	48.8	32.3	16.7				0.0	23.1	49.5	18.4	15.5	0.0
LnGrp LOS	F	C	B					C	D	B	B	
Approach Vol, veh/h		2726						465			334	
Approach Delay, s/veh		36.6						41.2			16.3	
Approach LOS		D						D			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		50.4		29.6				29.6				
Change Period (Y+Rc), s		6.5		6.5				6.5				
Max Green Setting (Gmax), s		40.5		26.5				26.5				
Max Q Clear Time (g_c+I1), s		45.9		22.2				16.0				
Green Ext Time (p_c), s		0.0		0.9				1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			35.3									
HCM 2010 LOS			D									

















HCM 2010 Signalized Intersection Summary
 29: 101 SBO on Hetherton/Hetherton & 2nd/2nd St

Baseline Plus BioMarin Only Conditions
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1848	1084	0	0	0	0	0	0	365	780	0
Future Volume (veh/h)	0	1848	1084	0	0	0	0	0	0	365	780	0
Number	5	2	12							7	4	14
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1500	1500							1500	1500	0
Adj Flow Rate, veh/h	0	1907	1072							380	812	0
Adj No. of Lanes	0	3	2							1	2	0
Peak Hour Factor	0.96	0.96	0.96							0.96	0.96	0.96
Percent Heavy Veh, %	0	2	2							2	2	0
Cap, veh/h	0	2268	1285							476	1000	0
Arrive On Green	0.00	0.17	0.17							0.11	0.11	0.00
Sat Flow, veh/h	0	4500	2550							1429	3000	0
Grp Volume(v), veh/h	0	1907	1072							380	812	0
Grp Sat Flow(s),veh/h/ln	0	1500	1275							1429	1500	0
Q Serve(g_s), s	0.0	32.9	32.6							20.8	21.2	0.0
Cycle Q Clear(g_c), s	0.0	32.9	32.6							20.8	21.2	0.0
Prop In Lane	0.00		1.00							1.00		0.00
Lane Grp Cap(c), veh/h	0	2268	1285							476	1000	0
V/C Ratio(X)	0.00	0.84	0.83							0.80	0.81	0.00
Avail Cap(c_a), veh/h	0	2268	1285							545	1144	0
HCM Platoon Ratio	1.00	0.33	0.33							0.33	0.33	1.00
Upstream Filter(I)	0.00	0.09	0.09							0.88	0.88	0.00
Uniform Delay (d), s/veh	0.0	30.2	30.1							33.0	33.1	0.0
Incr Delay (d2), s/veh	0.0	0.4	0.6							6.5	3.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.7	11.6							9.1	9.3	0.0
LnGrp Delay(d),s/veh	0.0	30.6	30.7							39.4	36.7	0.0
LnGrp LOS		C	C							D	D	
Approach Vol, veh/h		2979									1192	
Approach Delay, s/veh		30.7									37.6	
Approach LOS		C									D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		48.8		31.2								
Change Period (Y+Rc), s		8.5		4.5								
Max Green Setting (Gmax), s		36.5		30.5								
Max Q Clear Time (g_c+I1), s		34.9		23.2								
Green Ext Time (p_c), s		1.6		3.5								
Intersection Summary												
HCM 2010 Ctrl Delay			32.6									
HCM 2010 LOS			C									
Notes												





















HCM 2010 Signalized Intersection Summary
30: Irwin & 2nd St

Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	953	1310	0	0	0	0	0	1388	560	0	0	0
Future Volume (veh/h)	953	1310	0	0	0	0	0	1388	560	0	0	0
Number	5	2	12				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.94			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1468	1500	0				0	1412	1412			
Adj Flow Rate, veh/h	1030	1314	0				0	1446	571			
Adj No. of Lanes	2	2	0				0	3	1			
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0				0	2	2			
Cap, veh/h	1501	1418	0				0	1580	464			
Arrive On Green	0.16	0.16	0.00				0.00	0.41	0.41			
Sat Flow, veh/h	2797	3000	0				0	3981	1132			
Grp Volume(v), veh/h	1030	1314	0				0	1446	571			
Grp Sat Flow(s),veh/h/ln	1398	1500	0				0	1285	1132			
Q Serve(g_s), s	28.3	34.6	0.0				0.0	28.3	32.8			
Cycle Q Clear(g_c), s	28.3	34.6	0.0				0.0	28.3	32.8			
Prop In Lane	1.00		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	1501	1418	0				0	1580	464			
V/C Ratio(X)	0.69	0.93	0.00				0.00	0.92	1.23			
Avail Cap(c_a), veh/h	1501	1418	0				0	1580	464			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	29.8	32.4	0.0				0.0	22.3	23.6			
Incr Delay (d2), s/veh	2.6	11.8	0.0				0.0	9.8	121.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	11.5	16.7	0.0				0.0	11.3	25.8			
LnGrp Delay(d),s/veh	32.3	44.3	0.0				0.0	32.1	145.1			
LnGrp LOS	C	D						C	F			
Approach Vol, veh/h		2344						2017				
Approach Delay, s/veh		39.0						64.1				
Approach LOS		D						E				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		42.0		38.0								
Change Period (Y+Rc), s		* 4.2		* 5.2								
Max Green Setting (Gmax), s		* 38		* 33								
Max Q Clear Time (g_c+I1), s		36.6		34.8								
Green Ext Time (p_c), s		1.2		0.0								
Intersection Summary												
HCM 2010 Ctrl Delay			50.6									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary
31: Lindaro & Andersen

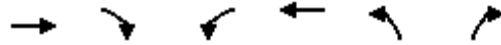
Baseline Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	280	40	70	280	51	60	221	170	102	139	30
Future Volume (veh/h)	20	280	40	70	280	51	60	221	170	102	139	30
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.96	1.00		0.93
Parking Bus, Adj	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 Sat Flow, veh/h/ln	2039	2039	2000	1961	1961	2000	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	21	292	35	73	292	46	62	230	145	106	145	23
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	57	388	47	154	446	70	268	302	190	222	406	64
Arrive On Green	0.03	0.22	0.22	0.08	0.27	0.27	0.15	0.29	0.29	0.12	0.26	0.26
Sat Flow, veh/h	1942	1778	213	1867	1644	259	1774	1049	662	1774	1551	246
Grp Volume(v), veh/h	21	0	327	73	0	338	62	0	375	106	0	168
Grp Sat Flow(s),veh/h/ln	1942	0	1991	1867	0	1903	1774	0	1711	1774	0	1796
Q Serve(g_s), s	0.6	0.0	9.2	2.2	0.0	9.4	1.8	0.0	11.9	3.3	0.0	4.5
Cycle Q Clear(g_c), s	0.6	0.0	9.2	2.2	0.0	9.4	1.8	0.0	11.9	3.3	0.0	4.5
Prop In Lane	1.00		0.11	1.00		0.14	1.00		0.39	1.00		0.14
Lane Grp Cap(c), veh/h	57	0	434	154	0	516	268	0	492	222	0	470
V/C Ratio(X)	0.37	0.00	0.75	0.47	0.00	0.66	0.23	0.00	0.76	0.48	0.00	0.36
Avail Cap(c_a), veh/h	261	0	831	313	0	858	298	0	660	298	0	693
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.4	0.0	21.8	26.1	0.0	19.3	22.3	0.0	19.4	24.3	0.0	17.9
Incr Delay (d2), s/veh	1.4	0.0	2.7	0.8	0.0	1.4	0.2	0.0	3.6	0.6	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	5.3	1.2	0.0	5.1	0.9	0.0	6.1	1.7	0.0	2.3
LnGrp Delay(d),s/veh	29.8	0.0	24.5	27.0	0.0	20.7	22.4	0.0	23.0	24.9	0.0	18.4
LnGrp LOS	C		C	C		C	C		C	C		B
Approach Vol, veh/h		348			411			437			274	
Approach Delay, s/veh		24.8			21.8			22.9			20.9	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	17.9	13.0	19.8	5.8	21.1	11.4	21.4				
Change Period (Y+Rc), s	4.0	4.9	4.0	* 4.2	4.0	4.9	4.0	* 4.2				
Max Green Setting (Gmax), s	10.0	24.9	10.0	* 23	8.0	26.9	10.0	* 23				
Max Q Clear Time (g_c+I1), s	4.2	11.2	3.8	6.5	2.6	11.4	5.3	13.9				
Green Ext Time (p_c), s	0.0	1.1	0.0	0.5	0.0	1.2	0.1	1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			22.7									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis
 32: Tamalpais & Mission

Baseline Plus BioMarin Only Conditions

Timing Plan: PM Peak Hour



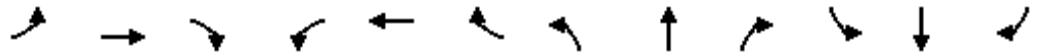
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	
Traffic Volume (vph)	490	50	0	635	10	25
Future Volume (vph)	490	50	0	635	10	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0			3.0	5.6	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	0.99	
Frt	0.99			1.00	0.90	
Flt Protected	1.00			1.00	0.99	
Satd. Flow (prot)	1561			1588	1401	
Flt Permitted	1.00			1.00	0.99	
Satd. Flow (perm)	1561			1588	1401	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	510	52	0	661	10	26
RTOR Reduction (vph)	5	0	0	0	21	0
Lane Group Flow (vph)	557	0	0	661	15	0
Confl. Peds. (#/hr)		10	10		10	
Turn Type	NA			NA	Perm	
Protected Phases	2			3 4 6		
Permitted Phases					8	
Actuated Green, G (s)	34.1			54.9	13.9	
Effective Green, g (s)	34.1			48.9	13.9	
Actuated g/C Ratio	0.43			0.61	0.17	
Clearance Time (s)	6.0				5.6	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	665			970	243	
v/s Ratio Prot	c0.36			c0.42		
v/s Ratio Perm					c0.01	
v/c Ratio	0.84			0.68	0.06	
Uniform Delay, d1	20.5			10.4	27.6	
Progression Factor	0.64			0.35	0.72	
Incremental Delay, d2	10.7			0.5	0.1	
Delay (s)	23.8			4.2	20.0	
Level of Service	C			A	C	
Approach Delay (s)	23.8			4.2	20.0	
Approach LOS	C			A	C	

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
33: Tamalpais & 5th

Baseline Plus BioMarin Only Conditions

Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↕			↕		
Traffic Volume (vph)	0	455	5	0	290	15	30	25	20	10	20	20	
Future Volume (vph)	0	455	5	0	290	15	30	25	20	10	20	20	
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Total Lost time (s)		6.0			6.0			6.0			6.0		
Lane Util. Factor		1.00			1.00			1.00			1.00		
Frbp, ped/bikes		1.00			1.00			1.00			0.98		
Flpb, ped/bikes		1.00			1.00			0.99			1.00		
Frt		1.00			0.99			0.96			0.95		
Flt Protected		1.00			1.00			0.98			0.99		
Satd. Flow (prot)		1585			1574			1487			1461		
Flt Permitted		1.00			1.00			0.85			0.92		
Satd. Flow (perm)		1585			1574			1285			1356		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0	474	5	0	302	16	31	26	21	10	21	21	
RTOR Reduction (vph)	0	0	0	0	2	0	0	19	0	0	19	0	
Lane Group Flow (vph)	0	479	0	0	316	0	0	59	0	0	33	0	
Confl. Peds. (#/hr)	10		10	10		10	10					10	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			4 6			8			8		
Permitted Phases							8			8			
Actuated Green, G (s)		43.0			58.8			9.2			9.2		
Effective Green, g (s)		43.0			58.8			9.2			9.2		
Actuated g/C Ratio		0.54			0.73			0.11			0.11		
Clearance Time (s)		6.0						6.0			6.0		
Vehicle Extension (s)		3.0						1.5			1.5		
Lane Grp Cap (vph)		851			1156			147			155		
v/s Ratio Prot		c0.30			c0.20								
v/s Ratio Perm								c0.05			0.02		
v/c Ratio		0.56			0.27			0.40			0.22		
Uniform Delay, d1		12.3			3.5			32.9			32.1		
Progression Factor		0.58			0.05			0.38			0.84		
Incremental Delay, d2		2.3			0.0			0.6			0.1		
Delay (s)		9.4			0.2			13.0			27.1		
Level of Service		A			A			B			C		
Approach Delay (s)		9.4			0.2			13.0			27.1		
Approach LOS		A			A			B			C		
Intersection Summary													
HCM 2000 Control Delay			7.5									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.51										
Actuated Cycle Length (s)			80.0									Sum of lost time (s)	18.0
Intersection Capacity Utilization			47.6%									ICU Level of Service	A
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 34: Tamalpais & Mission

Baseline Plus BioMarin Only Conditions
 Timing Plan: PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	↗
Traffic Volume (vph)	515	0	0	625	10	25
Future Volume (vph)	515	0	0	625	10	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0			6.0	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.90	
Flt Protected	1.00			1.00	0.99	
Satd. Flow (prot)	1588			1588	1414	
Flt Permitted	1.00			1.00	0.99	
Satd. Flow (perm)	1588			1588	1414	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	536	0	0	651	10	26
RTOR Reduction (vph)	0	0	0	0	21	0
Lane Group Flow (vph)	536	0	0	651	15	0
Confl. Peds. (#/hr)		10				
Turn Type	NA			NA	Prot	
Protected Phases	2 8			6	3 4	
Permitted Phases						
Actuated Green, G (s)	53.6			34.1	14.8	
Effective Green, g (s)	48.0			34.1	14.8	
Actuated g/C Ratio	0.60			0.43	0.19	
Clearance Time (s)				6.0		
Vehicle Extension (s)				3.0		
Lane Grp Cap (vph)	952			676	261	
v/s Ratio Prot	c0.34			c0.41	c0.01	
v/s Ratio Perm						
v/c Ratio	0.56			0.96	0.06	
Uniform Delay, d1	9.7			22.3	26.9	
Progression Factor	0.29			1.04	1.83	
Incremental Delay, d2	0.4			20.9	0.0	
Delay (s)	3.3			44.0	49.1	
Level of Service	A			D	D	
Approach Delay (s)	3.3			44.0	49.1	
Approach LOS	A			D	D	

Intersection Summary			
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

35: Tamalpais & 5th

Baseline Plus BioMarin Only Conditions

Timing Plan: PM Peak Hour















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑			↑			↕					
Traffic Volume (vph)	0	485	0	0	285	15	20	20	20	0	0	0	
Future Volume (vph)	0	485	0	0	285	15	20	20	20	0	0	0	
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Total Lost time (s)		6.0			6.0			6.0					
Lane Util. Factor		1.00			1.00			1.00					
Frbp, ped/bikes		1.00			1.00			0.99					
Flpb, ped/bikes		1.00			1.00			1.00					
Frt		1.00			0.99			0.95					
Flt Protected		1.00			1.00			0.98					
Satd. Flow (prot)		1588			1573			1470					
Flt Permitted		1.00			1.00			0.98					
Satd. Flow (perm)		1588			1573			1470					
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0	505	0	0	297	16	21	21	21	0	0	0	
RTOR Reduction (vph)	0	0	0	0	2	0	0	18	0	0	0	0	
Lane Group Flow (vph)	0	505	0	0	311	0	0	45	0	0	0	0	
Confl. Peds. (#/hr)	10		10			10			10				
Turn Type		NA			NA		Split	NA					
Protected Phases		2 8			6		4	4					
Permitted Phases													
Actuated Green, G (s)		58.2			43.0			9.8					
Effective Green, g (s)		58.2			43.0			9.8					
Actuated g/C Ratio		0.73			0.54			0.12					
Clearance Time (s)					6.0			6.0					
Vehicle Extension (s)					3.0			1.5					
Lane Grp Cap (vph)		1155			845			180					
v/s Ratio Prot		c0.32			0.20			c0.03					
v/s Ratio Perm													
v/c Ratio		0.44			0.37			0.25					
Uniform Delay, d1		4.4			10.7			31.8					
Progression Factor		0.09			0.51			1.01					
Incremental Delay, d2		0.1			1.2			0.2					
Delay (s)		0.5			6.7			32.2					
Level of Service		A			A			C					
Approach Delay (s)		0.5			6.7			32.2			0.0		
Approach LOS		A			A			C			A		
Intersection Summary													
HCM 2000 Control Delay			4.9									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.45										
Actuated Cycle Length (s)			80.0									Sum of lost time (s)	18.0
Intersection Capacity Utilization			46.8%									ICU Level of Service	A
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
36: Tamalpais & 4th

Baseline Plus BioMarin Only Conditions

Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑			↑				
Traffic Volume (vph)	0	370	0	0	425	50	20	5	20	0	0	0
Future Volume (vph)	0	370	0	0	425	50	20	5	20	0	0	0
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		1.00			1.00			1.00				
Frbp, ped/bikes		1.00			0.98			0.99				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.99			0.94				
Flt Protected		1.00			1.00			0.98				
Satd. Flow (prot)		1588			1537			1442				
Flt Permitted		1.00			1.00			0.98				
Satd. Flow (perm)		1588			1537			1442				
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	385	0	0	443	52	21	5	21	0	0	0
RTOR Reduction (vph)	0	0	0	0	5	0	0	18	0	0	0	0
Lane Group Flow (vph)	0	385	0	0	490	0	0	29	0	0	0	0
Confl. Peds. (#/hr)	59		21			59			10			
Turn Type		NA			NA		Split	NA				
Protected Phases		2 8			6		4	4				
Permitted Phases												
Actuated Green, G (s)		55.1			36.8			13.3				
Effective Green, g (s)		55.1			36.8			13.3				
Actuated g/C Ratio		0.69			0.46			0.17				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)		1093			707			239				
v/s Ratio Prot		c0.24			c0.32			c0.02				
v/s Ratio Perm												
v/c Ratio		0.35			0.69			0.12				
Uniform Delay, d1		5.1			17.1			28.4				
Progression Factor		0.21			0.78			1.01				
Incremental Delay, d2		0.2			5.0			0.2				
Delay (s)		1.2			18.4			28.8				
Level of Service		A			B			C				
Approach Delay (s)		1.2			18.4			28.8			0.0	
Approach LOS		A			B			C			A	
Intersection Summary												
HCM 2000 Control Delay			11.8				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			80.0				Sum of lost time (s)		17.6			
Intersection Capacity Utilization			49.2%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

Arterial Level of Service: EB 2nd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
D	IV	25	18.1	28.8	46.9	0.07	5.2	F
C	IV	25	18.9	11.8	30.7	0.07	8.4	E
B	IV	25	17.9	45.4	63.3	0.07	3.8	F
A	IV	25	18.5	13.6	32.1	0.07	7.8	E
Lindaro	IV	25	25.3	20.3	45.6	0.14	11.1	D
Lincoln	IV	25	21.4	60.1	81.5	0.10	4.3	F
Francisco W.	IV	25	12.2	33.5	45.7	0.05	3.6	F
101 SBO on 2nd	IV	25	14.2	23.0	37.2	0.05	5.2	F
Total	IV		146.5	236.5	383.0	0.61	5.8	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetheron	IV	25	19.0	36.2	55.2	0.07	4.7	F
Tamalpais	IV	25	14.4	53.9	68.3	0.05	2.9	F
Lincoln	IV	25	13.2	20.0	33.2	0.05	5.4	F
Lindaro	IV	25	21.4	2.9	24.3	0.10	14.4	C
A	IV	25	25.3	14.8	40.1	0.14	12.6	D
B	IV	25	17.9	8.8	26.7	0.07	9.1	D
C	IV	25	19.0	4.5	23.5	0.07	11.0	D
D	IV	25	18.7	2.6	21.3	0.07	11.9	D
Total	IV		148.9	143.7	292.6	0.62	7.7	E

Arterial Level of Service: SB Hetheron

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Mission	IV	29	24.0	54.8	78.8	0.16	7.3	E
5th	IV	25	16.3	3.1	19.4	0.06	11.4	D
4th	IV	25	14.6	6.2	20.8	0.05	9.5	D
3rd	IV	25	17.7	10.4	28.1	0.07	8.5	E
2nd	IV	25	15.6	75.5	91.1	0.06	2.3	F
Total	IV		88.2	150.0	238.2	0.40	6.1	F

Arterial Level of Service: NB Irwin

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
2nd St	IV	30	25.2	33.9	59.1	0.17	10.2	D
3rd St	IV	25	14.8	19.0	33.8	0.06	5.9	F
4th	IV	25	18.3	17.6	35.9	0.07	6.9	F
5th	IV	25	14.6	9.9	24.5	0.06	8.1	E
Mission	IV	25	15.7	5.9	21.6	0.06	9.9	D
Total	IV		88.6	86.3	174.9	0.41	8.4	E

Arterial Level of Service: EB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lincoln	IV	25	28.5	14.6	43.1	0.16	13.2	C
Tamalpais	IV	25	16.0	49.8	65.8	0.06	3.3	F
Tamalpais	IV	25	3.1	5.7	8.8	0.01	4.8	F
Hetherton	IV	25	8.7	10.3	19.0	0.03	6.2	F
Irwin	IV	25	18.9	14.7	33.6	0.07	7.6	E
Total	IV		75.2	95.1	170.3	0.33	7.1	E

Arterial Level of Service: WB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Irwin	IV	25	21.6	27.6	49.2	0.10	7.2	E
Hetherton	IV	25	18.9	23.4	42.3	0.07	6.1	F
Tamalpais	IV	25	8.7	115.6	124.3	0.03	1.0	F
Tamalpais	IV	25	3.1	4.7	7.8	0.01	5.4	F
Lincoln	IV	25	16.0	80.8	96.8	0.06	2.2	F
Total	IV		68.3	252.1	320.4	0.27	3.1	F

Arterial Level of Service: EB 2nd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
D	IV	25	18.1	17.6	35.7	0.07	6.9	F
C	IV	25	18.9	13.8	32.7	0.07	7.9	E
B	IV	25	17.9	14.9	32.8	0.07	7.4	E
A	IV	25	18.5	12.1	30.6	0.07	8.2	E
Lindaro	IV	25	25.3	13.2	38.5	0.14	13.1	C
Lincoln	IV	25	21.4	63.0	84.4	0.10	4.1	F
Francisco W.	IV	25	12.2	35.3	47.5	0.05	3.5	F
101 SBO on Hetherton	IV	25	14.2	81.7	95.9	0.05	2.0	F
Total	IV		146.5	251.6	398.1	0.61	5.6	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	42.1	61.1	0.07	4.2	F
Tamalpais	IV	25	14.4	52.1	66.5	0.05	2.9	F
Lincoln	IV	25	13.2	18.0	31.2	0.05	5.8	F
Lindaro	IV	25	21.4	4.5	25.9	0.10	13.5	C
A	IV	25	25.3	6.4	31.7	0.14	16.0	C
B	IV	25	17.9	7.2	25.1	0.07	9.7	D
C	IV	25	19.0	4.3	23.3	0.07	11.1	D
D	IV	25	18.7	2.9	21.6	0.07	11.7	D
Total	IV		148.9	137.5	286.4	0.62	7.8	E

Arterial Level of Service: SB Hetherton

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Mission	IV	35	22.2	36.4	58.6	0.16	9.8	D
5th	IV	25	16.3	6.8	23.1	0.06	9.6	D
4th	IV	25	14.6	7.4	22.0	0.05	9.0	E
3rd	IV	25	17.7	22.8	40.5	0.07	5.9	F
2nd	IV	25	15.6	25.7	41.3	0.06	5.1	F
Total	IV		86.4	99.1	185.5	0.40	7.8	E

Arterial Level of Service: NB Irwin

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
2nd St	IV	38	19.3	33.0	52.3	0.17	11.6	D
3rd St	IV	25	14.8	19.0	33.8	0.06	5.9	F
4th	IV	25	18.9	3.7	22.6	0.07	11.4	D
5th	IV	25	14.0	12.8	26.8	0.05	7.1	E
Mission	IV	25	15.7	3.0	18.7	0.06	11.4	D
Total	IV		82.7	71.5	154.2	0.41	9.5	D

Arterial Level of Service: EB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lincoln	IV	25	28.5	12.1	40.6	0.16	14.0	C
Tamalpais	IV	25	16.1	25.9	42.0	0.06	5.2	F
Tamalpais	IV	25	4.3	3.1	7.4	0.02	7.9	E
Hetherton	IV	25	7.5	8.0	15.5	0.03	6.6	F
Irwin	IV	25	18.9	14.4	33.3	0.07	7.7	E
Total	IV		75.3	63.5	138.8	0.33	8.7	E

Arterial Level of Service: WB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Irwin	IV	25	21.6	30.4	52.0	0.10	6.8	F
Hetherton	IV	25	18.9	8.1	27.0	0.07	9.5	D
Tamalpais	IV	25	7.5	46.6	54.1	0.03	1.9	F
Tamalpais	IV	25	4.3	2.7	7.0	0.02	8.4	E
Lincoln	IV	25	16.1	31.9	48.0	0.06	4.6	F
Total	IV		68.4	119.7	188.1	0.27	5.3	F

Leisch Method for Weaving Analysis

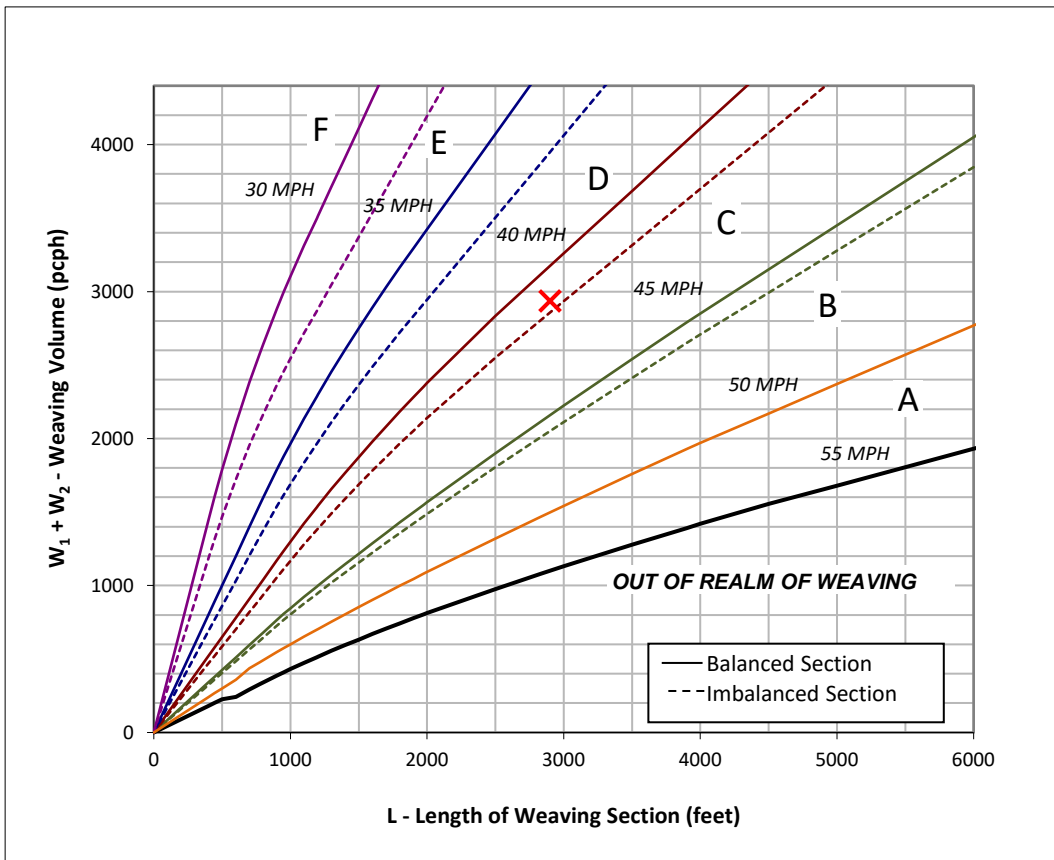
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	5
Length of Weaving Section (feet)	L	2,900

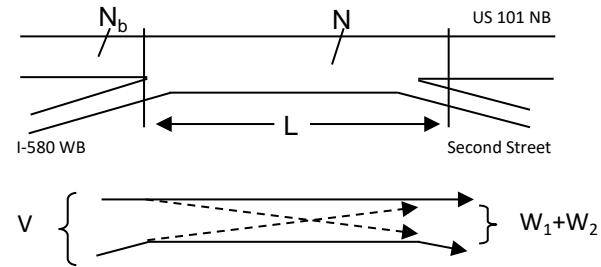
Project Information

Project	BioMarin
Scenario	Baseline + Project No SenCent AM PH
Freeway	US 101 NB
On-ramp	I-580 WB
Off-ramp	Second Street

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	5,787	Volume (vph)*	1,755	Volume (vph)*	1,061
Truck Percentage	4%	Truck Percentage	4%	Truck Percentage	4%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	2.0
Volume (pcph)	6,042	Volume (pcph)	1,832	Volume (pcph)	1,104



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
35 MPH and 40 MPH
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 39.6
- Weaving Intensity Factor (k) 2.55
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,550
- Level of Service (LOS) D

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Baseline + Project No Senior Center Conditions
Project Description	BioMarin - US 101 NB Second Street to Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	3833	Heavy Vehicle Adjustment Factor (f_{HV})	0.919
Peak Hour Factor (PHF)	0.99	Flow Rate ($v_{p,GP}$), pc/h/ln	1404
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.61
Passenger Car Equivalent (E_T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	23.4
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	718	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	820
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.50
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.8
Speed 2 (S_2), mi/h	0.2	Density (D_{ML}), pc/mi/ln	13.7
Speed 2 (S_3), mi/h	1.4	Level of Service (LOS)	B

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Baseline + Project No Senior Center Conditions
Project Description	BioMarin - US 101 NB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	4	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	2.86
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	1.02
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	5617	Heavy Vehicle Adjustment Factor (f_{HV})	0.889
Peak Hour Factor (PHF)	0.99	Flow Rate ($v_{p,GP}$), pc/h/ln	1596
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.69
Passenger Car Equivalent (E_T)	3.840		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	26.6
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	2.86

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1039	Heavy Vehicle Adjustment Factor (f_{HV})	0.916
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1246
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.76
Passenger Car Equivalent (E_T)	5.597		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	58.3
Speed 2 (S_2), mi/h	1.7	Density (D_{ML}), pc/mi/ln	21.4
Speed 2 (S_3), mi/h	7.7	Level of Service (LOS)	C

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	4/24/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Baseline + Project No Senior Center Conditions
Project Description	BioMarin - US 101 SB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	-2.44
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	0.77
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	5857	Heavy Vehicle Adjustment Factor (f_{HV})	0.951
Peak Hour Factor (PHF)	0.97	Flow Rate ($v_{p,GP}$), pc/h/ln	2116
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.92
Passenger Car Equivalent (E_T)	2.180		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	55.2
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	38.3
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1317	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.94	Flow Rate ($V_{p,ML}$), pc/h/ln	1440
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (E_T)	2.390		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	1
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	44.8
Speed 2 (S_2), mi/h	3.0	Density (D_{ML}), pc/mi/ln	32.1
Speed 2 (S_3), mi/h	12.2	Level of Service (LOS)	D

HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	3/17/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	Baseline + Project No Senior Center, AM Peak Hour
Project Description	BioMarin - US 101 Mission Ave Slip Off-Ramp		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	3	1
Free-Flow Speed (FFS), mi/h	60.0	50.0
Segment Length (L) / Deceleration Length (L _D), ft	1500	170
Terrain Type	Specific Grade	Specific Grade
Percent Grade, %	-2.44	-1.80
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Volume (V _i), veh/h	5857	1508
Peak Hour Factor (PHF)	0.97	0.92
Total Trucks, %	4.40	3.72
Single-Unit Trucks (SUT), %	66	66
Tractor-Trailers (TT), %	34	34
Heavy Vehicle Adjustment Factor (f _{HV})	0.951	0.958
Flow Rate (v _i), pc/h	6349	1711
Capacity (c), pc/h	6900	2100
Volume-to-Capacity Ratio (v/c)	0.92	0.81

Speed and Density

Upstream Equilibrium Distance (L _{EQ}), ft	65224.1	Density in Ramp Influence Area (D _R), pc/mi/ln	38.3
Distance to Upstream Ramp (L _{UP}), ft	10000	Speed Index (D _S)	0.387
Downstream Equilibrium Distance (L _{EQ}), ft	-	Flow Outer Lanes (v _{OA}), pc/h/ln	2212
Distance to Downstream Ramp (L _{DOWN}), ft	10000	Off-Ramp Influence Area Speed (S _R), mi/h	53.0
Prop. Freeway Vehicles in Lane 1 and 2 (P _{FD})	0.523	Outer Lanes Freeway Speed (S _O), mi/h	61.1
Flow in Lanes 1 and 2 (v ₁₂), pc/h	4137	Ramp Junction Speed (S), mi/h	55.6
Flow Entering Ramp-Infl. Area (v _{R12}), pc/h	-	Average Density (D), pc/mi/ln	38.1
Level of Service (LOS)	E		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44
Managed Lane Adjustment Factors			
Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V _{ML}), veh/h	1317	Heavy Vehicle Adjustment Factor (f _{HV})	0.973
Peak Hour Factor	0.94	Flow Rate (V _{p,ML}), pc/h/ln	1440
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C _{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (E _t)	2.390		
Managed Lane Speed and Density			
Breakpoint (BP _{ML})	501	Indicator Variable	1
Speed 1 (S ₁), mi/h	60.0	Average Speed (S _{ML}), mi/h	44.8
Speed 2 (S ₂), mi/h	3.0	Density (D _{ML}), pc/mi/ln	32.1
Speed 2 (S ₃), mi/h	12.2	Level of Service (LOS)	D

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	Baseline + Project No Senior Center, AM Peak Hour
Project Description	BioMarin - US 101 SB Mission Avenue to Second Street		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	4355	Heavy Vehicle Adjustment Factor (f_{HV})	0.919
Peak Hour Factor (PHF)	0.97	Flow Rate ($v_{p,GP}$), pc/h/ln	1628
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.71
Passenger Car Equivalent (E_T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	27.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	998	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.94	Flow Rate ($V_{p,ML}$), pc/h/ln	1104
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.67
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.0
Speed 2 (S_2), mi/h	1.0	Density (D_{ML}), pc/mi/ln	18.7
Speed 2 (S_3), mi/h	5.0	Level of Service (LOS)	C

Leisch Method for Weaving Analysis

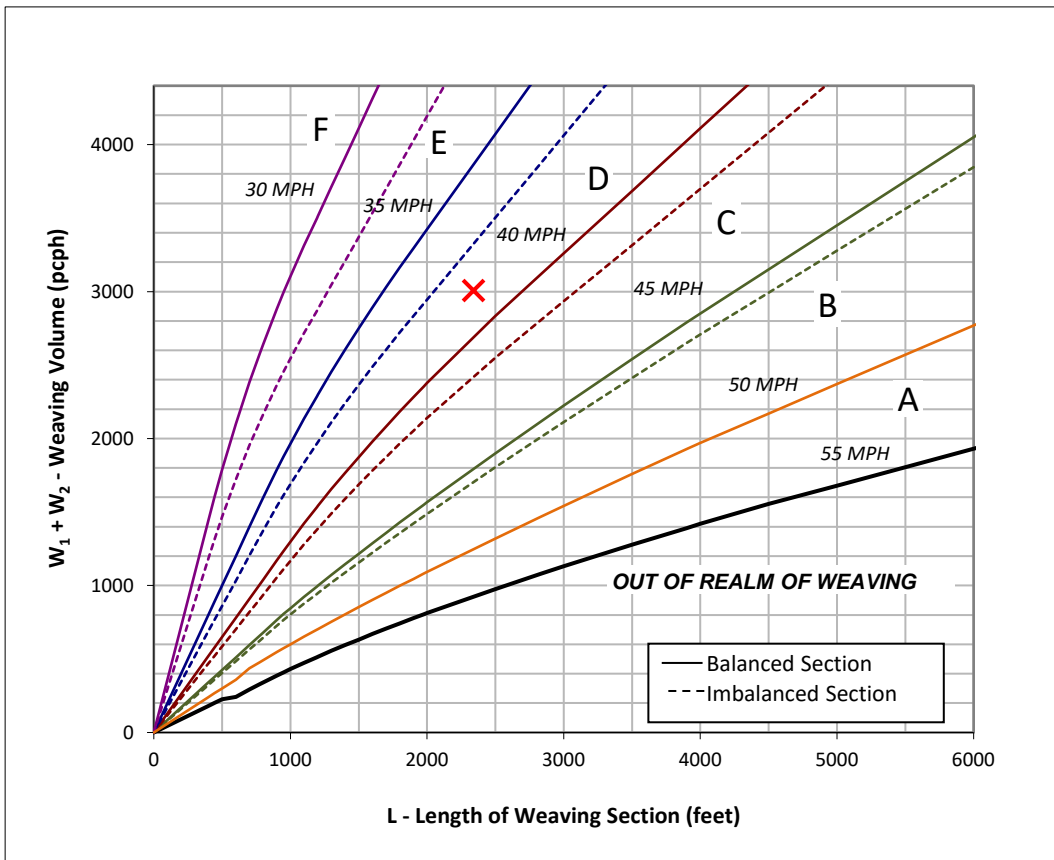
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	2,340

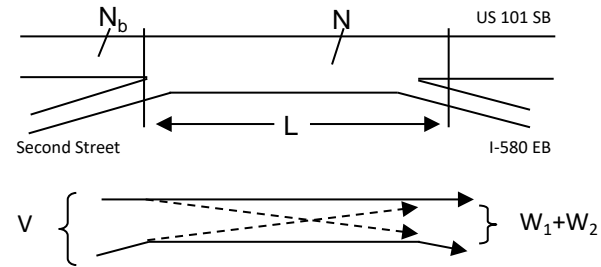
Project Information

Project	BioMarin
Scenario	Baseline + Project No SenCent AM PH
Freeway	US 101 SB
On-ramp	Second Street
Off-ramp	I-580 EB

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	6,705	Volume (vph)*	1,714	Volume (vph)*	1,178
Truck Percentage	4%	Truck Percentage	3%	Truck Percentage	2%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	4.1
Volume (pcph)	7,000	Volume (pcph)	1,760	Volume (pcph)	1,248



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
35 MPH and 40 MPH
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 38.7
- Weaving Intensity Factor (k) 2.60
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 2,251
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

Leisch Method for Weaving Analysis

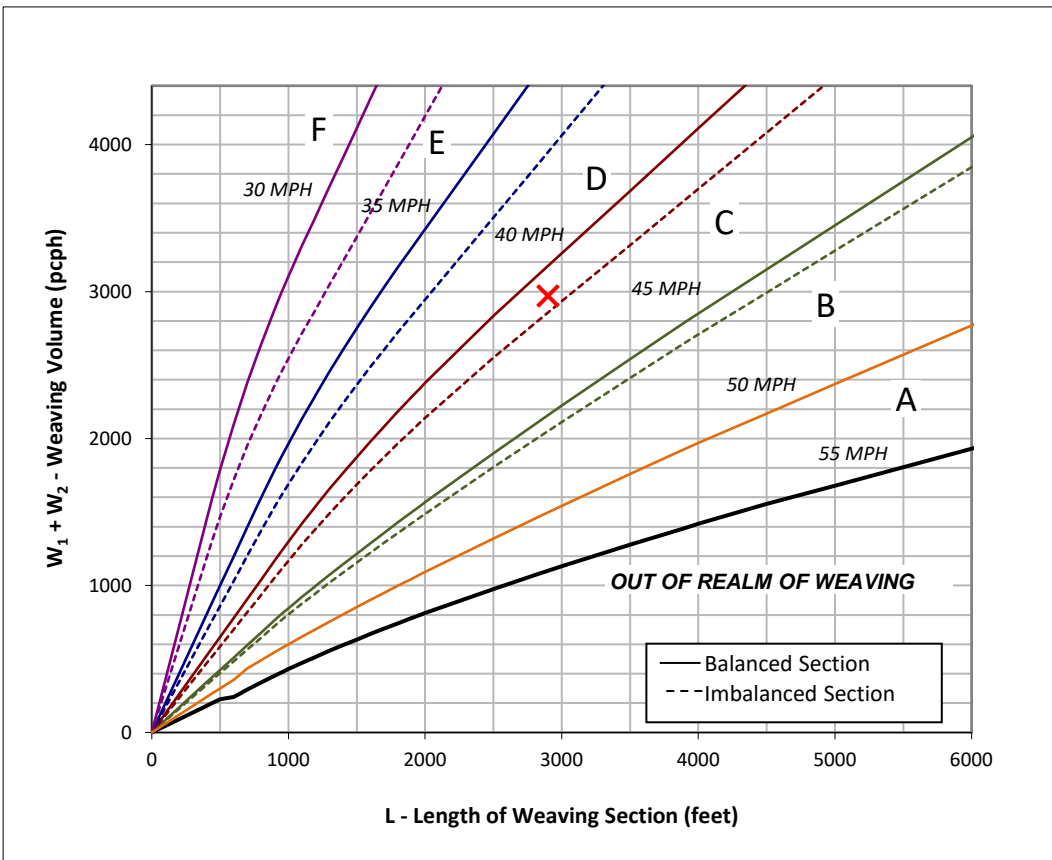
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	5
Length of Weaving Section (feet)	L	2,900

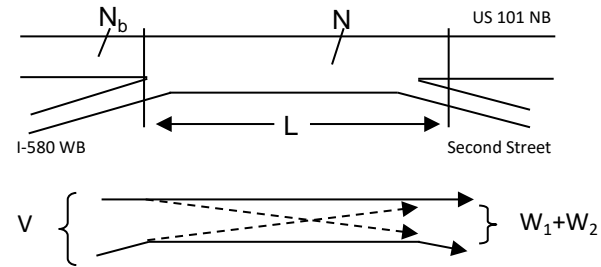
Project Information

Project	BioMarin
Scenario	Baseline + Project No SenCent PM PH
Freeway	US 101 NB
On-ramp	I-580 WB
Off-ramp	Second Street

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	6,746	Volume (vph)*	1,547	Volume (vph)*	1,321
Truck Percentage	4%	Truck Percentage	4%	Truck Percentage	3%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	2.0
Volume (pcph)	7,043	Volume (pcph)	1,615	Volume (pcph)	1,356



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
35 MPH and 40 MPH
 If left of the 30 MPH curve, LOS is F. Select "-".
 If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 39.5
- Weaving Intensity Factor (k) 2.55
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,830
- Level of Service (LOS) E

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Baseline + Project No Senior Center Conditions
Project Description	BioMarin - US 101 NB Second Street to Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	4799	Heavy Vehicle Adjustment Factor (f_{HV})	0.919
Peak Hour Factor (PHF)	0.98	Flow Rate ($v_{p,GP}$), pc/h/ln	1776
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.77
Passenger Car Equivalent (E_T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	59.4
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	29.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	848	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.99	Flow Rate ($V_{p,ML}$), pc/h/ln	890
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.54
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.7
Speed 2 (S_2), mi/h	0.3	Density (D_{ML}), pc/mi/ln	14.9
Speed 2 (S_3), mi/h	2.1	Level of Service (LOS)	B

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Baseline + Project No Senior Center Conditions
Project Description	BioMarin - US 101 NB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	4	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	2.86
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	1.02
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	7010	Heavy Vehicle Adjustment Factor (f_{HV})	0.889
Peak Hour Factor (PHF)	0.98	Flow Rate ($v_{p,GP}$), pc/h/ln	2012
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (E_T)	3.840		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	56.9
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	35.4
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	2.86

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1217	Heavy Vehicle Adjustment Factor (f_{HV})	0.916
Peak Hour Factor	0.99	Flow Rate ($V_{p,ML}$), pc/h/ln	1342
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.81
Passenger Car Equivalent (E_T)	5.597		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	1
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	47.9
Speed 2 (S_2), mi/h	2.3	Density (D_{ML}), pc/mi/ln	28.0
Speed 2 (S_3), mi/h	9.8	Level of Service (LOS)	D

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	4/24/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Baseline + Project No Senior Center Conditions
Project Description	BioMarin - US 101 SB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	-2.44
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	0.77
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	5077	Heavy Vehicle Adjustment Factor (f_{HV})	0.951
Peak Hour Factor (PHF)	0.97	Flow Rate ($v_{p,GP}$), pc/h/ln	1835
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.80
Passenger Car Equivalent (E_T)	2.180		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	59.0
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	31.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1377	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1555
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.94
Passenger Car Equivalent (E_T)	2.390		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	56.0
Speed 2 (S_2), mi/h	4.0	Density (D_{ML}), pc/mi/ln	27.8
Speed 2 (S_3), mi/h	15.4	Level of Service (LOS)	D

HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	4/24/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Baseline + Project No Senior Center Conditions
Project Description	BioMarin - US 101 Mission Ave Slip Off-Ramp		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	3	1
Free-Flow Speed (FFS), mi/h	60.0	50.0
Segment Length (L) / Deceleration Length (L _D), ft	1500	170
Terrain Type	Specific Grade	Specific Grade
Percent Grade, %	-2.44	-1.80
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Volume (V _i), veh/h	5077	1749
Peak Hour Factor (PHF)	0.97	0.96
Total Trucks, %	4.40	2.00
Single-Unit Trucks (SUT), %	66	66
Tractor-Trailers (TT), %	34	34
Heavy Vehicle Adjustment Factor (f _{HV})	0.951	0.973
Flow Rate (v _i), pc/h	5504	1872
Capacity (c), pc/h	6900	2100
Volume-to-Capacity Ratio (v/c)	0.80	0.89

Speed and Density

Upstream Equilibrium Distance (L _{EQ}), ft	102565.3	Density in Ramp Influence Area (D _R), pc/mi/ln	35.6
Distance to Upstream Ramp (L _{UP}), ft	10000	Speed Index (D _S)	0.401
Downstream Equilibrium Distance (L _{EQ}), ft	-	Flow Outer Lanes (v _{OA}), pc/h/ln	1685
Distance to Downstream Ramp (L _{DOWN}), ft	10000	Off-Ramp Influence Area Speed (S _R), mi/h	52.8
Prop. Freeway Vehicles in Lane 1 and 2 (P _{FD})	0.536	Outer Lanes Freeway Speed (S _O), mi/h	63.1
Flow in Lanes 1 and 2 (v ₁₂), pc/h	3819	Ramp Junction Speed (S), mi/h	55.6
Flow Entering Ramp-Infl. Area (v _{R12}), pc/h	-	Average Density (D), pc/mi/ln	33.0
Level of Service (LOS)	E		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44
Managed Lane Adjustment Factors			
Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V _{ML}), veh/h	1380	Heavy Vehicle Adjustment Factor (f _{HV})	0.973
Peak Hour Factor	0.91	Flow Rate (V _{p,ML}), pc/h/ln	1559
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C _{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.94
Passenger Car Equivalent (E _t)	2.390		
Managed Lane Speed and Density			
Breakpoint (BP _{ML})	501	Indicator Variable	0
Speed 1 (S ₁), mi/h	60.0	Average Speed (S _{ML}), mi/h	55.9
Speed 2 (S ₂), mi/h	4.1	Density (D _{ML}), pc/mi/ln	27.9
Speed 2 (S ₃), mi/h	15.5	Level of Service (LOS)	D

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Baseline + Project No Senior Center Conditions
Project Description	BioMarin - US 101 SB Mission Avenue to Second Street		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	3335	Heavy Vehicle Adjustment Factor (f_{HV})	0.919
Peak Hour Factor (PHF)	0.97	Flow Rate ($v_{p,GP}$), pc/h/ln	1247
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.54
Passenger Car Equivalent (E_T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	20.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	918	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1049
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.64
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.2
Speed 2 (S_2), mi/h	0.8	Density (D_{ML}), pc/mi/ln	17.7
Speed 2 (S_3), mi/h	4.2	Level of Service (LOS)	B

Leisch Method for Weaving Analysis

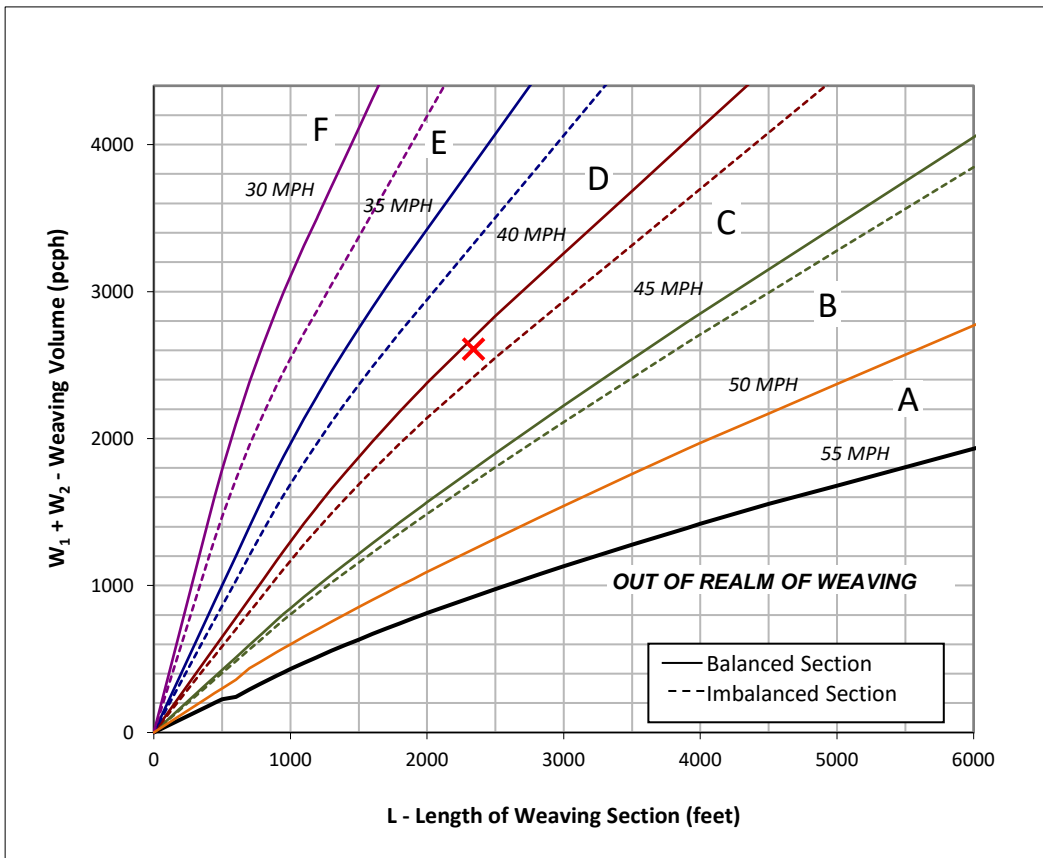
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	2,340

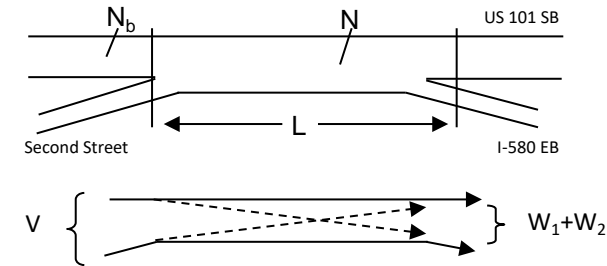
Project Information

Project	BioMarin
Scenario	Baseline + Project PM Peak Hour
Freeway	US 101 SB
On-ramp	Second Street
Off-ramp	I-580 EB

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	5,130	Volume (vph)*	1,035	Volume (vph)*	1,411
Truck Percentage	4%	Truck Percentage	3%	Truck Percentage	3%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	4.1
Volume (pcph)	5,356	Volume (pcph)	1,061	Volume (pcph)	1,548



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? **Y**
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
40 MPH and **45 MPH**
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) **40.5**
- Weaving Intensity Factor (k) **2.49**
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ **1,733**
- Level of Service (LOS) **E**

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

Appendix D: Baseline Plus Project Conditions (R&D and Senior Services and Housing) – Technical Calculations

Transportation Impact Study




















for BioMarin 999 3rd Street

San Rafael Campus Expansion

January 23, 2019

HCM 2010 Signalized Intersection Summary
1: Lincoln & Mission

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	460	20	70	570	50	20	210	40	60	391	360
Future Volume (veh/h)	110	460	20	70	570	50	20	210	40	60	391	360
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	0.99		0.97	0.99		0.94	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1660	1660	1710	1660	1660	1710	1800	1678	1728	1800	1748	1728
Adj Flow Rate, veh/h	120	500	20	76	620	50	22	228	34	65	425	182
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	2	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	148	865	35	372	625	50	73	508	72	144	846	349
Arrive On Green	0.09	0.55	0.55	0.55	0.55	0.55	0.85	0.85	0.85	0.43	0.43	0.43
Sat Flow, veh/h	1581	1582	63	817	1512	122	49	1192	169	205	1983	818
Grp Volume(v), veh/h	120	0	520	76	0	670	284	0	0	364	0	308
Grp Sat Flow(s),veh/h/ln	1581	0	1646	817	0	1634	1410	0	0	1621	0	1384
Q Serve(g_s), s	5.6	0.0	15.7	4.4	0.0	30.5	0.0	0.0	0.0	3.0	0.0	12.3
Cycle Q Clear(g_c), s	5.6	0.0	15.7	10.1	0.0	30.5	3.5	0.0	0.0	11.7	0.0	12.3
Prop In Lane	1.00		0.04	1.00		0.07	0.08		0.12	0.18		0.59
Lane Grp Cap(c), veh/h	148	0	900	372	0	675	653	0	0	748	0	590
V/C Ratio(X)	0.81	0.00	0.58	0.20	0.00	0.99	0.43	0.00	0.00	0.49	0.00	0.52
Avail Cap(c_a), veh/h	148	0	900	372	0	675	653	0	0	748	0	590
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.72	0.00	0.72	0.87	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.4	0.0	11.3	14.0	0.0	16.8	3.4	0.0	0.0	15.6	0.0	15.9
Incr Delay (d2), s/veh	36.9	0.0	2.7	0.9	0.0	27.5	1.8	0.0	0.0	2.3	0.0	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.0	7.8	1.1	0.0	18.6	1.5	0.0	0.0	5.9	0.0	5.2
LnGrp Delay(d),s/veh	70.3	0.0	14.0	14.9	0.0	44.2	5.2	0.0	0.0	17.9	0.0	19.1
LnGrp LOS	E		B	B		D	A			B		B
Approach Vol, veh/h		640			746			284			672	
Approach Delay, s/veh		24.5			41.2			5.2			18.4	
Approach LOS		C			D			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		45.2		36.8	10.0	35.2		36.8				
Change Period (Y+Rc), s		* 4.2		4.6	3.0	* 4.2		4.6				
Max Green Setting (Gmax), s		* 41		25.4	7.0	* 31		25.4				
Max Q Clear Time (g_c+I1), s		17.7		5.5	7.6	32.5		14.3				
Green Ext Time (p_c), s		5.1		2.4	0.0	0.0		4.5				
Intersection Summary												
HCM 2010 Ctrl Delay			25.8									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis

2: Hetherton & Mission

Baseline Plus Project Buildout

Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↑↑			↑						↑↑	↑		
Traffic Volume (vph)	0	490	80	40	220	0	0	0	0	220	1032	465		
Future Volume (vph)	0	490	80	40	220	0	0	0	0	220	1032	465		
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800		
Lane Width	12	10	12	12	16	12	12	12	12	12	12	12		
Total Lost time (s)		4.2			4.2						4.6	4.6		
Lane Util. Factor		0.95			1.00						0.95	1.00		
Frbp, ped/bikes		0.99			1.00						1.00	0.97		
Flpb, ped/bikes		1.00			1.00						1.00	1.00		
Frt		0.98			1.00						1.00	0.85		
Flt Protected		1.00			0.99						0.99	1.00		
Satd. Flow (prot)		2715			1766						2962	1302		
Flt Permitted		1.00			0.86						0.99	1.00		
Satd. Flow (perm)		2715			1534						2962	1302		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	0	533	87	43	239	0	0	0	0	239	1122	505		
RTOR Reduction (vph)	0	17	0	0	0	0	0	0	0	0	0	0		
Lane Group Flow (vph)	0	603	0	0	282	0	0	0	0	0	1361	505		
Confl. Peds. (#/hr)	15		22	22		15			16			1		
Confl. Bikes (#/hr)			3			2			1			3		
Turn Type		NA		Perm	NA					Split	NA	custom		
Protected Phases		4			8					2	2			
Permitted Phases				8								5		
Actuated Green, G (s)		32.8			32.8						33.4	26.4		
Effective Green, g (s)		32.8			32.8						33.4	26.4		
Actuated g/C Ratio		0.44			0.44						0.45	0.35		
Clearance Time (s)		4.2			4.2						4.6	4.6		
Vehicle Extension (s)		3.0			3.0						3.0	3.0		
Lane Grp Cap (vph)		1187			670						1319	458		
v/s Ratio Prot		c0.22									c0.46			
v/s Ratio Perm					0.18							0.39		
v/c Ratio		0.51			0.42						1.03	1.10		
Uniform Delay, d1		15.3			14.6						20.8	24.3		
Progression Factor		0.61			1.45						1.00	1.00		
Incremental Delay, d2		1.3			1.5						33.3	72.9		
Delay (s)		10.5			22.6						54.1	97.2		
Level of Service		B			C						D	F		
Approach Delay (s)		10.5			22.6			0.0			65.8			
Approach LOS		B			C			A			E			
Intersection Summary														
HCM 2000 Control Delay			49.0									HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio			0.80											
Actuated Cycle Length (s)			75.0								10.8		Sum of lost time (s)	
Intersection Capacity Utilization			92.6%										ICU Level of Service	F
Analysis Period (min)			15											
c Critical Lane Group														

HCM Signalized Intersection Capacity Analysis

3: Irwin & Mission




















Baseline Plus Project Buildout
Timing Plan: AM Peak Hour



Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2	
Lane Configurations											
Traffic Volume (vph)	380	20	310	160	320	5	110	1075	130	40	
Future Volume (vph)	380	20	310	160	320	5	110	1075	130	40	
Ideal Flow (vphpl)	2200	1800	2200	2200	2200	1800	2200	2200	1800	2200	
Lane Width	9	12	10	10	9	12	12	12	12	12	
Total Lost time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Lane Util. Factor		1.00	1.00	1.00	1.00			0.95	1.00		
Frbp, ped/bikes		1.00	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		
Frt		1.00	1.00	1.00	0.85			1.00	0.85		
Flt Protected		0.95	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (prot)		1494	1794	1615	1471			3428	1295		
Flt Permitted		0.60	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (perm)		938	1794	1615	1471			3428	1295		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	413	22	337	174	348	5	120	1168	141	43	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	44	0	
Lane Group Flow (vph)	0	435	337	174	353	0	0	1288	140	0	
Confl. Peds. (#/hr)							13			6	
Confl. Bikes (#/hr)					2	2				2	
Parking (#/hr)				0				2			
Turn Type	pm+pt	pm+pt	NA	NA	Prot		Perm	NA	Perm		
Protected Phases	5	5	2	6	6			4			
Permitted Phases	2	2					4			4	
Actuated Green, G (s)		33.8	33.8	18.8	18.8			32.8	32.8		
Effective Green, g (s)		33.8	33.8	18.8	18.8			32.8	32.8		
Actuated g/C Ratio		0.45	0.45	0.25	0.25			0.44	0.44		
Clearance Time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Lane Grp Cap (vph)		502	808	404	368			1499	566		
v/s Ratio Prot		c0.12	0.19	0.11	c0.24						
v/s Ratio Perm		0.27						0.38	0.11		
v/c Ratio		0.87	0.42	0.43	0.96			0.86	0.25		
Uniform Delay, d1		19.1	13.9	23.6	27.7			19.0	13.3		
Progression Factor		0.99	0.95	1.00	1.00			0.74	0.67		
Incremental Delay, d2		13.8	1.2	3.3	37.7			3.1	0.5		
Delay (s)		32.8	14.4	26.9	65.4			17.2	9.3		
Level of Service		C	B	C	E			B	A		
Approach Delay (s)			24.8	52.7				16.2			
Approach LOS			C	D				B			
Intersection Summary											
HCM 2000 Control Delay			25.6							HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.91								
Actuated Cycle Length (s)			75.0							Sum of lost time (s)	12.6
Intersection Capacity Utilization			89.7%							ICU Level of Service	E
Analysis Period (min)			15								
c	Critical Lane Group										

HCM 2010 Signalized Intersection Summary
4: Lincoln & 5th

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	300	40	70	280	30	10	220	45	40	401	40
Future Volume (veh/h)	30	300	40	70	280	30	10	220	45	40	401	40
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	0.99		0.94	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1398	1545	1530	1398	1485	1530	1440	1485	1469	1440	1485	1469
Adj Flow Rate, veh/h	33	326	36	76	304	28	11	239	39	43	436	39
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	243	534	59	257	524	48	58	523	83	82	534	46
Arrive On Green	0.39	0.39	0.39	0.13	0.13	0.13	0.97	0.97	0.97	0.97	0.97	0.97
Sat Flow, veh/h	825	1361	150	802	1336	123	16	1077	171	62	1101	95
Grp Volume(v), veh/h	33	0	362	76	0	332	289	0	0	518	0	0
Grp Sat Flow(s),veh/h/ln	825	0	1511	802	0	1459	1264	0	0	1258	0	0
Q Serve(g_s), s	2.6	0.0	14.4	6.9	0.0	16.1	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	18.6	0.0	14.4	21.2	0.0	16.1	0.9	0.0	0.0	4.4	0.0	0.0
Prop In Lane	1.00		0.10	1.00		0.08	0.04		0.13	0.08		0.08
Lane Grp Cap(c), veh/h	243	0	592	257	0	572	663	0	0	662	0	0
V/C Ratio(X)	0.14	0.00	0.61	0.30	0.00	0.58	0.44	0.00	0.00	0.78	0.00	0.00
Avail Cap(c_a), veh/h	243	0	592	257	0	572	663	0	0	662	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.94	0.00	0.94	0.85	0.00	0.00	0.50	0.00	0.00
Uniform Delay (d), s/veh	26.4	0.0	18.2	36.0	0.0	26.8	0.6	0.0	0.0	0.6	0.0	0.0
Incr Delay (d2), s/veh	1.2	0.0	4.6	2.8	0.0	4.0	1.8	0.0	0.0	4.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	6.7	1.7	0.0	7.1	0.6	0.0	0.0	1.3	0.0	0.0
LnGrp Delay(d),s/veh	27.6	0.0	22.9	38.8	0.0	30.9	2.3	0.0	0.0	5.3	0.0	0.0
LnGrp LOS	C		C	D		C	A			A		
Approach Vol, veh/h		395			408			289			518	
Approach Delay, s/veh		23.3			32.3			2.3			5.3	
Approach LOS		C			C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		34.0		41.0		34.0		41.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		29.4		36.4		29.4		36.4				
Max Q Clear Time (g_c+I1), s		20.6		2.9		23.2		6.4				
Green Ext Time (p_c), s		1.2		1.3		1.0		2.6				
Intersection Summary												
HCM 2010 Ctrl Delay			16.0									
HCM 2010 LOS			B									

HCM Signalized Intersection Capacity Analysis

5: Hetherton & 5th


















Baseline Plus Project Buildout
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↕↕↕	↔
Traffic Volume (vph)	0	240	165	40	245	0	0	0	0	50	987	115
Future Volume (vph)	0	240	165	40	245	0	0	0	0	50	987	115
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		1.00			1.00						0.91	1.00
Frbp, ped/bikes		0.99			1.00						1.00	0.95
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.95			1.00						1.00	0.85
Flt Protected		1.00			0.99						1.00	1.00
Satd. Flow (prot)		1665			1769						4118	1127
Flt Permitted		1.00			0.91						1.00	1.00
Satd. Flow (perm)		1665			1612						4118	1127
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	261	179	43	266	0	0	0	0	54	1073	125
RTOR Reduction (vph)	0	23	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	417	0	0	309	0	0	0	0	0	1127	125
Confl. Peds. (#/hr)			15	15		14			22	22		10
Confl. Bikes (#/hr)			4			2			2			2
Parking (#/hr)											2	2
Turn Type		NA		Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases				8						2		5
Actuated Green, G (s)		32.8			32.8						33.4	26.4
Effective Green, g (s)		32.8			32.8						33.4	26.4
Actuated g/C Ratio		0.44			0.44						0.45	0.35
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		728			704						1833	396
v/s Ratio Prot		c0.25										
v/s Ratio Perm					0.19						0.27	0.11
v/c Ratio		0.57			0.44						0.61	0.32
Uniform Delay, d1		15.8			14.7						15.9	17.7
Progression Factor		0.44			1.25						0.17	0.24
Incremental Delay, d2		3.1			1.2						0.4	0.6
Delay (s)		10.1			19.5						3.1	4.9
Level of Service		B			B						A	A
Approach Delay (s)		10.1			19.5			0.0			3.2	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.3									A
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			75.0							10.8		
Intersection Capacity Utilization			83.0%									E
Analysis Period (min)			15									
c Critical Lane Group												




















HCM 2010 Signalized Intersection Summary
6: Irwin & 5th

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	100	0	0	155	120	155	1125	10	0	0	0
Future Volume (veh/h)	140	100	0	0	155	120	155	1125	10	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.89	0.89	1.00	0.89			
Adj Sat Flow, veh/h/ln	1573	1573	0	0	1573	1620	1620	1573	1620			
Adj Flow Rate, veh/h	152	109	0	0	168	90	168	1223	10			
Adj No. of Lanes	1	1	0	0	1	0	0	2	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	0	3	0			
Cap, veh/h	237	491	0	0	265	142	180	1380	12			
Arrive On Green	0.10	0.10	0.00	0.00	0.31	0.31	0.19	0.19	0.19			
Sat Flow, veh/h	993	1573	0	0	849	455	318	2441	21			
Grp Volume(v), veh/h	152	109	0	0	0	258	731	0	670			
Grp Sat Flow(s),veh/h/ln	993	1573	0	0	0	1304	1384	0	1396			
Q Serve(g_s), s	10.7	4.8	0.0	0.0	0.0	12.7	39.0	0.0	34.8			
Cycle Q Clear(g_c), s	23.4	4.8	0.0	0.0	0.0	12.7	39.0	0.0	34.8			
Prop In Lane	1.00		0.00	0.00		0.35	0.23		0.01			
Lane Grp Cap(c), veh/h	237	491	0	0	0	407	782	0	789			
V/C Ratio(X)	0.64	0.22	0.00	0.00	0.00	0.63	0.93	0.00	0.85			
Avail Cap(c_a), veh/h	237	491	0	0	0	407	782	0	789			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	40.4	25.3	0.0	0.0	0.0	22.1	29.1	0.0	27.4			
Incr Delay (d2), s/veh	12.5	1.0	0.0	0.0	0.0	7.3	19.7	0.0	11.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.0	2.2	0.0	0.0	0.0	5.4	19.2	0.0	15.9			
LnGrp Delay(d),s/veh	52.9	26.3	0.0	0.0	0.0	29.5	48.8	0.0	38.4			
LnGrp LOS	D	C				C	D		D			
Approach Vol, veh/h		261			258			1401				
Approach Delay, s/veh		41.8			29.5			43.8				
Approach LOS		D			C			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		28.0		47.0		28.0						
Change Period (Y+Rc), s		4.6		4.6		4.6						
Max Green Setting (Gmax), s		23.4		42.4		23.4						
Max Q Clear Time (g_c+I1), s		25.4		41.0		14.7						
Green Ext Time (p_c), s		0.0		0.9		0.7						
Intersection Summary												
HCM 2010 Ctrl Delay				41.6								
HCM 2010 LOS				D								

HCM 2010 Signalized Intersection Summary
7: Lincoln & 4th

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	260	20	70	310	30	20	225	65	65	371	80
Future Volume (veh/h)	30	260	20	70	310	30	20	225	65	65	371	80
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.92	0.98		0.92	0.97		0.91	0.99		0.91
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1573	1510	1620	1573	1573	1620	1620	1573	1555	1620	1573	1555
Adj Flow Rate, veh/h	33	283	18	76	337	28	22	245	57	71	403	77
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	238	536	34	309	546	45	71	517	115	113	496	90
Arrive On Green	0.38	0.38	0.38	0.13	0.13	0.13	0.17	0.17	0.17	1.00	1.00	1.00
Sat Flow, veh/h	894	1396	89	937	1422	118	40	1026	228	116	984	179
Grp Volume(v), veh/h	33	0	301	76	0	365	324	0	0	551	0	0
Grp Sat Flow(s),veh/h/ln	894	0	1485	937	0	1540	1294	0	0	1279	0	0
Q Serve(g_s), s	2.4	0.0	11.7	5.8	0.0	16.8	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	19.3	0.0	11.7	17.5	0.0	16.8	16.5	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.08	0.07		0.18	0.13		0.14
Lane Grp Cap(c), veh/h	238	0	570	309	0	591	703	0	0	699	0	0
V/C Ratio(X)	0.14	0.00	0.53	0.25	0.00	0.62	0.46	0.00	0.00	0.79	0.00	0.00
Avail Cap(c_a), veh/h	238	0	570	309	0	591	703	0	0	699	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.92	0.00	0.92	0.43	0.00	0.00	0.45	0.00	0.00
Uniform Delay (d), s/veh	27.5	0.0	17.8	33.4	0.0	27.5	22.4	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	1.2	0.0	3.5	1.7	0.0	4.4	0.9	0.0	0.0	4.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	5.3	1.6	0.0	7.9	6.3	0.0	0.0	0.8	0.0	0.0
LnGrp Delay(d),s/veh	28.7	0.0	21.3	35.2	0.0	31.9	23.3	0.0	0.0	4.2	0.0	0.0
LnGrp LOS	C		C	D		C	C			A		
Approach Vol, veh/h		334			441			324			551	
Approach Delay, s/veh		22.1			32.5			23.3			4.2	
Approach LOS		C			C			C			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		33.0		42.0		33.0		42.0				
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2		* 4.2				
Max Green Setting (Gmax), s		* 29		* 38		* 29		* 38				
Max Q Clear Time (g_c+I1), s		21.3		18.5		19.5		2.0				
Green Ext Time (p_c), s		1.6		2.8		2.6		6.7				
Intersection Summary												
HCM 2010 Ctrl Delay				19.1								
HCM 2010 LOS				B								
Notes												

HCM Signalized Intersection Capacity Analysis
8: 4th & Tamalpais

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↔			↗
Traffic Volume (vph)	0	410	380	35	0	35
Future Volume (vph)	0	410	380	35	0	35
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.6	5.6			5.2
Lane Util. Factor		1.00	1.00			1.00
Frbp, ped/bikes		1.00	0.99			0.87
Flpb, ped/bikes		1.00	1.00			1.00
Frt		1.00	0.99			0.86
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		1573	1540			1188
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		1573	1540			1188
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	446	413	38	0	38
RTOR Reduction (vph)	0	0	4	0	0	32
Lane Group Flow (vph)	0	446	447	0	0	6
Confl. Peds. (#/hr)				39		46
Confl. Bikes (#/hr)				4		
Turn Type		NA	NA			Perm
Protected Phases		2 8	4 6			
Permitted Phases						8
Actuated Green, G (s)		50.7	51.8			12.4
Effective Green, g (s)		50.7	51.8			12.4
Actuated g/C Ratio		0.68	0.69			0.17
Clearance Time (s)						5.2
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)		1063	1063			196
v/s Ratio Prot		c0.28	c0.29			
v/s Ratio Perm						0.01
v/c Ratio		0.42	0.42			0.03
Uniform Delay, d1		5.5	5.1			26.3
Progression Factor		1.63	0.49			1.00
Incremental Delay, d2		0.2	0.2			0.1
Delay (s)		9.1	2.6			26.3
Level of Service		A	A			C
Approach Delay (s)		9.1	2.6		26.3	
Approach LOS		A	A		C	
Intersection Summary						
HCM 2000 Control Delay			6.7		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.48			
Actuated Cycle Length (s)			75.0		Sum of lost time (s)	16.4
Intersection Capacity Utilization			46.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
9: Hetherton & 4th


















Baseline Plus Project Buildout
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↖	↑						↑↑↑	↗
Traffic Volume (vph)	0	285	130	185	285	0	0	0	0	105	887	200
Future Volume (vph)	0	285	130	185	285	0	0	0	0	105	887	200
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	13	10	15	11	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Lane Util. Factor		1.00	1.00	1.00	1.00						0.91	1.00
Frbp, ped/bikes		1.00	0.95	1.00	1.00						1.00	0.89
Flpb, ped/bikes		1.00	1.00	0.98	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						0.99	1.00
Satd. Flow (prot)		1625	1180	1606	1520						4264	1185
Flt Permitted		1.00	1.00	0.49	1.00						0.99	1.00
Satd. Flow (perm)		1625	1180	832	1520						4264	1185
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	310	141	201	310	0	0	0	0	114	964	217
RTOR Reduction (vph)	0	0	29	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	310	112	201	310	0	0	0	0	0	1078	217
Confl. Peds. (#/hr)			40	40		22			9	9		30
Confl. Bikes (#/hr)			8			4						2
Turn Type		NA	Perm	Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases			4	8						2		5
Actuated Green, G (s)		32.8	32.8	32.8	32.8						33.4	26.4
Effective Green, g (s)		32.8	32.8	32.8	32.8						33.4	26.4
Actuated g/C Ratio		0.44	0.44	0.44	0.44						0.45	0.35
Clearance Time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		710	516	363	664						1898	417
v/s Ratio Prot		0.19			0.20							
v/s Ratio Perm			0.09	0.24							0.25	0.18
v/c Ratio		0.44	0.22	0.55	0.47						0.57	0.52
Uniform Delay, d1		14.7	13.1	15.7	14.9						15.4	19.3
Progression Factor		0.39	0.26	1.01	1.03						0.33	0.43
Incremental Delay, d2		1.8	0.9	4.4	1.7						1.0	3.7
Delay (s)		7.5	4.3	20.3	17.2						6.1	11.9
Level of Service		A	A	C	B						A	B
Approach Delay (s)		6.5			18.4			0.0			7.1	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.5			HCM 2000 Level of Service					A	
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			75.0			Sum of lost time (s)				10.8		
Intersection Capacity Utilization			84.7%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												















HCM 2010 Signalized Intersection Summary
10: Irwin & 4th

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	230	0	0	345	70	130	1090	50	0	0	0
Future Volume (veh/h)	160	230	0	0	345	70	130	1090	50	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.95	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89			
Adj Sat Flow, veh/h/ln	1573	1573	0	0	1573	1620	1510	1573	1620			
Adj Flow Rate, veh/h	174	250	0	0	375	65	141	1185	50			
Adj No. of Lanes	1	1	0	0	1	0	1	2	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	152	604	0	0	443	77	725	1389	59			
Arrive On Green	0.77	0.77	0.00	0.00	0.13	0.13	0.17	0.17	0.17			
Sat Flow, veh/h	842	1573	0	0	1153	200	1438	2756	116			
Grp Volume(v), veh/h	174	250	0	0	0	440	141	642	593			
Grp Sat Flow(s),veh/h/ln	842	1573	0	0	0	1353	1438	1494	1378			
Q Serve(g_s), s	4.9	4.1	0.0	0.0	0.0	23.9	6.3	31.3	31.3			
Cycle Q Clear(g_c), s	28.8	4.1	0.0	0.0	0.0	23.9	6.3	31.3	31.3			
Prop In Lane	1.00		0.00	0.00		0.15	1.00		0.08			
Lane Grp Cap(c), veh/h	152	604	0	0	0	520	725	753	695			
V/C Ratio(X)	1.15	0.41	0.00	0.00	0.00	0.85	0.19	0.85	0.85			
Avail Cap(c_a), veh/h	152	604	0	0	0	520	725	753	695			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33			
Upstream Filter(I)	0.90	0.90	0.00	0.00	0.00	1.00	0.29	0.29	0.29			
Uniform Delay (d), s/veh	22.2	5.8	0.0	0.0	0.0	30.6	18.1	28.6	28.6			
Incr Delay (d2), s/veh	114.7	1.9	0.0	0.0	0.0	15.6	0.2	3.8	4.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	7.9	1.9	0.0	0.0	0.0	11.2	2.6	13.8	12.8			
LnGrp Delay(d),s/veh	136.9	7.7	0.0	0.0	0.0	46.2	18.3	32.4	32.7			
LnGrp LOS	F	A				D	B	C	C			
Approach Vol, veh/h		424			440			1376				
Approach Delay, s/veh		60.7			46.2			31.1				
Approach LOS		E			D			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		33.0		42.0		33.0						
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2						
Max Green Setting (Gmax), s		* 29		* 38		* 29						
Max Q Clear Time (g_c+I1), s		30.8		33.3		25.9						
Green Ext Time (p_c), s		0.0		2.6		0.6						
Intersection Summary												
HCM 2010 Ctrl Delay				39.7								
HCM 2010 LOS				D								
Notes												













HCM 2010 Signalized Intersection Summary
 11: D & 3rd

Baseline Plus Project Buildout
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	295	1137	0	0	0	0	0	230	30
Future Volume (veh/h)	0	0	0	295	1137	0	0	0	0	0	230	30
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.99
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1530	1485	0				0	1485	1530
Adj Flow Rate, veh/h				321	1236	0				0	250	18
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				502	1719	0				0	786	56
Arrive On Green				0.19	0.19	0.00				0.00	0.31	0.31
Sat Flow, veh/h				747	3134	0				0	2593	180
Grp Volume(v), veh/h				558	999	0				0	139	129
Grp Sat Flow(s),veh/h/ln				1299	1230	0				0	1411	1288
Q Serve(g_s), s				30.5	28.5	0.0				0.0	5.6	5.7
Cycle Q Clear(g_c), s				30.5	28.5	0.0				0.0	5.6	5.7
Prop In Lane				0.57		0.00				0.00		0.14
Lane Grp Cap(c), veh/h				817	1404	0				0	440	402
V/C Ratio(X)				0.68	0.71	0.00				0.00	0.32	0.32
Avail Cap(c_a), veh/h				817	1404	0				0	440	402
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				25.4	24.6	0.0				0.0	19.7	19.7
Incr Delay (d2), s/veh				4.6	3.1	0.0				0.0	1.9	2.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				12.0	10.3	0.0				0.0	2.4	2.3
LnGrp Delay(d),s/veh				30.1	27.7	0.0				0.0	21.6	21.8
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1557						268	
Approach Delay, s/veh					28.6						21.7	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		47.0		28.0								
Change Period (Y+Rc), s		* 4.2		4.6								
Max Green Setting (Gmax), s		* 43		23.4								
Max Q Clear Time (g_c+I1), s		32.5		7.7								
Green Ext Time (p_c), s		5.7		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay				27.6								
HCM 2010 LOS				C								
Notes												















HCM 2010 Signalized Intersection Summary
12: C & 3rd

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑		↑↑				
Traffic Volume (veh/h)	0	0	0	0	1317	110	100	235	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1317	110	100	235	0	0	0	0
Number				5	2	12	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.98	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1398	1398	1440	1398	0			
Adj Flow Rate, veh/h				0	1432	82	109	255	0			
Adj No. of Lanes				0	3	1	0	2	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	3	3	3	3	0			
Cap, veh/h				0	2229	679	266	553	0			
Arrive On Green				0.00	0.19	0.19	0.10	0.10	0.00			
Sat Flow, veh/h				0	3943	1163	630	1883	0			
Grp Volume(v), veh/h				0	1432	82	197	167	0			
Grp Sat Flow(s),veh/h/ln				0	1272	1163	1241	1209	0			
Q Serve(g_s), s				0.0	25.9	4.4	9.6	9.7	0.0			
Cycle Q Clear(g_c), s				0.0	25.9	4.4	11.2	9.7	0.0			
Prop In Lane				0.00		1.00	0.55		0.00			
Lane Grp Cap(c), veh/h				0	2229	679	452	367	0			
V/C Ratio(X)				0.00	0.64	0.12	0.44	0.45	0.00			
Avail Cap(c_a), veh/h				0	2229	679	452	367	0			
HCM Platoon Ratio				1.00	0.33	0.33	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	23.1	14.4	28.4	27.9	0.0			
Incr Delay (d2), s/veh				0.0	1.4	0.4	3.1	4.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	9.4	1.5	4.3	3.7	0.0			
LnGrp Delay(d),s/veh				0.0	24.5	14.7	31.5	31.9	0.0			
LnGrp LOS					C	B	C	C				
Approach Vol, veh/h					1514			364				
Approach Delay, s/veh					24.0			31.7				
Approach LOS					C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		48.0		27.0								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 44		* 23								
Max Q Clear Time (g_c+I1), s		27.9		13.2								
Green Ext Time (p_c), s		7.6		1.0								
Intersection Summary												
HCM 2010 Ctrl Delay				25.5								
HCM 2010 LOS				C								
Notes												

















HCM 2010 Signalized Intersection Summary
 13: B & 3rd

Baseline Plus Project Buildout
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	90	1372	0	0	0	0	0	190	50
Future Volume (veh/h)	0	0	0	90	1372	0	0	0	0	0	190	50
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.87
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1440	1398	0				0	1398	1440
Adj Flow Rate, veh/h				98	1491	0				0	207	25
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				167	2129	0				0	616	72
Arrive On Green				0.20	0.20	0.00				0.00	0.28	0.28
Sat Flow, veh/h				181	3601	0				0	2290	261
Grp Volume(v), veh/h				590	999	0				0	122	110
Grp Sat Flow(s),veh/h/ln				1353	1158	0				0	1328	1153
Q Serve(g_s), s				21.9	30.1	0.0				0.0	5.5	5.7
Cycle Q Clear(g_c), s				30.4	30.1	0.0				0.0	5.5	5.7
Prop In Lane				0.17		0.00				0.00		0.23
Lane Grp Cap(c), veh/h				882	1414	0				0	368	320
V/C Ratio(X)				0.67	0.71	0.00				0.00	0.33	0.34
Avail Cap(c_a), veh/h				882	1414	0				0	368	320
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				23.7	23.7	0.0				0.0	21.6	21.7
Incr Delay (d2), s/veh				4.0	3.0	0.0				0.0	2.4	2.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				12.4	10.3	0.0				0.0	2.2	2.1
LnGrp Delay(d),s/veh				27.7	26.7	0.0				0.0	24.0	24.6
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1589						232	
Approach Delay, s/veh					27.1						24.3	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		50.0		25.0								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 46		* 21								
Max Q Clear Time (g_c+I1), s		32.4		7.7								
Green Ext Time (p_c), s		6.8		0.7								
Intersection Summary												
HCM 2010 Ctrl Delay				26.7								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary
14: A & 3rd

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	40	1227	80	195	120	0	0	130	30
Future Volume (veh/h)	0	0	0	40	1227	80	195	120	0	0	130	30
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	0.97		1.00	1.00		0.93
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1800	1748	1800	1835	1835	0	0	1835	1890
Adj Flow Rate, veh/h				43	1334	77	212	130	0	0	141	21
Adj No. of Lanes				0	3	0	1	1	0	0	1	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	3	0	3	3	0	0	3	3
Cap, veh/h				72	2357	141	371	685	0	0	358	53
Arrive On Green				0.17	0.17	0.17	0.02	0.12	0.00	0.00	0.26	0.26
Sat Flow, veh/h				139	4591	274	1748	1835	0	0	1375	205
Grp Volume(v), veh/h				537	447	470	212	130	0	0	0	162
Grp Sat Flow(s),veh/h/ln				1741	1590	1674	1748	1835	0	0	0	1580
Q Serve(g_s), s				21.4	19.3	19.3	0.0	4.8	0.0	0.0	0.0	6.3
Cycle Q Clear(g_c), s				21.4	19.3	19.3	0.0	4.8	0.0	0.0	0.0	6.3
Prop In Lane				0.08		0.16	1.00		0.00	0.00		0.13
Lane Grp Cap(c), veh/h				894	816	859	371	685	0	0	0	411
V/C Ratio(X)				0.60	0.55	0.55	0.57	0.19	0.00	0.00	0.00	0.39
Avail Cap(c_a), veh/h				894	816	859	371	685	0	0	0	411
HCM Platoon Ratio				0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				24.0	23.2	23.2	30.1	22.7	0.0	0.0	0.0	22.9
Incr Delay (d2), s/veh				3.0	2.6	2.5	6.2	0.6	0.0	0.0	0.0	2.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.0	9.1	9.5	5.0	2.5	0.0	0.0	0.0	3.1
LnGrp Delay(d),s/veh				27.0	25.8	25.7	36.3	23.3	0.0	0.0	0.0	25.7
LnGrp LOS				C	C	C	D	C				C
Approach Vol, veh/h					1454			342			162	
Approach Delay, s/veh					26.2			31.4			25.7	
Approach LOS					C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			8.0	24.0		43.0		32.0				
Change Period (Y+Rc), s			4.0	4.5		4.5		4.0				
Max Green Setting (Gmax), s			4.0	19.5		38.5		28.0				
Max Q Clear Time (g_c+I1), s			2.0	8.3		23.4		6.8				
Green Ext Time (p_c), s			0.3	0.8		10.6		0.9				
Intersection Summary												
HCM 2010 Ctrl Delay				27.1								
HCM 2010 LOS				C								

Intersection 15 Brooks St/3rd St Side-street Stop
















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	21	18	84.1%	8.7	2.9	A
	Through	5	5	103.0%	24.9	20.1	C
	Right Turn						
	Subtotal	26	23	87.8%	13.0	4.3	B
SB	Left Turn						
	Through	5	7	132.5%	23.5	17.4	C
	Right Turn	5	4	88.3%	8.9	9.5	A
	Subtotal	10	11	110.4%	22.3	11.5	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	51	54	106.1%	2.7	0.2	A
	Through	1,321	1,301	98.5%	2.4	0.3	A
	Right Turn	5	6	110.4%	2.2	1.9	A
	Subtotal	1,377	1,361	98.8%	2.4	0.3	A
Total		1,413	1,395	98.7%	2.8	0.4	A

Intersection 16 Lindero St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	86	82	95.0%	15.7	5.4	B
	Through	10	11	114.1%	10.5	9.9	B
	Right Turn						
	Subtotal	96	93	97.0%	15.5	5.5	B
SB	Left Turn						
	Through	40	37	92.0%	28.3	7.5	C
	Right Turn	10	8	77.3%	16.1	12.4	B
	Subtotal	50	45	89.1%	26.5	7.9	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	452	426	94.3%	20.0	11.1	B
	Through	1,311	1,304	99.5%	7.4	3.5	A
	Right Turn	30	28	94.5%	5.8	2.4	A
	Subtotal	1,793	1,759	98.1%	10.4	5.3	B
Total		1,939	1,896	97.8%	11.1	5.1	B



















HCM 2010 Signalized Intersection Summary
17: Lincoln & 3rd

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	160	1675	55	32	195	0	0	280	166
Future Volume (veh/h)	0	0	0	160	1675	55	32	195	0	0	280	166
Number				1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.92	1.00		1.00	1.00		0.91
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Adj Sat Flow, veh/h/ln				1620	1573	1620	1620	1573	0	0	1510	1555
Adj Flow Rate, veh/h				174	1821	56	35	212	0	0	304	175
Adj No. of Lanes				0	3	0	0	1	0	0	1	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	3	0	3	3	0	0	3	3
Cap, veh/h				200	2233	71	55	212	0	0	250	144
Arrive On Green				0.18	0.18	0.18	0.11	0.11	0.00	0.00	0.11	0.11
Sat Flow, veh/h				361	4035	127	0	649	0	0	765	440
Grp Volume(v), veh/h				749	626	675	247	0	0	0	0	479
Grp Sat Flow(s),veh/h/ln				1555	1431	1537	649	0	0	0	0	1205
Q Serve(g_s), s				35.1	31.4	31.5	0.0	0.0	0.0	0.0	0.0	24.5
Cycle Q Clear(g_c), s				35.1	31.4	31.5	24.5	0.0	0.0	0.0	0.0	24.5
Prop In Lane				0.23		0.08	0.14		0.00	0.00		0.37
Lane Grp Cap(c), veh/h				860	792	851	267	0	0	0	0	394
V/C Ratio(X)				0.87	0.79	0.79	0.93	0.00	0.00	0.00	0.00	1.22
Avail Cap(c_a), veh/h				860	792	851	267	0	0	0	0	394
HCM Platoon Ratio				0.33	0.33	0.33	0.33	0.33	1.00	1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				28.0	26.5	26.6	29.0	0.0	0.0	0.0	0.0	33.5
Incr Delay (d2), s/veh				11.7	7.9	7.5	38.9	0.0	0.0	0.0	0.0	118.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				17.9	14.2	15.2	8.0	0.0	0.0	0.0	0.0	21.1
LnGrp Delay(d),s/veh				39.8	34.4	34.1	68.0	0.0	0.0	0.0	0.0	152.0
LnGrp LOS				D	C	C	E					F
Approach Vol, veh/h					2051			247			479	
Approach Delay, s/veh					36.3			68.0			152.0	
Approach LOS					D			E			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				29.0		46.0		29.0				
Change Period (Y+Rc), s				4.5		4.5		4.5				
Max Green Setting (Gmax), s				24.5		41.5		24.5				
Max Q Clear Time (g_c+I1), s				26.5		37.1		26.5				
Green Ext Time (p_c), s				0.0		3.4		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				59.1								
HCM 2010 LOS				E								


















HCM Signalized Intersection Capacity Analysis
18: Tamalpais & 3rd

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  							
Traffic Volume (vph)	0	0	0	235	1815	20	50	50	0	0	50	10
Future Volume (vph)	0	0	0	235	1815	20	50	50	0	0	50	10
Ideal Flow (vphpl)	1800	1800	1800	1600	1600	1600	1600	1600	1800	1800	1600	1600
Lane Width	12	12	12	12	12	12	11	12	12	12	12	12
Total Lost time (s)					11.6		7.6	7.6			7.6	
Lane Util. Factor					0.91		1.00	1.00			1.00	
Frbp, ped/bikes					1.00		1.00	1.00			0.99	
Flpb, ped/bikes					0.98		0.93	1.00			1.00	
Frt					1.00		1.00	1.00			0.98	
Flt Protected					0.99		0.95	1.00			1.00	
Satd. Flow (prot)					3715		1060	1237			1191	
Flt Permitted					0.99		0.71	1.00			1.00	
Satd. Flow (perm)					3715		797	1237			1191	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	255	1973	22	54	54	0	0	54	11
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	0	0	0	2249	0	54	54	0	0	59	0
Confl. Peds. (#/hr)			73	73		38	49		63			49
Confl. Bikes (#/hr)						2			2			2
Parking (#/hr)							3	3			3	3
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					6			4			8	
Permitted Phases				6			4					
Actuated Green, G (s)					51.6		19.2	19.2			19.2	
Effective Green, g (s)					51.6		19.2	19.2			19.2	
Actuated g/C Ratio					0.57		0.21	0.21			0.21	
Clearance Time (s)					11.6		7.6	7.6			7.6	
Lane Grp Cap (vph)					2129		170	263			254	
v/s Ratio Prot								0.04			0.05	
v/s Ratio Perm					0.61		c0.07					
v/c Ratio					1.06		0.32	0.21			0.23	
Uniform Delay, d1					19.2		29.9	29.1			29.3	
Progression Factor					1.00		1.00	1.00			1.00	
Incremental Delay, d2					36.4		4.9	1.8			2.1	
Delay (s)					55.6		34.7	30.9			31.4	
Level of Service					E		C	C			C	
Approach Delay (s)		0.0			55.6			32.8			31.4	
Approach LOS		A			E			C			C	
Intersection Summary												
HCM 2000 Control Delay			53.9		HCM 2000 Level of Service						D	
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)						19.2	
Intersection Capacity Utilization			146.4%		ICU Level of Service						H	
Analysis Period (min)			15									
c Critical Lane Group												













HCM 2010 Signalized Intersection Summary
 19: Hetherton & 3rd

Baseline Plus Project Buildout
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	420	1563	0	0	0	0	0	750	452
Future Volume (veh/h)	0	0	0	420	1563	0	0	0	0	0	750	452
Number				1	6	16				3	8	18
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.83
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1545	1573	0				0	1573	1485
Adj Flow Rate, veh/h				457	1699	0				0	815	482
Adj No. of Lanes				1	3	0				0	3	1
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				743	2076	0				0	1889	462
Arrive On Green				0.15	0.15	0.00				0.00	0.15	0.15
Sat Flow, veh/h				1471	4718	0				0	4435	1051
Grp Volume(v), veh/h				457	1699	0				0	815	482
Grp Sat Flow(s),veh/h/ln				1471	1573	0				0	1431	1051
Q Serve(g_s), s				22.2	26.2	0.0				0.0	13.0	33.0
Cycle Q Clear(g_c), s				22.2	26.2	0.0				0.0	13.0	33.0
Prop In Lane				1.00		0.00				0.00		1.00
Lane Grp Cap(c), veh/h				743	2076	0				0	1889	462
V/C Ratio(X)				0.61	0.82	0.00				0.00	0.43	1.04
Avail Cap(c_a), veh/h				743	2076	0				0	1889	462
HCM Platoon Ratio				0.33	0.33	1.00				1.00	0.33	0.33
Upstream Filter(l)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				27.4	29.1	0.0				0.0	23.5	32.1
Incr Delay (d2), s/veh				3.8	3.7	0.0				0.0	0.7	53.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				9.8	12.2	0.0				0.0	5.3	16.4
LnGrp Delay(d),s/veh				31.2	32.9	0.0				0.0	24.2	85.4
LnGrp LOS				C	C						C	F
Approach Vol, veh/h					2156						1297	
Approach Delay, s/veh					32.5						47.0	
Approach LOS					C						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs						6		8				
Phs Duration (G+Y+Rc), s						37.0		38.0				
Change Period (Y+Rc), s						4.0		5.0				
Max Green Setting (Gmax), s						33.0		33.0				
Max Q Clear Time (g_c+I1), s						28.2		35.0				
Green Ext Time (p_c), s						3.9		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay					37.9							
HCM 2010 LOS					D							
Notes												
User approved volume balancing among the lanes for turning movement.												













HCM 2010 Signalized Intersection Summary
20: Irwin & 3rd/3rd St

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑	↑	↑↑↑				
Traffic Volume (veh/h)	0	0	0	0	1026	120	967	1155	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1026	120	967	1155	0	0	0	0
Number				1	6	16	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.94	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1485	1485	1398	1398	0			
Adj Flow Rate, veh/h				0	1115	100	1051	1255	0			
Adj No. of Lanes				0	3	1	2	2	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	3	3	3	3	0			
Cap, veh/h				0	1379	403	1438	1510	0			
Arrive On Green				0.00	0.34	0.34	0.18	0.18	0.00			
Sat Flow, veh/h				0	4189	1186	2663	2796	0			
Grp Volume(v), veh/h				0	1115	100	1051	1255	0			
Grp Sat Flow(s),veh/h/ln				0	1352	1186	1331	1398	0			
Q Serve(g_s), s				0.0	18.8	4.6	28.0	32.5	0.0			
Cycle Q Clear(g_c), s				0.0	18.8	4.6	28.0	32.5	0.0			
Prop In Lane				0.00		1.00	1.00		0.00			
Lane Grp Cap(c), veh/h				0	1379	403	1438	1510	0			
V/C Ratio(X)				0.00	0.81	0.25	0.73	0.83	0.00			
Avail Cap(c_a), veh/h				0	1379	403	1438	1510	0			
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	22.5	17.8	25.7	27.5	0.0			
Incr Delay (d2), s/veh				0.0	5.2	1.5	3.3	5.5	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	7.6	1.6	11.0	13.7	0.0			
LnGrp Delay(d),s/veh				0.0	27.7	19.3	29.0	33.0	0.0			
LnGrp LOS					C	B	C	C				
Approach Vol, veh/h					1215			2306				
Approach Delay, s/veh					27.0			31.2				
Approach LOS					C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				45.0		30.0						
Change Period (Y+Rc), s				4.5		4.5						
Max Green Setting (Gmax), s				40.5		25.5						
Max Q Clear Time (g_c+I1), s				34.5		20.8						
Green Ext Time (p_c), s				5.0		2.7						
Intersection Summary												
HCM 2010 Ctrl Delay				29.7								
HCM 2010 LOS				C								
Notes												



















HCM 2010 Signalized Intersection Summary
21: D & 2nd

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑		↑	↑	
Traffic Volume (veh/h)	0	1932	80	0	0	0	0	0	255	70	450	0
Future Volume (veh/h)	0	1932	80	0	0	0	0	0	255	70	450	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1660	1710				0	1573	1620	1748	1748	0
Adj Flow Rate, veh/h	0	2100	80				0	0	261	76	489	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	0	0	0				0	0	1126	1125	1488	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.85	0.28	0.28	0.00
Sat Flow, veh/h		0					0	0	1323	1095	1748	0
Grp Volume(v), veh/h		0.0					0	0	261	76	489	0
Grp Sat Flow(s),veh/h/ln							0	0	1323	1095	1748	0
Q Serve(g_s), s							0.0	0.0	1.1	1.6	6.9	0.0
Cycle Q Clear(g_c), s							0.0	0.0	1.1	2.7	6.9	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	1126	1125	1488	0
V/C Ratio(X)							0.00	0.00	0.23	0.07	0.33	0.00
Avail Cap(c_a), veh/h							0	0	1126	1125	1488	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(l)							0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh							0.0	0.0	0.4	3.1	4.1	0.0
Incr Delay (d2), s/veh							0.0	0.0	0.5	0.1	0.6	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	0.5	0.5	3.6	0.0
LnGrp Delay(d),s/veh							0.0	0.0	0.9	3.2	4.7	0.0
LnGrp LOS									A	A	A	
Approach Vol, veh/h								261			565	
Approach Delay, s/veh								0.9			4.5	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				31.0				31.0				
Change Period (Y+Rc), s				4.6				4.6				
Max Green Setting (Gmax), s				26.4				26.4				
Max Q Clear Time (g_c+I1), s				8.9				3.1				
Green Ext Time (p_c), s				1.4				0.7				
Intersection Summary												
HCM 2010 Ctrl Delay			3.4									
HCM 2010 LOS			A									













HCM 2010 Signalized Intersection Summary
22: C & 2nd

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						  				
Traffic Volume (veh/h)	110	2147	0	0	0	0	0	200	90	0	0	0
Future Volume (veh/h)	110	2147	0	0	0	0	0	200	90	0	0	0
Number	1	6	16				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1440	1485	0				0	1485	1440			
Adj Flow Rate, veh/h	120	2334	0				0	217	94			
Adj No. of Lanes	0	3	0				0	2	0			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0				0	3	3			
Cap, veh/h	158	2406	0				0	549	228			
Arrive On Green	0.20	0.20	0.00				0.00	0.28	0.28			
Sat Flow, veh/h	171	3975	0				0	1978	823			
Grp Volume(v), veh/h	866	1588	0				0	161	150			
Grp Sat Flow(s),veh/h/ln	1443	1352	0				0	1485	1315			
Q Serve(g_s), s	38.7	43.7	0.0				0.0	6.6	7.0			
Cycle Q Clear(g_c), s	44.9	43.7	0.0				0.0	6.6	7.0			
Prop In Lane	0.14		0.00				0.00		0.63			
Lane Grp Cap(c), veh/h	928	1637	0				0	412	365			
V/C Ratio(X)	0.93	0.97	0.00				0.00	0.39	0.41			
Avail Cap(c_a), veh/h	928	1637	0				0	412	365			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	29.7	29.3	0.0				0.0	22.0	22.1			
Incr Delay (d2), s/veh	17.3	16.2	0.0				0.0	2.8	3.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	22.4	20.1	0.0				0.0	3.0	2.9			
LnGrp Delay(d),s/veh	47.0	45.6	0.0				0.0	24.7	25.5			
LnGrp LOS	D	D						C	C			
Approach Vol, veh/h		2454						311				
Approach Delay, s/veh		46.1						25.1				
Approach LOS		D						C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				25.0		50.0						
Change Period (Y+Rc), s				* 4.2		4.6						
Max Green Setting (Gmax), s				* 21		45.4						
Max Q Clear Time (g_c+I1), s				9.0		46.9						
Green Ext Time (p_c), s				1.9		0.0						
Intersection Summary												
HCM 2010 Ctrl Delay			43.7									
HCM 2010 LOS			D									
Notes												




















HCM 2010 Signalized Intersection Summary
23: B & 2nd

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑		↑	↑	
Traffic Volume (veh/h)	0	2162	70	0	0	0	0	0	160	70	220	0
Future Volume (veh/h)	0	2162	70	0	0	0	0	0	160	70	220	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1485	1382				0	1573	1591	1545	1485	0
Adj Flow Rate, veh/h	0	2350	71				0	0	157	76	239	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	0	0	0				0	0	1077	1127	1238	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.83	0.28	0.28	0.00
Sat Flow, veh/h		0					0	0	1292	1061	1485	0
Grp Volume(v), veh/h		0.0					0	0	157	76	239	0
Grp Sat Flow(s),veh/h/ln							0	0	1292	1061	1485	0
Q Serve(g_s), s							0.0	0.0	0.6	1.5	3.3	0.0
Cycle Q Clear(g_c), s							0.0	0.0	0.6	2.1	3.3	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	1077	1127	1238	0
V/C Ratio(X)							0.00	0.00	0.15	0.07	0.19	0.00
Avail Cap(c_a), veh/h							0	0	1077	1127	1238	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(l)							0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh							0.0	0.0	0.4	2.6	2.8	0.0
Incr Delay (d2), s/veh							0.0	0.0	0.3	0.1	0.3	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	0.3	0.5	1.5	0.0
LnGrp Delay(d),s/veh							0.0	0.0	0.7	2.7	3.2	0.0
LnGrp LOS									A	A	A	
Approach Vol, veh/h								157			315	
Approach Delay, s/veh								0.7			3.1	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				27.0				27.0				
Change Period (Y+Rc), s				4.5				4.5				
Max Green Setting (Gmax), s				22.5				22.5				
Max Q Clear Time (g_c+I1), s				5.3				2.6				
Green Ext Time (p_c), s				0.7				0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			2.3									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary
24: A & 2nd

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						 				
Traffic Volume (veh/h)	90	2097	195	0	0	0	0	240	20	50	115	0
Future Volume (veh/h)	90	2097	195	0	0	0	0	240	20	50	115	0
Number	5	2	12				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96				1.00		0.96	0.98		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1748	1800				0	1660	1710	1660	1660	0
Adj Flow Rate, veh/h	98	2279	197				0	261	12	54	125	0
Adj No. of Lanes	0	3	0				0	2	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	102	2494	219				0	685	31	285	530	0
Arrive On Green	0.19	0.19	0.19				0.00	0.22	0.22	0.01	0.11	0.00
Sat Flow, veh/h	180	4423	388				0	3149	140	1581	1660	0
Grp Volume(v), veh/h	945	785	844				0	134	139	54	125	0
Grp Sat Flow(s),veh/h/ln	1739	1590	1662				0	1577	1629	1581	1660	0
Q Serve(g_s), s	40.6	36.1	37.3				0.0	5.4	5.5	0.0	5.2	0.0
Cycle Q Clear(g_c), s	40.6	36.1	37.3				0.0	5.4	5.5	0.0	5.2	0.0
Prop In Lane	0.10		0.23				0.00		0.09	1.00		0.00
Lane Grp Cap(c), veh/h	980	897	937				0	352	364	285	530	0
V/C Ratio(X)	0.96	0.87	0.90				0.00	0.38	0.38	0.19	0.24	0.00
Avail Cap(c_a), veh/h	980	897	937				0	352	364	285	530	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.9	28.0	28.5				0.0	24.8	24.8	28.6	25.2	0.0
Incr Delay (d2), s/veh	21.3	11.6	13.4				0.0	3.1	3.0	1.5	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	25.4	18.8	20.6				0.0	2.6	2.7	1.1	2.5	0.0
LnGrp Delay(d),s/veh	51.2	39.7	41.9				0.0	27.9	27.8	30.0	26.3	0.0
LnGrp LOS	D	D	D					C	C	C	C	
Approach Vol, veh/h		2574						273			179	
Approach Delay, s/veh		44.6						27.8			27.4	
Approach LOS		D						C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		47.0		28.2			7.2	21.0				
Change Period (Y+Rc), s		4.6		* 4.2			* 4.2	* 4.2				
Max Green Setting (Gmax), s		42.4		* 24			* 3	* 17				
Max Q Clear Time (g_c+I1), s		42.6		7.2			2.0	7.5				
Green Ext Time (p_c), s		0.0		0.7			0.0	1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			42.1									
HCM 2010 LOS			D									
Notes												

Intersection 25 **Brooks St/2nd St** **Side-street Stop**


















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	50	50	100.8%	19.9	7.9	C
	Through						
	Right Turn						
	Subtotal	50	50	100.8%	19.9	7.9	C
EB	Left Turn	25	22	89.8%	2.8	0.4	A
	Through	2,152	2,093	97.3%	2.6	0.2	A
	Right Turn						
	Subtotal	2,177	2,116	97.2%	2.6	0.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,227	2,166	97.3%	3.0	0.3	A

Intersection 26 **Lindaro St/2nd St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	54	54	100.2%	15.6	2.7	B
	Right Turn	261	274	104.9%	16.6	5.2	B
	Subtotal	315	328	104.1%	16.5	4.2	B
SB	Left Turn	62	60	96.7%	35.1	7.0	D
	Through	427	394	92.4%	33.4	3.2	C
	Right Turn						
	Subtotal	489	454	92.9%	33.7	3.4	C
EB	Left Turn	42	43	101.6%	13.1	3.4	B
	Through	2,134	2,074	97.2%	12.6	1.3	B
	Right Turn	61	61	100.7%	11.7	2.5	B
	Subtotal	2,237	2,178	97.4%	12.6	1.3	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,041	2,961	97.4%	16.3	1.1	B



















HCM 2010 Signalized Intersection Summary
27: Lincoln & 2nd

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	2281	41	0	0	0	0	107	50	130	255	0
Future Volume (veh/h)	135	2281	41	0	0	0	0	107	50	130	255	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1398	1398				0	1398	1398	1382	1342	0
Adj Flow Rate, veh/h	147	2479	23				0	116	42	141	277	0
Adj No. of Lanes	0	4	1				0	1	1	0	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	139	2511	598				0	500	411	283	541	0
Arrive On Green	0.18	0.18	0.18				0.00	0.36	0.36	0.12	0.12	0.00
Sat Flow, veh/h	261	4731	1126				0	1398	1151	570	1574	0
Grp Volume(v), veh/h	780	1846	23				0	116	42	215	203	0
Grp Sat Flow(s),veh/h/ln	1385	1202	1126				0	1398	1151	923	1160	0
Q Serve(g_s), s	39.8	38.1	1.3				0.0	4.4	1.8	13.6	12.3	0.0
Cycle Q Clear(g_c), s	39.8	38.1	1.3				0.0	4.4	1.8	17.9	12.3	0.0
Prop In Lane	0.19		1.00				0.00		1.00	0.66		0.00
Lane Grp Cap(c), veh/h	735	1914	598				0	500	411	409	415	0
V/C Ratio(X)	1.06	0.96	0.04				0.00	0.23	0.10	0.53	0.49	0.00
Avail Cap(c_a), veh/h	735	1914	598				0	500	411	409	415	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.9	30.2	15.0				0.0	16.9	16.1	30.3	26.7	0.0
Incr Delay (d2), s/veh	50.6	13.7	0.1				0.0	1.1	0.5	4.8	4.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	25.6	15.1	0.4				0.0	1.8	0.6	4.8	4.4	0.0
LnGrp Delay(d),s/veh	81.6	44.0	15.2				0.0	18.0	16.6	35.1	30.8	0.0
LnGrp LOS	F	D	B					B	B	D	C	
Approach Vol, veh/h		2649						158			418	
Approach Delay, s/veh		54.8						17.6			33.0	
Approach LOS		D						B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		44.0		31.0				31.0				
Change Period (Y+Rc), s		* 4.2		* 4.2				* 4.2				
Max Green Setting (Gmax), s		* 40		* 27				* 27				
Max Q Clear Time (g_c+I1), s		41.8		6.4				19.9				
Green Ext Time (p_c), s		0.0		0.6				1.0				
Intersection Summary												
HCM 2010 Ctrl Delay			50.1									
HCM 2010 LOS			D									
Notes												

















HCM 2010 Signalized Intersection Summary
 28: Francisco W./Tamalpais & 2nd

Baseline Plus Project Buildout
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	2336	60	0	0	0	0	50	250	110	180	0
Future Volume (veh/h)	50	2336	60	0	0	0	0	50	250	110	180	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1398	1398				0	1398	1454	1398	1398	0
Adj Flow Rate, veh/h	54	2539	39				0	54	233	120	196	0
Adj No. of Lanes	0	4	1				0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	58	2940	651				0	317	273	265	317	0
Arrive On Green	0.20	0.20	0.20				0.00	0.23	0.23	0.07	0.07	0.00
Sat Flow, veh/h	97	4903	1086				0	1398	1203	862	1398	0
Grp Volume(v), veh/h	773	1820	39				0	54	233	120	196	0
Grp Sat Flow(s),veh/h/ln	1393	1202	1086				0	1398	1203	862	1398	0
Q Serve(g_s), s	40.9	36.4	2.2				0.0	2.3	13.9	10.2	10.2	0.0
Cycle Q Clear(g_c), s	40.9	36.4	2.2				0.0	2.3	13.9	12.6	10.2	0.0
Prop In Lane	0.07		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	835	2163	651				0	317	273	265	317	0
V/C Ratio(X)	0.93	0.84	0.06				0.00	0.17	0.85	0.45	0.62	0.00
Avail Cap(c_a), veh/h	835	2163	651				0	569	489	420	569	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	0.09	0.09	0.09				0.00	1.00	1.00	0.97	0.97	0.00
Uniform Delay (d), s/veh	28.4	26.7	12.9				0.0	23.3	27.8	33.8	31.5	0.0
Incr Delay (d2), s/veh	2.2	0.4	0.0				0.0	0.3	7.4	1.2	1.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.3	12.2	0.7				0.0	0.9	5.2	2.5	4.1	0.0
LnGrp Delay(d),s/veh	30.7	27.0	12.9				0.0	23.6	35.2	34.9	33.4	0.0
LnGrp LOS	C	C	B					C	D	C	C	
Approach Vol, veh/h		2632						287			316	
Approach Delay, s/veh		27.9						33.0			34.0	
Approach LOS		C						C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		51.5		23.5				23.5				
Change Period (Y+Rc), s		6.5		6.5				6.5				
Max Green Setting (Gmax), s		31.5		30.5				30.5				
Max Q Clear Time (g_c+I1), s		42.9		15.9				14.6				
Green Ext Time (p_c), s		0.0		1.1				1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			29.0									
HCM 2010 LOS			C									





















HCM 2010 Signalized Intersection Summary
 29: 101 SBO n 2nd/Hetherton & 2nd/2nd St

Baseline Plus Project Buildout
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1175	1361	0	0	0	0	0	0	195	975	0
Future Volume (veh/h)	0	1175	1361	0	0	0	0	0	0	195	975	0
Number	5	2	12							7	4	14
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1485	1485							1485	1485	0
Adj Flow Rate, veh/h	0	1277	1454							212	1060	0
Adj No. of Lanes	0	3	2							1	2	0
Peak Hour Factor	0.92	0.92	0.92							0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3							3	3	0
Cap, veh/h	0	2050	1162							519	1089	0
Arrive On Green	0.00	0.15	0.15							0.12	0.12	0.00
Sat Flow, veh/h	0	4456	2525							1415	2971	0
Grp Volume(v), veh/h	0	1277	1454							212	1060	0
Grp Sat Flow(s),veh/h/ln	0	1485	1263							1415	1485	0
Q Serve(g_s), s	0.0	20.1	34.5							10.4	26.7	0.0
Cycle Q Clear(g_c), s	0.0	20.1	34.5							10.4	26.7	0.0
Prop In Lane	0.00		1.00							1.00		0.00
Lane Grp Cap(c), veh/h	0	2050	1162							519	1089	0
V/C Ratio(X)	0.00	0.62	1.25							0.41	0.97	0.00
Avail Cap(c_a), veh/h	0	2050	1162							519	1089	0
HCM Platoon Ratio	1.00	0.33	0.33							0.33	0.33	1.00
Upstream Filter(l)	0.00	0.11	0.11							0.81	0.81	0.00
Uniform Delay (d), s/veh	0.0	25.7	31.8							25.4	32.6	0.0
Incr Delay (d2), s/veh	0.0	0.2	114.1							0.4	18.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.3	30.5							4.1	13.8	0.0
LnGrp Delay(d),s/veh	0.0	25.9	145.9							25.9	51.0	0.0
LnGrp LOS		C	F							C	D	
Approach Vol, veh/h		2731									1272	
Approach Delay, s/veh		89.8									46.8	
Approach LOS		F									D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		43.0		32.0								
Change Period (Y+Rc), s		8.5		4.5								
Max Green Setting (Gmax), s		34.5		27.5								
Max Q Clear Time (g_c+I1), s		36.5		28.7								
Green Ext Time (p_c), s		0.0		0.0								
Intersection Summary												
HCM 2010 Ctrl Delay			76.1									
HCM 2010 LOS			E									
Notes												





















HCM 2010 Signalized Intersection Summary
30: Irwin & 2nd St

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						  				
Traffic Volume (veh/h)	725	815	0	0	0	0	0	1407	460	0	0	0
Future Volume (veh/h)	725	815	0	0	0	0	0	1407	460	0	0	0
Number	5	2	12				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1454	1485	0				0	1398	1398			
Adj Flow Rate, veh/h	788	886	0				0	1529	450			
Adj No. of Lanes	2	2	0				0	3	1			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0				0	3	3			
Cap, veh/h	1440	1339	0				0	1618	499			
Arrive On Green	0.15	0.15	0.00				0.00	0.42	0.42			
Sat Flow, veh/h	2769	2971	0				0	3943	1176			
Grp Volume(v), veh/h	788	886	0				0	1529	450			
Grp Sat Flow(s),veh/h/ln	1385	1485	0				0	1272	1176			
Q Serve(g_s), s	20.0	21.1	0.0				0.0	28.9	26.8			
Cycle Q Clear(g_c), s	20.0	21.1	0.0				0.0	28.9	26.8			
Prop In Lane	1.00		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	1440	1339	0				0	1618	499			
V/C Ratio(X)	0.55	0.66	0.00				0.00	0.94	0.90			
Avail Cap(c_a), veh/h	1440	1339	0				0	1618	499			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	26.1	26.5	0.0				0.0	20.8	20.2			
Incr Delay (d2), s/veh	1.5	2.6	0.0				0.0	12.6	22.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.0	9.2	0.0				0.0	11.9	11.7			
LnGrp Delay(d),s/veh	27.6	29.1	0.0				0.0	33.4	42.4			
LnGrp LOS	C	C						C	D			
Approach Vol, veh/h		1674						1979				
Approach Delay, s/veh		28.4						35.4				
Approach LOS		C						D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		38.0		37.0								
Change Period (Y+Rc), s		* 4.2		* 5.2								
Max Green Setting (Gmax), s		* 34		* 32								
Max Q Clear Time (g_c+I1), s		23.1		30.9								
Green Ext Time (p_c), s		8.8		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay			32.2									
HCM 2010 LOS			C									
Notes												

HCM 2010 Signalized Intersection Summary
31: Lindaro & Andersen

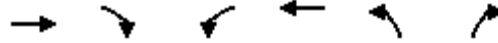
Baseline Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	20	310	50	5	80	210	64	50	280	150	61	202
Future Volume (veh/h)	20	310	50	5	80	210	64	50	280	150	61	202
Number	5	2	12		1	6	16	3	8	18	7	4
Initial Q (Qb), veh	0	0	0		0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94		1.00		0.97	1.00		0.97	1.00	
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	2019	2019	2000		1942	1942	2000	1845	1845	1900	1845	1845
Adj Flow Rate, veh/h	22	337	46		87	228	57	54	304	139	66	220
Adj No. of Lanes	1	1	0		1	1	0	1	1	0	1	1
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
Percent Heavy Veh, %	3	3	3		3	3	3	3	3	3	3	3
Cap, veh/h	58	420	57		158	445	111	152	369	169	170	537
Arrive On Green	0.03	0.24	0.24		0.09	0.30	0.30	0.09	0.31	0.31	0.10	0.32
Sat Flow, veh/h	1923	1726	236		1849	1490	373	1757	1186	542	1757	1669
Grp Volume(v), veh/h	22	0	383		87	0	285	54	0	443	66	0
Grp Sat Flow(s),veh/h/ln	1923	0	1961		1849	0	1863	1757	0	1728	1757	0
Q Serve(g_s), s	0.7	0.0	11.9		2.9	0.0	8.2	1.9	0.0	15.4	2.3	0.0
Cycle Q Clear(g_c), s	0.7	0.0	11.9		2.9	0.0	8.2	1.9	0.0	15.4	2.3	0.0
Prop In Lane	1.00		0.12		1.00		0.20	1.00		0.31	1.00	
Lane Grp Cap(c), veh/h	58	0	477		158	0	556	152	0	538	170	0
V/C Ratio(X)	0.38	0.00	0.80		0.55	0.00	0.51	0.36	0.00	0.82	0.39	0.00
Avail Cap(c_a), veh/h	237	0	668		285	0	692	244	0	714	244	0
HCM Platoon Ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00		1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.9	0.0	23.1		28.5	0.0	18.9	27.9	0.0	20.7	27.5	0.0
Incr Delay (d2), s/veh	1.5	0.0	4.8		1.1	0.0	0.7	0.5	0.0	5.9	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	7.0		1.5	0.0	4.3	0.9	0.0	8.1	1.1	0.0
LnGrp Delay(d),s/veh	32.4	0.0	27.9		29.6	0.0	19.6	28.5	0.0	26.6	28.1	0.0
LnGrp LOS	C		C		C		B	C		C	C	
Approach Vol, veh/h		405				372			497			304
Approach Delay, s/veh		28.2				21.9			26.8			19.9
Approach LOS		C				C			C			B
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.5	20.7	9.6	25.1	6.0	24.3	10.3	24.4				
Change Period (Y+Rc), s	4.0	4.9	4.0	* 4.2	4.0	4.9	4.0	* 4.2				
Max Green Setting (Gmax), s	10.0	22.1	9.0	* 27	8.0	24.1	9.0	* 27				
Max Q Clear Time (g_c+I1), s	4.9	13.9	3.9	8.7	2.7	10.2	4.3	17.4				
Green Ext Time (p_c), s	0.1	1.1	0.0	0.9	0.0	0.9	0.0	1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			24.7									
HCM 2010 LOS			C									
Notes												

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	20
Future Volume (veh/h)	20
Number	14
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	0.91
Parking Bus, Adj	1.00
Adj Sat Flow, veh/h/ln	1900
Adj Flow Rate, veh/h	18
Adj No. of Lanes	0
Peak Hour Factor	0.92
Percent Heavy Veh, %	3
Cap, veh/h	44
Arrive On Green	0.32
Sat Flow, veh/h	137
Grp Volume(v), veh/h	238
Grp Sat Flow(s),veh/h/ln	1806
Q Serve(g_s), s	6.7
Cycle Q Clear(g_c), s	6.7
Prop In Lane	0.08
Lane Grp Cap(c), veh/h	581
V/C Ratio(X)	0.41
Avail Cap(c_a), veh/h	746
HCM Platoon Ratio	1.00
Upstream Filter(l)	1.00
Uniform Delay (d), s/veh	17.2
Incr Delay (d2), s/veh	0.5
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	3.4
LnGrp Delay(d),s/veh	17.7
LnGrp LOS	B
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	

HCM Signalized Intersection Capacity Analysis
 32: Tamalpais & Mission

Baseline Plus Project Buildout
 Timing Plan: AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	
Traffic Volume (vph)	545	25	0	690	25	5
Future Volume (vph)	545	25	0	690	25	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.6			3.0	5.2	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	0.98	
Frt	0.99			1.00	0.98	
Flt Protected	1.00			1.00	0.96	
Satd. Flow (prot)	1560			1573	1441	
Flt Permitted	1.00			1.00	0.96	
Satd. Flow (perm)	1560			1573	1441	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	592	27	0	750	27	5
RTOR Reduction (vph)	2	0	0	0	4	0
Lane Group Flow (vph)	617	0	0	750	28	0
Confl. Peds. (#/hr)		10	10		10	
Turn Type	NA			NA	Perm	
Protected Phases	2			3 4 6		
Permitted Phases					8	
Actuated Green, G (s)	30.1			51.2	13.4	
Effective Green, g (s)	30.1			45.6	13.4	
Actuated g/C Ratio	0.40			0.61	0.18	
Clearance Time (s)	5.6				5.2	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	626			956	257	
v/s Ratio Prot	c0.40			c0.48		
v/s Ratio Perm					c0.02	
v/c Ratio	0.98			0.78	0.11	
Uniform Delay, d1	22.2			11.0	25.8	
Progression Factor	0.78			0.69	1.05	
Incremental Delay, d2	28.6			0.4	0.2	
Delay (s)	46.0			7.9	27.3	
Level of Service	D			A	C	
Approach Delay (s)	46.0			7.9	27.3	
Approach LOS	D			A	C	

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
33: Tamalpais & 5th

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Traffic Volume (vph)	0	365	20	0	330	50	10	10	10	5	25	20
Future Volume (vph)	0	365	20	0	330	50	10	10	10	5	25	20
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.6			5.6			5.6			5.6	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			0.99			1.00			0.98	
Flpb, ped/bikes		1.00			1.00			0.99			1.00	
Frt		0.99			0.98			0.95			0.94	
Flt Protected		1.00			1.00			0.98			1.00	
Satd. Flow (prot)		1558			1536			1466			1452	
Flt Permitted		1.00			1.00			0.87			0.97	
Satd. Flow (perm)		1558			1536			1293			1409	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	397	22	0	359	54	11	11	11	5	27	22
RTOR Reduction (vph)	0	2	0	0	5	0	0	10	0	0	20	0
Lane Group Flow (vph)	0	417	0	0	408	0	0	23	0	0	34	0
Confl. Peds. (#/hr)	10		10	10		10	10					10
Turn Type		NA			NA		Perm	NA		Perm	NA	
Protected Phases		2			4	6		8			8	
Permitted Phases							8			8		
Actuated Green, G (s)		39.8			56.0			7.8			7.8	
Effective Green, g (s)		39.8			56.0			7.8			7.8	
Actuated g/C Ratio		0.53			0.75			0.10			0.10	
Clearance Time (s)		5.6						5.6			5.6	
Vehicle Extension (s)		3.0						1.5			1.5	
Lane Grp Cap (vph)		826			1146			134			146	
v/s Ratio Prot		c0.27			c0.27							
v/s Ratio Perm								0.02			c0.02	
v/c Ratio		0.50			0.36			0.17			0.23	
Uniform Delay, d1		11.3			3.3			30.7			30.9	
Progression Factor		0.72			0.06			0.63			0.83	
Incremental Delay, d2		1.7			0.1			0.2			0.3	
Delay (s)		9.8			0.3			19.4			25.9	
Level of Service		A			A			B			C	
Approach Delay (s)		9.8			0.3			19.4			25.9	
Approach LOS		A			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 34: Tamalpais & Mission

Baseline Plus Project Buildout
 Timing Plan: AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Traffic Volume (vph)	550	0	0	685	5	20
Future Volume (vph)	550	0	0	685	5	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.6			5.6	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.89	
Flt Protected	1.00			1.00	0.99	
Satd. Flow (prot)	1573			1573	1387	
Flt Permitted	1.00			1.00	0.99	
Satd. Flow (perm)	1573			1573	1387	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	598	0	0	745	5	22
RTOR Reduction (vph)	0	0	0	0	17	0
Lane Group Flow (vph)	598	0	0	745	10	0
Confl. Peds. (#/hr)		10				
Turn Type	NA			NA	Prot	
Protected Phases	2 8			6	3 4	
Permitted Phases						
Actuated Green, G (s)	48.7			30.1	15.5	
Effective Green, g (s)	43.5			30.1	15.5	
Actuated g/C Ratio	0.58			0.40	0.21	
Clearance Time (s)				5.6		
Vehicle Extension (s)				3.0		
Lane Grp Cap (vph)	912			631	286	
v/s Ratio Prot	c0.38			c0.47	c0.01	
v/s Ratio Perm						
v/c Ratio	0.66			1.18	0.03	
Uniform Delay, d1	10.7			22.4	23.8	
Progression Factor	0.61			1.15	0.81	
Incremental Delay, d2	0.5			88.9	0.0	
Delay (s)	7.0			114.6	19.3	
Level of Service	A			F	B	
Approach Delay (s)	7.0			114.6	19.3	
Approach LOS	A			F	B	

Intersection Summary			
HCM 2000 Control Delay	65.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

35: Tamalpais & 5th

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑			↑			↑					
Traffic Volume (vph)	0	380	0	0	340	20	40	5	25	0	0	0	
Future Volume (vph)	0	380	0	0	340	20	40	5	25	0	0	0	
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Total Lost time (s)		5.6			5.6			5.6					
Lane Util. Factor		1.00			1.00			1.00					
Frbp, ped/bikes		1.00			1.00			0.98					
Flpb, ped/bikes		1.00			1.00			1.00					
Frt		1.00			0.99			0.95					
Flt Protected		1.00			1.00			0.97					
Satd. Flow (prot)		1573			1557			1431					
Flt Permitted		1.00			1.00			0.97					
Satd. Flow (perm)		1573			1557			1431					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	413	0	0	370	22	43	5	27	0	0	0	
RTOR Reduction (vph)	0	0	0	0	2	0	0	23	0	0	0	0	
Lane Group Flow (vph)	0	413	0	0	390	0	0	52	0	0	0	0	
Confl. Peds. (#/hr)	10					10			10				
Turn Type		NA			NA		Split	NA					
Protected Phases		2 8			6		4	4					
Permitted Phases													
Actuated Green, G (s)		53.2			39.8			10.6					
Effective Green, g (s)		53.2			39.8			10.6					
Actuated g/C Ratio		0.71			0.53			0.14					
Clearance Time (s)					5.6			5.6					
Vehicle Extension (s)					3.0			1.5					
Lane Grp Cap (vph)		1115			826			202					
v/s Ratio Prot		c0.26			c0.25			c0.04					
v/s Ratio Perm													
v/c Ratio		0.37			0.47			0.26					
Uniform Delay, d1		4.3			11.0			28.7					
Progression Factor		0.01			0.51			1.27					
Incremental Delay, d2		0.1			1.8			0.2					
Delay (s)		0.1			7.4			36.5					
Level of Service		A			A			D					
Approach Delay (s)		0.1			7.4			36.5			0.0		
Approach LOS		A			A			D			A		
Intersection Summary													
HCM 2000 Control Delay			6.5									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.43										
Actuated Cycle Length (s)			75.0									Sum of lost time (s)	16.8
Intersection Capacity Utilization			39.8%									ICU Level of Service	A
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
36: Tamalpais & 4th

Baseline Plus Project Buildout
Timing Plan: AM Peak Hour






















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑			↑				
Traffic Volume (vph)	0	410	0	0	405	75	10	5	10	0	0	0
Future Volume (vph)	0	410	0	0	405	75	10	5	10	0	0	0
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.6			5.6			5.6				
Lane Util. Factor		1.00			1.00			1.00				
Frbp, ped/bikes		1.00			0.98			0.99				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.98			0.94				
Flt Protected		1.00			1.00			0.98				
Satd. Flow (prot)		1573			1512			1441				
Flt Permitted		1.00			1.00			0.98				
Satd. Flow (perm)		1573			1512			1441				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	446	0	0	440	82	11	5	11	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	9	0	0	0	0
Lane Group Flow (vph)	0	446	0	0	514	0	0	18	0	0	0	0
Confl. Peds. (#/hr)	39		22			39			10			
Turn Type		NA			NA		Split	NA				
Protected Phases		2 8			6		4	4				
Permitted Phases												
Actuated Green, G (s)		50.7			32.7			13.5				
Effective Green, g (s)		50.7			32.7			13.5				
Actuated g/C Ratio		0.68			0.44			0.18				
Clearance Time (s)					5.6			5.6				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)		1063			659			259				
v/s Ratio Prot		c0.28			c0.34			c0.01				
v/s Ratio Perm												
v/c Ratio		0.42			0.78			0.07				
Uniform Delay, d1		5.5			18.1			25.5				
Progression Factor		0.06			0.94			1.01				
Incremental Delay, d2		0.3			7.9			0.1				
Delay (s)		0.6			24.9			25.9				
Level of Service		A			C			C				
Approach Delay (s)		0.6			24.9			25.9			0.0	
Approach LOS		A			C			C			A	
Intersection Summary												
HCM 2000 Control Delay			14.0				HCM 2000 Level of Service		B			
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			75.0				Sum of lost time (s)		16.4			
Intersection Capacity Utilization			49.2%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
1: Lincoln & Mission

Baseline Plus Project Buildout

10/01/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	260	465	20	50	530	70	10	491	50	0	361	300
Future Volume (veh/h)	260	465	20	50	530	70	10	491	50	0	361	300
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.93	1.00		0.95
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1676	1676	1710	1676	1676	1710	1800	1694	1728	0	1765	1728
Adj Flow Rate, veh/h	271	484	19	52	552	67	10	511	43	0	376	116
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	0	2	2
Cap, veh/h	180	941	37	435	640	78	53	1123	93	0	968	294
Arrive On Green	0.11	0.59	0.59	0.87	0.87	0.87	0.77	0.77	0.77	0.00	0.39	0.39
Sat Flow, veh/h	1597	1601	63	844	1463	178	18	2898	240	0	2587	758
Grp Volume(v), veh/h	271	0	503	52	0	619	299	0	265	0	250	242
Grp Sat Flow(s),veh/h/ln	1597	0	1664	844	0	1640	1677	0	1479	0	1676	1581
Q Serve(g_s), s	9.0	0.0	14.3	1.0	0.0	15.4	0.0	0.0	5.0	0.0	8.6	8.9
Cycle Q Clear(g_c), s	9.0	0.0	14.3	3.3	0.0	15.4	4.9	0.0	5.0	0.0	8.6	8.9
Prop In Lane	1.00		0.04	1.00		0.11	0.03		0.16	0.00		0.48
Lane Grp Cap(c), veh/h	180	0	978	435	0	718	696	0	573	0	650	612
V/C Ratio(X)	1.51	0.00	0.51	0.12	0.00	0.86	0.43	0.00	0.46	0.00	0.38	0.40
Avail Cap(c_a), veh/h	180	0	978	435	0	718	696	0	573	0	650	612
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.81	0.00	0.81	0.81	0.00	0.81	0.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	0.0	9.8	3.3	0.0	3.8	6.1	0.0	6.1	0.0	17.6	17.7
Incr Delay (d2), s/veh	255.5	0.0	1.9	0.5	0.0	10.9	1.6	0.0	2.2	0.0	1.7	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.7	0.0	7.1	0.3	0.0	8.0	2.5	0.0	2.2	0.0	4.3	4.2
LnGrp Delay(d),s/veh	291.0	0.0	11.7	3.7	0.0	14.6	7.6	0.0	8.2	0.0	19.4	19.6
LnGrp LOS	F		B	A		B	A		A		B	B
Approach Vol, veh/h		774			671			564			492	
Approach Delay, s/veh		109.5			13.8			7.9			19.5	
Approach LOS		F			B			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		51.2		35.8	12.0	39.2		35.8				
Change Period (Y+Rc), s		* 4.2		4.6	3.0	* 4.2		4.6				
Max Green Setting (Gmax), s		* 47		24.4	9.0	* 35		24.4				
Max Q Clear Time (g_c+I1), s		16.3		7.0	11.0	17.4		10.9				
Green Ext Time (p_c), s		5.4		4.6	0.0	6.3		3.5				
Intersection Summary												
HCM 2010 Ctrl Delay			43.2									
HCM 2010 LOS			D									
Notes												

HCM Signalized Intersection Capacity Analysis

2: Hetherton & Mission

Baseline Plus Project Buildout

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑						↑↑	↑
Traffic Volume (vph)	0	490	50	40	175	0	0	0	0	230	1173	450
Future Volume (vph)	0	490	50	40	175	0	0	0	0	230	1173	450
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	10	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		0.95			1.00						0.95	1.00
Frbp, ped/bikes		1.00			1.00						1.00	0.98
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.99			1.00						1.00	0.85
Flt Protected		1.00			0.99						0.99	1.00
Satd. Flow (prot)		2769			1781						2993	1321
Flt Permitted		1.00			0.85						0.99	1.00
Satd. Flow (perm)		2769			1520						2993	1321
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	510	52	42	182	0	0	0	0	240	1222	469
RTOR Reduction (vph)	0	10	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	552	0	0	224	0	0	0	0	0	1462	469
Confl. Peds. (#/hr)			15	15		4			11			
Confl. Bikes (#/hr)			3			3			3			2
Turn Type		NA		Perm	NA					Split	NA	custom
Protected Phases		4			8					2	2	
Permitted Phases				8								5
Actuated Green, G (s)		30.8			30.8						40.4	33.4
Effective Green, g (s)		30.8			30.8						40.4	33.4
Actuated g/C Ratio		0.39			0.39						0.50	0.42
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		1066			585						1511	551
v/s Ratio Prot		c0.20									c0.49	
v/s Ratio Perm					0.15							0.36
v/c Ratio		0.52			0.38						0.97	0.85
Uniform Delay, d1		18.9			17.7						19.2	21.1
Progression Factor		0.34			0.36						1.00	1.00
Incremental Delay, d2		1.6			1.6						16.6	15.2
Delay (s)		8.1			7.9						35.8	36.3
Level of Service		A			A						D	D
Approach Delay (s)		8.1			7.9			0.0			35.9	
Approach LOS		A			A			A			D	
Intersection Summary												
HCM 2000 Control Delay			27.8		HCM 2000 Level of Service					C		
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				10.8			
Intersection Capacity Utilization			96.2%		ICU Level of Service				F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Irwin & Mission

Baseline Plus Project Buildout



















10/01/2018



Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2	
Lane Configurations											
Traffic Volume (vph)	395	20	305	135	300	20	75	1525	190	50	
Future Volume (vph)	395	20	305	135	300	20	75	1525	190	50	
Ideal Flow (vphpl)	2200	1800	2200	2200	2200	1800	2200	2200	1800	2200	
Lane Width	9	12	10	10	9	12	12	12	12	12	
Total Lost time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Lane Util. Factor		1.00	1.00	1.00	1.00			0.95	1.00		
Frbp, ped/bikes		1.00	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		
Frt		1.00	1.00	1.00	0.85			1.00	0.85		
Flt Protected		0.95	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (prot)		1509	1812	1812	1485			3677	1316		
Flt Permitted		0.63	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (perm)		1000	1812	1812	1485			3677	1316		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	411	21	318	141	312	21	78	1589	198	52	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	38	0	
Lane Group Flow (vph)	0	432	318	141	334	0	0	1667	212	0	
Confl. Peds. (#/hr)							8			3	
Confl. Bikes (#/hr)					4	4					
Turn Type	pm+pt	pm+pt	NA	NA	Prot		Perm	NA	Perm		
Protected Phases	5	5	2	6	6			4			
Permitted Phases	2	2					4			4	
Actuated Green, G (s)		32.8	32.8	16.8	16.8			38.8	38.8		
Effective Green, g (s)		32.8	32.8	16.8	16.8			38.8	38.8		
Actuated g/C Ratio		0.41	0.41	0.21	0.21			0.48	0.48		
Clearance Time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Lane Grp Cap (vph)		485	742	380	311			1783	638		
v/s Ratio Prot		c0.13	0.18	0.08	c0.22						
v/s Ratio Perm		0.23						0.45	0.16		
v/c Ratio		0.89	0.43	0.37	1.07			0.93	0.33		
Uniform Delay, d1		21.7	16.9	27.1	31.6			19.4	12.6		
Progression Factor		0.72	0.75	1.00	1.00			0.44	0.23		
Incremental Delay, d2		16.7	1.3	2.8	72.1			6.8	0.8		
Delay (s)		32.4	14.0	29.8	103.7			15.4	3.7		
Level of Service		C	B	C	F			B	A		
Approach Delay (s)			24.6	81.8				13.9			
Approach LOS			C	F				B			
Intersection Summary											
HCM 2000 Control Delay			26.7							HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.98								
Actuated Cycle Length (s)			80.0							Sum of lost time (s)	12.6
Intersection Capacity Utilization			99.2%							ICU Level of Service	F
Analysis Period (min)			15								
c Critical Lane Group											

HCM 2010 Signalized Intersection Summary
4: Lincoln & 5th

Baseline Plus Project Buildout
10/01/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	370	40	30	250	50	40	421	50	60	331	40
Future Volume (veh/h)	80	370	40	30	250	50	40	421	50	60	331	40
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	1.00		0.98	0.98		0.92	0.98		0.92
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1412	1560	1530	1412	1500	1530	1440	1500	1469	1440	1500	1469
Adj Flow Rate, veh/h	83	385	37	31	260	43	42	439	42	62	345	32
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	520	706	68	333	632	104	104	888	83	159	778	73
Arrive On Green	0.50	0.50	0.50	1.00	1.00	1.00	0.76	0.76	0.76	0.76	0.76	0.76
Sat Flow, veh/h	852	1398	134	768	1251	207	137	2338	219	267	2048	191
Grp Volume(v), veh/h	83	0	422	31	0	303	272	0	251	220	0	219
Grp Sat Flow(s),veh/h/ln	852	0	1532	768	0	1457	1389	0	1305	1193	0	1313
Q Serve(g_s), s	4.3	0.0	15.1	1.3	0.0	0.0	0.0	0.0	6.0	0.6	0.0	4.8
Cycle Q Clear(g_c), s	4.3	0.0	15.1	16.4	0.0	0.0	5.5	0.0	6.0	6.5	0.0	4.8
Prop In Lane	1.00		0.09	1.00		0.14	0.15		0.17	0.28		0.15
Lane Grp Cap(c), veh/h	520	0	774	333	0	736	580	0	496	511	0	499
V/C Ratio(X)	0.16	0.00	0.55	0.09	0.00	0.41	0.47	0.00	0.51	0.43	0.00	0.44
Avail Cap(c_a), veh/h	520	0	774	333	0	736	580	0	496	511	0	499
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.97	0.00	0.97	0.84	0.00	0.84	0.75	0.00	0.75
Uniform Delay (d), s/veh	10.9	0.0	13.5	3.0	0.0	0.0	6.6	0.0	6.7	6.4	0.0	6.5
Incr Delay (d2), s/veh	0.7	0.0	2.8	0.5	0.0	1.7	2.3	0.0	3.1	2.0	0.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	6.9	0.3	0.0	0.3	2.5	0.0	2.4	1.9	0.0	1.9
LnGrp Delay(d),s/veh	11.5	0.0	16.3	3.6	0.0	1.7	8.9	0.0	9.8	8.4	0.0	8.6
LnGrp LOS	B		B	A		A	A		A	A		A
Approach Vol, veh/h		505			334			523			439	
Approach Delay, s/veh		15.5			1.8			9.3			8.5	
Approach LOS		B			A			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		45.0		35.0		45.0		35.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		40.4		30.4		40.4		30.4				
Max Q Clear Time (g_c+I1), s		17.1		8.0		18.4		8.5				
Green Ext Time (p_c), s		2.5		2.3		1.5		2.0				
Intersection Summary												
HCM 2010 Ctrl Delay			9.5									
HCM 2010 LOS			A									

HCM Signalized Intersection Capacity Analysis

5: Hetherton & 5th

Baseline Plus Project Buildout

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻			↻						↻↻↻	↻
Traffic Volume (vph)	0	325	180	60	170	0	0	0	0	50	1083	130
Future Volume (vph)	0	325	180	60	170	0	0	0	0	50	1083	130
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		1.00			1.00						0.91	1.00
Frbp, ped/bikes		0.99			1.00						1.00	0.96
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.95			1.00						1.00	0.85
Flt Protected		1.00			0.99						1.00	1.00
Satd. Flow (prot)		1697			1775						4163	1148
Flt Permitted		1.00			0.67						1.00	1.00
Satd. Flow (perm)		1697			1213						4163	1148
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	339	188	62	177	0	0	0	0	52	1128	135
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	509	0	0	240	0	0	0	0	0	1180	135
Confl. Peds. (#/hr)	12		12	12		12			12	12		7
Confl. Bikes (#/hr)			6			4			2			2
Parking (#/hr)											2	2
Turn Type		NA		Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases				8						2		5
Actuated Green, G (s)		35.8			35.8						35.4	28.4
Effective Green, g (s)		35.8			35.8						35.4	28.4
Actuated g/C Ratio		0.45			0.45						0.44	0.35
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		759			542						1842	407
v/s Ratio Prot		c0.30										
v/s Ratio Perm					0.20						0.28	0.12
v/c Ratio		0.67			0.44						0.64	0.33
Uniform Delay, d1		17.4			15.2						17.4	18.9
Progression Factor		0.32			1.00						0.35	0.43
Incremental Delay, d2		4.4			2.1						0.6	0.8
Delay (s)		10.1			17.3						6.7	9.0
Level of Service		B			B						A	A
Approach Delay (s)		10.1			17.3			0.0			6.9	
Approach LOS		B			B			A			A	


















Intersection Summary

HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



















HCM 2010 Signalized Intersection Summary
6: Irwin & 5th

Baseline Plus Project Buildout
10/01/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	150	0	0	130	110	90	1470	20	0	0	0
Future Volume (veh/h)	245	150	0	0	130	110	90	1470	20	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.96			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1588	1588	0	0	1588	1620	1620	1588	1620			
Adj Flow Rate, veh/h	255	156	0	0	135	107	94	1531	19			
Adj No. of Lanes	1	1	0	0	1	0	0	3	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	2	0	2	0			
Cap, veh/h	358	643	0	0	285	226	119	2062	26			
Arrive On Green	0.68	0.68	0.00	0.00	0.41	0.41	0.16	0.16	0.16			
Sat Flow, veh/h	1015	1588	0	0	703	557	247	4295	55			
Grp Volume(v), veh/h	255	156	0	0	0	242	599	500	545			
Grp Sat Flow(s),veh/h/ln	1015	1588	0	0	0	1260	1576	1445	1576			
Q Serve(g_s), s	19.4	3.0	0.0	0.0	0.0	11.3	29.3	26.3	26.3			
Cycle Q Clear(g_c), s	30.7	3.0	0.0	0.0	0.0	11.3	29.3	26.3	26.3			
Prop In Lane	1.00		0.00	0.00		0.44	0.16		0.03			
Lane Grp Cap(c), veh/h	358	643	0	0	0	510	756	694	757			
V/C Ratio(X)	0.71	0.24	0.00	0.00	0.00	0.47	0.79	0.72	0.72			
Avail Cap(c_a), veh/h	358	643	0	0	0	510	756	694	757			
HCM Platoon Ratio	1.67	1.67	1.00	1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	18.1	8.2	0.0	0.0	0.0	17.5	29.8	28.6	28.6			
Incr Delay (d2), s/veh	11.5	0.9	0.0	0.0	0.0	3.1	8.3	6.4	5.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.5	1.5	0.0	0.0	0.0	4.3	14.5	11.7	12.7			
LnGrp Delay(d),s/veh	29.6	9.1	0.0	0.0	0.0	20.7	38.1	34.9	34.4			
LnGrp LOS	C	A				C	D	C	C			
Approach Vol, veh/h		411			242			1644				
Approach Delay, s/veh		21.8			20.7			35.9				
Approach LOS		C			C			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		37.0		43.0		37.0						
Change Period (Y+Rc), s		4.6		4.6		4.6						
Max Green Setting (Gmax), s		32.4		38.4		32.4						
Max Q Clear Time (g_c+I1), s		32.7		31.3		13.3						
Green Ext Time (p_c), s		0.0		4.3		1.0						
Intersection Summary												
HCM 2010 Ctrl Delay				31.8								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary
7: Lincoln & 4th

Baseline Plus Project Buildout
10/01/2018

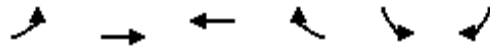
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	230	40	105	250	70	30	401	85	45	291	65
Future Volume (veh/h)	55	230	40	105	250	70	30	401	85	45	291	65
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.91	0.97		0.91	0.92		0.83	0.96		0.83
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1588	1525	1620	1588	1588	1620	1620	1588	1555	1620	1588	1555
Adj Flow Rate, veh/h	57	240	34	109	260	59	31	418	67	47	303	47
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	390	657	93	472	626	142	85	903	140	121	719	119
Arrive On Green	0.51	0.51	0.51	0.17	0.17	0.17	0.13	0.13	0.13	0.77	0.77	0.77
Sat Flow, veh/h	937	1288	182	960	1227	278	92	2345	363	169	1869	309
Grp Volume(v), veh/h	57	0	274	109	0	319	278	0	238	197	0	200
Grp Sat Flow(s),veh/h/ln	937	0	1471	960	0	1505	1509	0	1291	1030	0	1316
Q Serve(g_s), s	3.5	0.0	9.0	8.2	0.0	15.2	0.0	0.0	13.7	3.3	0.0	4.0
Cycle Q Clear(g_c), s	18.7	0.0	9.0	17.2	0.0	15.2	13.0	0.0	13.7	17.1	0.0	4.0
Prop In Lane	1.00		0.12	1.00		0.18	0.11		0.28	0.24		0.23
Lane Grp Cap(c), veh/h	390	0	750	472	0	768	631	0	497	452	0	507
V/C Ratio(X)	0.15	0.00	0.37	0.23	0.00	0.42	0.44	0.00	0.48	0.43	0.00	0.40
Avail Cap(c_a), veh/h	390	0	750	472	0	768	631	0	497	452	0	507
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.92	0.00	0.92	0.87	0.00	0.87	0.85	0.00	0.85
Uniform Delay (d), s/veh	19.7	0.0	11.8	27.5	0.0	22.6	27.1	0.0	27.5	7.0	0.0	6.1
Incr Delay (d2), s/veh	0.8	0.0	1.4	1.1	0.0	1.5	1.9	0.0	2.9	2.6	0.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	3.9	2.3	0.0	6.7	6.0	0.0	5.3	1.5	0.0	1.6
LnGrp Delay(d),s/veh	20.5	0.0	13.2	28.5	0.0	24.1	29.1	0.0	30.3	9.6	0.0	8.1
LnGrp LOS	C		B	C		C	C		C	A		A
Approach Vol, veh/h		331			428			516			397	
Approach Delay, s/veh		14.4			25.3			29.7			8.8	
Approach LOS		B			C			C			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		45.0		35.0		45.0		35.0				
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2		* 4.2				
Max Green Setting (Gmax), s		* 41		* 31		* 41		* 31				
Max Q Clear Time (g_c+I1), s		20.7		15.7		19.2		19.1				
Green Ext Time (p_c), s		2.9		4.0		4.1		2.7				
Intersection Summary												
HCM 2010 Ctrl Delay			20.6									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis

8: 4th & Tamalpais

Baseline Plus Project Buildout

10/01/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Volume (vph)	0	370	380	65	0	55
Future Volume (vph)	0	370	380	65	0	55
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0	6.0			5.6
Lane Util. Factor		1.00	1.00			1.00
Frbp, ped/bikes		1.00	0.97			0.78
Flpb, ped/bikes		1.00	1.00			1.00
Frt		1.00	0.98			0.86
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		1588	1516			1074
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		1588	1516			1074
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	385	396	68	0	57
RTOR Reduction (vph)	0	0	7	0	0	48
Lane Group Flow (vph)	0	385	457	0	0	9
Confl. Peds. (#/hr)				59		78
Confl. Bikes (#/hr)				14		
Turn Type		NA	NA			Perm
Protected Phases		2 8	4 6			
Permitted Phases						8
Actuated Green, G (s)		55.1	56.1			12.3
Effective Green, g (s)		55.1	56.1			12.3
Actuated g/C Ratio		0.69	0.70			0.15
Clearance Time (s)						5.6
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)		1093	1063			165
v/s Ratio Prot		c0.24	c0.30			
v/s Ratio Perm						0.01
v/c Ratio		0.35	0.43			0.05
Uniform Delay, d1		5.1	5.1			28.9
Progression Factor		0.96	0.17			1.00
Incremental Delay, d2		0.2	0.2			0.1
Delay (s)		5.1	1.1			29.0
Level of Service		A	A			C
Approach Delay (s)		5.1	1.1		29.0	
Approach LOS		A	A		C	
Intersection Summary						
HCM 2000 Control Delay			4.5		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.47			
Actuated Cycle Length (s)			80.0		Sum of lost time (s)	17.6
Intersection Capacity Utilization			51.0%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

9: Hetherton & 4th

Baseline Plus Project Buildout

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↖	↑						↑↑↑	↗
Traffic Volume (vph)	0	270	110	80	240	0	0	0	0	125	968	230
Future Volume (vph)	0	270	110	80	240	0	0	0	0	125	968	230
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	13	10	15	11	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Lane Util. Factor		1.00	1.00	1.00	1.00						0.91	1.00
Frbp, ped/bikes		1.00	0.93	1.00	1.00						1.00	0.92
Flpb, ped/bikes		1.00	1.00	0.97	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						0.99	1.00
Satd. Flow (prot)		1641	1173	1605	1535						4143	1102
Flt Permitted		1.00	1.00	0.52	1.00						0.99	1.00
Satd. Flow (perm)		1641	1173	874	1535						4143	1102
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	281	115	83	250	0	0	0	0	130	1008	240
RTOR Reduction (vph)	0	0	28	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	281	87	83	250	0	0	0	0	0	1138	240
Confl. Peds. (#/hr)			51	51		28			11	11		19
Confl. Bikes (#/hr)			10			16			1			1
Parking (#/hr)											2	2
Turn Type		NA	Perm	Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases			4	8						2		5
Actuated Green, G (s)		34.8	34.8	34.8	34.8						36.4	29.4
Effective Green, g (s)		34.8	34.8	34.8	34.8						36.4	29.4
Actuated g/C Ratio		0.43	0.43	0.43	0.43						0.45	0.37
Clearance Time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		713	510	380	667						1885	404
v/s Ratio Prot		c0.17			0.16							
v/s Ratio Perm			0.07	0.10							0.27	0.22
v/c Ratio		0.39	0.17	0.22	0.37						0.60	0.59
Uniform Delay, d1		15.4	13.8	14.1	15.3						16.4	20.5
Progression Factor		0.52	0.39	0.89	0.92						0.38	0.49
Incremental Delay, d2		1.6	0.7	1.2	1.5						1.1	4.9
Delay (s)		9.6	6.0	13.7	15.5						7.4	14.9
Level of Service		A	A	B	B						A	B
Approach Delay (s)		8.6			15.1			0.0			8.7	
Approach LOS		A			B			A			A	

Intersection Summary



















HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
10: Irwin & 4th

Baseline Plus Project Buildout















10/01/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	210	0	0	195	90	125	1320	160	0	0	0
Future Volume (veh/h)	175	210	0	0	195	90	125	1320	160	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.95	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1588	1588	0	0	1588	1620	1525	1588	1620			
Adj Flow Rate, veh/h	182	219	0	0	203	72	130	1375	147			
Adj No. of Lanes	1	1	0	0	1	0	1	3	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	234	552	0	0	333	118	795	2176	233			
Arrive On Green	0.11	0.11	0.00	0.00	0.11	0.11	0.18	0.18	0.18			
Sat Flow, veh/h	985	1588	0	0	959	340	1452	3974	425			
Grp Volume(v), veh/h	182	219	0	0	0	275	130	1000	522			
Grp Sat Flow(s),veh/h/ln	985	1588	0	0	0	1299	1452	1445	1508			
Q Serve(g_s), s	11.7	10.2	0.0	0.0	0.0	16.1	6.0	25.6	25.6			
Cycle Q Clear(g_c), s	27.8	10.2	0.0	0.0	0.0	16.1	6.0	25.6	25.6			
Prop In Lane	1.00		0.00	0.00		0.26	1.00		0.28			
Lane Grp Cap(c), veh/h	234	552	0	0	0	451	795	1583	825			
V/C Ratio(X)	0.78	0.40	0.00	0.00	0.00	0.61	0.16	0.63	0.63			
Avail Cap(c_a), veh/h	234	552	0	0	0	451	795	1583	825			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	0.33	0.33	0.33	0.33	0.33			
Upstream Filter(I)	0.92	0.92	0.00	0.00	0.00	1.00	0.28	0.28	0.28			
Uniform Delay (d), s/veh	44.7	27.6	0.0	0.0	0.0	30.2	17.3	25.3	25.3			
Incr Delay (d2), s/veh	20.7	2.0	0.0	0.0	0.0	6.0	0.1	0.5	1.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.4	4.8	0.0	0.0	0.0	6.6	2.5	10.4	10.9			
LnGrp Delay(d),s/veh	65.4	29.6	0.0	0.0	0.0	36.3	17.4	25.9	26.4			
LnGrp LOS	E	C				D	B	C	C			
Approach Vol, veh/h		401			275			1652				
Approach Delay, s/veh		45.9			36.3			25.4				
Approach LOS		D			D			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		32.0		48.0		32.0						
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2						
Max Green Setting (Gmax), s		* 28		* 44		* 28						
Max Q Clear Time (g_c+I1), s		29.8		27.6		18.1						
Green Ext Time (p_c), s		0.0		7.9		0.8						
Intersection Summary												
HCM 2010 Ctrl Delay			30.2									
HCM 2010 LOS			C									
Notes												

HCM 2010 Signalized Intersection Summary
11: D & 3rd

Baseline Plus Project Buildout













10/01/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	300	1496	0	0	0	0	0	280	50
Future Volume (veh/h)	0	0	0	300	1496	0	0	0	0	0	280	50
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.95
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.82
Adj Sat Flow, veh/h/ln				1530	1500	0				0	1500	1530
Adj Flow Rate, veh/h				312	1558	0				0	292	33
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				452	1997	0				0	626	70
Arrive On Green				0.21	0.21	0.00				0.00	0.27	0.27
Sat Flow, veh/h				621	3331	0				0	2415	261
Grp Volume(v), veh/h				675	1195	0				0	176	149
Grp Sat Flow(s),veh/h/ln				1345	1242	0				0	1425	1176
Q Serve(g_s), s				38.3	36.3	0.0				0.0	8.3	8.5
Cycle Q Clear(g_c), s				38.3	36.3	0.0				0.0	8.3	8.5
Prop In Lane				0.46		0.00				0.00		0.22
Lane Grp Cap(c), veh/h				903	1546	0				0	381	315
V/C Ratio(X)				0.75	0.77	0.00				0.00	0.46	0.47
Avail Cap(c_a), veh/h				903	1546	0				0	381	315
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				27.2	26.4	0.0				0.0	24.5	24.6
Incr Delay (d2), s/veh				5.6	3.8	0.0				0.0	4.0	5.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				15.7	13.3	0.0				0.0	3.7	3.2
LnGrp Delay(d),s/veh				32.8	30.2	0.0				0.0	28.5	29.6
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1870						325	
Approach Delay, s/veh					31.2						29.0	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		54.0		26.0								
Change Period (Y+Rc), s		* 4.2		4.6								
Max Green Setting (Gmax), s		* 50		21.4								
Max Q Clear Time (g_c+I1), s		40.3		10.5								
Green Ext Time (p_c), s		6.3		1.0								
Intersection Summary												
HCM 2010 Ctrl Delay				30.9								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary
12: C & 3rd

Baseline Plus Project Buildout















10/01/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑		↑↑				
Traffic Volume (veh/h)	0	0	0	0	1666	150	140	310	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1666	150	140	310	0	0	0	0
Number				5	2	12	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.98	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1412	1412	1440	1412	0			
Adj Flow Rate, veh/h				0	1735	120	146	323	0			
Adj No. of Lanes				0	3	1	0	2	0			
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %				0	2	2	2	2	0			
Cap, veh/h				0	2351	717	266	507	0			
Arrive On Green				0.00	0.20	0.20	0.09	0.09	0.00			
Sat Flow, veh/h				0	3981	1175	683	1842	0			
Grp Volume(v), veh/h				0	1735	120	253	216	0			
Grp Sat Flow(s),veh/h/ln				0	1285	1175	1241	1220	0			
Q Serve(g_s), s				0.0	33.8	6.8	14.8	13.6	0.0			
Cycle Q Clear(g_c), s				0.0	33.8	6.8	15.8	13.6	0.0			
Prop In Lane				0.00		1.00	0.58		0.00			
Lane Grp Cap(c), veh/h				0	2351	717	425	348	0			
V/C Ratio(X)				0.00	0.74	0.17	0.60	0.62	0.00			
Avail Cap(c_a), veh/h				0	2351	717	425	348	0			
HCM Platoon Ratio				1.00	0.33	0.33	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	26.0	15.2	33.0	32.1	0.0			
Incr Delay (d2), s/veh				0.0	2.1	0.5	6.0	8.1	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	12.5	2.3	6.1	5.4	0.0			
LnGrp Delay(d),s/veh				0.0	28.1	15.7	39.0	40.2	0.0			
LnGrp LOS					C	B	D	D				
Approach Vol, veh/h					1855			469				
Approach Delay, s/veh					27.3			39.6				
Approach LOS					C			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		53.0		27.0								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 49		* 23								
Max Q Clear Time (g_c+I1), s		35.8		17.8								
Green Ext Time (p_c), s		8.2		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay				29.7								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary
13: B & 3rd

Baseline Plus Project Buildout

















10/01/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	180	1731	0	0	0	0	0	275	90
Future Volume (veh/h)	0	0	0	180	1731	0	0	0	0	0	275	90
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.86
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1440	1412	0				0	1412	1440
Adj Flow Rate, veh/h				188	1803	0				0	286	77
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				263	2124	0				0	499	129
Arrive On Green				0.21	0.21	0.00				0.00	0.26	0.26
Sat Flow, veh/h				324	3460	0				0	1988	496
Grp Volume(v), veh/h				733	1258	0				0	196	167
Grp Sat Flow(s),veh/h/ln				1331	1169	0				0	1341	1072
Q Serve(g_s), s				40.2	41.3	0.0				0.0	10.2	10.9
Cycle Q Clear(g_c), s				42.6	41.3	0.0				0.0	10.2	10.9
Prop In Lane				0.26		0.00				0.00		0.46
Lane Grp Cap(c), veh/h				902	1485	0				0	349	279
V/C Ratio(X)				0.81	0.85	0.00				0.00	0.56	0.60
Avail Cap(c_a), veh/h				902	1485	0				0	349	279
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				28.3	27.9	0.0				0.0	25.7	25.9
Incr Delay (d2), s/veh				8.0	6.2	0.0				0.0	6.4	9.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				17.7	14.7	0.0				0.0	4.4	3.9
LnGrp Delay(d),s/veh				36.3	34.0	0.0				0.0	32.1	35.1
LnGrp LOS				D	C						C	D
Approach Vol, veh/h					1991						363	
Approach Delay, s/veh					34.9						33.5	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		55.0		25.0								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 51		* 21								
Max Q Clear Time (g_c+I1), s		44.6		12.9								
Green Ext Time (p_c), s		4.7		1.0								
Intersection Summary												
HCM 2010 Ctrl Delay				34.6								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary
14: A & 3rd

Baseline Plus Project Buildout

10/01/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	70	1581	90	240	155	0	0	170	50
Future Volume (veh/h)	0	0	0	70	1581	90	240	155	0	0	170	50
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.91	0.96		1.00	1.00		0.92
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1800	1765	1800	1853	1853	0	0	1853	1890
Adj Flow Rate, veh/h				73	1647	87	250	161	0	0	177	38
Adj No. of Lanes				0	3	0	1	1	0	0	1	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				105	2506	137	299	649	0	0	299	64
Arrive On Green				0.18	0.18	0.18	0.10	0.58	0.00	0.00	0.23	0.23
Sat Flow, veh/h				192	4610	251	1765	1853	0	0	1294	278
Grp Volume(v), veh/h				666	555	586	250	161	0	0	0	215
Grp Sat Flow(s),veh/h/ln				1755	1606	1692	1765	1853	0	0	0	1571
Q Serve(g_s), s				28.5	25.6	25.7	2.1	3.4	0.0	0.0	0.0	9.7
Cycle Q Clear(g_c), s				28.5	25.6	25.7	2.1	3.4	0.0	0.0	0.0	9.7
Prop In Lane				0.11		0.15	1.00		0.00	0.00		0.18
Lane Grp Cap(c), veh/h				954	873	920	299	649	0	0	0	363
V/C Ratio(X)				0.70	0.64	0.64	0.84	0.25	0.00	0.00	0.00	0.59
Avail Cap(c_a), veh/h				954	873	920	299	649	0	0	0	363
HCM Platoon Ratio				0.33	0.33	0.33	1.67	1.67	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				26.7	25.5	25.5	32.4	11.5	0.0	0.0	0.0	27.4
Incr Delay (d2), s/veh				4.2	3.5	3.4	23.3	0.9	0.0	0.0	0.0	6.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				15.0	12.2	12.9	7.0	1.9	0.0	0.0	0.0	4.9
LnGrp Delay(d),s/veh				30.9	29.0	28.9	55.7	12.4	0.0	0.0	0.0	34.3
LnGrp LOS				C	C	C	E	B				C
Approach Vol, veh/h					1807			411			215	
Approach Delay, s/veh					29.7			38.7			34.3	
Approach LOS					C			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			9.0	23.0		48.0		32.0				
Change Period (Y+Rc), s			4.0	4.5		4.5		4.0				
Max Green Setting (Gmax), s			5.0	18.5		43.5		28.0				
Max Q Clear Time (g_c+I1), s			4.1	11.7		30.5		5.4				
Green Ext Time (p_c), s			0.2	0.8		10.9		1.2				
Intersection Summary												
HCM 2010 Ctrl Delay				31.6								
HCM 2010 LOS				C								

Intersection 15 Brooks St/3rd St Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	42	40	94.2%	12.5	3.8	B
	Through	5	3	69.1%	11.1	12.7	B
	Right Turn						
	Subtotal	47	43	91.5%	13.3	3.4	B
SB	Left Turn						
	Through	10	11	111.4%	25.8	13.0	D
	Right Turn	5	4	76.8%	7.7	11.6	A
	Subtotal	15	15	99.8%	22.1	9.8	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	88	86	97.3%	3.2	0.3	A
	Through	1,699	1,705	100.4%	2.4	0.2	A
	Right Turn	5	6	115.2%	1.9	0.2	A
	Subtotal	1,792	1,797	100.3%	2.4	0.2	A
Total		1,854	1,855	100.0%	2.9	0.3	A
















Intersection 16 Lindero St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	122	118	96.6%	26.0	2.9	C
	Through	20	17	84.5%	26.7	5.1	C
	Right Turn						
	Subtotal	142	135	94.9%	25.8	2.6	C
SB	Left Turn						
	Through	50	48	96.0%	21.3	5.9	C
	Right Turn	10	8	76.8%	11.9	9.5	B
	Subtotal	60	56	92.8%	20.8	4.7	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	232	222	95.7%	13.6	6.8	B
	Through	1,747	1,739	99.5%	10.8	2.1	B
	Right Turn	40	42	105.6%	9.2	3.5	A
	Subtotal	2,019	2,003	99.2%	11.1	2.4	B
Total		2,221	2,193	98.8%	12.2	2.3	B

HCM 2010 Signalized Intersection Summary
17: Lincoln & 3rd



















Baseline Plus Project Buildout

10/01/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	100	1717	130	41	331	0	0	265	151
Future Volume (veh/h)	0	0	0	100	1717	130	41	331	0	0	265	151
Number				1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	0.97		1.00	1.00		0.83
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1620	1588	1620	1620	1588	0	0	1525	1555
Adj Flow Rate, veh/h				104	1789	125	43	345	0	0	276	150
Adj No. of Lanes				0	3	0	0	2	0	0	2	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				125	2288	164	101	733	0	0	550	280
Arrive On Green				0.19	0.19	0.19	0.64	0.64	0.00	0.00	0.11	0.11
Sat Flow, veh/h				220	4023	289	144	2371	0	0	1802	878
Grp Volume(v), veh/h				745	620	653	194	194	0	0	229	197
Grp Sat Flow(s),veh/h/ln				1577	1445	1510	1070	1373	0	0	1448	1155
Q Serve(g_s), s				36.4	32.5	32.8	2.6	5.7	0.0	0.0	11.9	13.0
Cycle Q Clear(g_c), s				36.4	32.5	32.8	15.5	5.7	0.0	0.0	11.9	13.0
Prop In Lane				0.14		0.19	0.22		0.00	0.00		0.76
Lane Grp Cap(c), veh/h				897	822	859	396	438	0	0	462	368
V/C Ratio(X)				0.83	0.75	0.76	0.49	0.44	0.00	0.00	0.50	0.54
Avail Cap(c_a), veh/h				897	822	859	396	438	0	0	462	368
HCM Platoon Ratio				0.33	0.33	0.33	2.00	2.00	1.00	1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				28.8	27.2	27.3	11.4	10.9	0.0	0.0	29.7	30.2
Incr Delay (d2), s/veh				8.8	6.4	6.3	4.3	3.2	0.0	0.0	3.8	5.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				18.1	14.4	15.2	2.4	2.4	0.0	0.0	5.3	4.7
LnGrp Delay(d),s/veh				37.6	33.6	33.6	15.7	14.2	0.0	0.0	33.5	35.7
LnGrp LOS				D	C	C	B	B			C	D
Approach Vol, veh/h					2018			388			426	
Approach Delay, s/veh					35.1			14.9			34.5	
Approach LOS					D			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				30.0		50.0		30.0				
Change Period (Y+Rc), s				4.5		4.5		4.5				
Max Green Setting (Gmax), s				25.5		45.5		25.5				
Max Q Clear Time (g_c+I1), s				17.5		38.4		15.0				
Green Ext Time (p_c), s				1.0		5.2		1.5				
Intersection Summary												
HCM 2010 Ctrl Delay					32.2							
HCM 2010 LOS					C							


















HCM Signalized Intersection Capacity Analysis
18: Tamalpais & 3rd

Baseline Plus Project Buildout
01/21/2019

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					  								
Traffic Volume (vph)	0	0	0	300	1792	30	110	50	0	0	30	30	
Future Volume (vph)	0	0	0	300	1792	30	110	50	0	0	30	30	
Ideal Flow (vphpl)	1800	1800	1800	1600	1600	1600	1600	1600	1800	1800	1600	1600	
Lane Width	12	12	12	12	12	12	11	12	12	12	12	12	
Total Lost time (s)					11.6		7.6	7.6			7.6		
Lane Util. Factor					0.91		1.00	1.00			1.00		
Frbp, ped/bikes					1.00		1.00	1.00			0.97		
Flpb, ped/bikes					0.97		0.96	1.00			1.00		
Frt					1.00		1.00	1.00			0.93		
Flt Protected					0.99		0.95	1.00			1.00		
Satd. Flow (prot)					3684		1100	1249			1128		
Flt Permitted					0.99		0.72	1.00			1.00		
Satd. Flow (perm)					3684		830	1249			1128		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0	0	0	312	1867	31	115	52	0	0	31	31	
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	8	0	
Lane Group Flow (vph)	0	0	0	0	2209	0	115	52	0	0	54	0	
Confl. Peds. (#/hr)			106	106		44	30		69			30	
Confl. Bikes (#/hr)						2			3			8	
Parking (#/hr)							3	3			3	3	
Turn Type				Perm	NA		Perm	NA			NA		
Protected Phases					6			4			8		
Permitted Phases				6			4						
Actuated Green, G (s)					51.4		19.4	19.4			19.4		
Effective Green, g (s)					51.4		19.4	19.4			19.4		
Actuated g/C Ratio					0.57		0.22	0.22			0.22		
Clearance Time (s)					11.6		7.6	7.6			7.6		
Lane Grp Cap (vph)					2103		178	269			243		
v/s Ratio Prot								0.04			0.05		
v/s Ratio Perm					0.60		0.14						
v/c Ratio					1.05		0.65	0.19			0.22		
Uniform Delay, d1					19.3		32.2	28.9			29.1		
Progression Factor					1.00		1.00	1.00			1.00		
Incremental Delay, d2					34.5		16.7	1.6			2.1		
Delay (s)					53.8		48.9	30.5			31.2		
Level of Service					D		D	C			C		
Approach Delay (s)		0.0			53.8			43.2			31.2		
Approach LOS		A			D			D			C		
Intersection Summary													
HCM 2000 Control Delay			52.5		HCM 2000 Level of Service						D		
HCM 2000 Volume to Capacity ratio			0.94										
Actuated Cycle Length (s)			90.0		Sum of lost time (s)						19.2		
Intersection Capacity Utilization			158.7%		ICU Level of Service						H		
Analysis Period (min)			15										
c Critical Lane Group													

HCM 2010 Signalized Intersection Summary
19: Hetherton & 3rd













Baseline Plus Project Buildout
01/21/2019













												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	480	1604	0	0	0	0	0	665	493
Future Volume (veh/h)	0	0	0	480	1604	0	0	0	0	0	665	493
Number				1	6	16				3	8	18
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.85
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1560	1588	0				0	1588	1500
Adj Flow Rate, veh/h				500	1671	0				0	693	506
Adj No. of Lanes				1	3	0				0	3	1
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				740	2085	0				0	1951	489
Arrive On Green				0.14	0.14	0.00				0.00	0.15	0.15
Sat Flow, veh/h				1486	4765	0				0	4479	1088
Grp Volume(v), veh/h				500	1671	0				0	693	506
Grp Sat Flow(s),veh/h/ln				1486	1588	0				0	1445	1088
Q Serve(g_s), s				25.9	27.1	0.0				0.0	11.5	36.0
Cycle Q Clear(g_c), s				25.9	27.1	0.0				0.0	11.5	36.0
Prop In Lane				1.00		0.00				0.00		1.00
Lane Grp Cap(c), veh/h				740	2085	0				0	1951	489
V/C Ratio(X)				0.68	0.80	0.00				0.00	0.36	1.03
Avail Cap(c_a), veh/h				740	2085	0				0	1951	489
HCM Platoon Ratio				0.33	0.33	1.00				1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				30.3	30.9	0.0				0.0	23.6	34.1
Incr Delay (d2), s/veh				4.9	3.4	0.0				0.0	0.5	49.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.7	12.6	0.0				0.0	4.7	17.6
LnGrp Delay(d),s/veh				35.2	34.2	0.0				0.0	24.1	83.8
LnGrp LOS				D	C						C	F
Approach Vol, veh/h					2171						1199	
Approach Delay, s/veh					34.5						49.3	
Approach LOS					C						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs						6		8				
Phs Duration (G+Y+Rc), s						39.0		41.0				
Change Period (Y+Rc), s						4.0		5.0				
Max Green Setting (Gmax), s						35.0		36.0				
Max Q Clear Time (g_c+I1), s						29.1		38.0				
Green Ext Time (p_c), s						4.7		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay					39.7							
HCM 2010 LOS					D							
Notes												
User approved volume balancing among the lanes for turning movement.												













User approved ignoring U-Turning movement.

HCM 2010 Signalized Intersection Summary
20: Irwin & 3rd/3rd St













Baseline Plus Project Buildout
10/01/2018

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑	↑	↑↑↑				
Traffic Volume (veh/h)	0	0	0	0	1151	195	928	1410	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1151	195	928	1410	0	0	0	0
Number				1	6	16	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.94	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1500	1500	1398	1398	0			
Adj Flow Rate, veh/h				0	1199	189	1061	1337	0			
Adj No. of Lanes				0	3	1	2	2	0			
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %				0	2	2	3	3	0			
Cap, veh/h				0	1510	441	1381	1450	0			
Arrive On Green				0.00	0.37	0.37	0.17	0.17	0.00			
Sat Flow, veh/h				0	4230	1195	2663	2796	0			
Grp Volume(v), veh/h				0	1199	189	1061	1337	0			
Grp Sat Flow(s),veh/h/ln				0	1365	1195	1331	1398	0			
Q Serve(g_s), s				0.0	20.9	9.5	30.4	37.6	0.0			
Cycle Q Clear(g_c), s				0.0	20.9	9.5	30.4	37.6	0.0			
Prop In Lane				0.00		1.00	1.00		0.00			
Lane Grp Cap(c), veh/h				0	1510	441	1381	1450	0			
V/C Ratio(X)				0.00	0.79	0.43	0.77	0.92	0.00			
Avail Cap(c_a), veh/h				0	1510	441	1381	1450	0			
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	22.5	18.9	28.6	31.6	0.0			
Incr Delay (d2), s/veh				0.0	4.4	3.0	4.1	11.1	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	8.4	3.5	12.0	16.8	0.0			
LnGrp Delay(d),s/veh				0.0	26.9	22.0	32.7	42.7	0.0			
LnGrp LOS					C	C	C	D				
Approach Vol, veh/h					1388			2398				
Approach Delay, s/veh					26.3			38.3				
Approach LOS					C			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				46.0		34.0						
Change Period (Y+Rc), s				4.5		4.5						
Max Green Setting (Gmax), s				41.5		29.5						
Max Q Clear Time (g_c+I1), s				39.6		22.9						
Green Ext Time (p_c), s				1.7		3.8						
Intersection Summary												
HCM 2010 Ctrl Delay				33.9								
HCM 2010 LOS				C								
Notes												

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑		↑	↑	
Traffic Volume (veh/h)	0	1527	100	0	0	0	0	0	400	170	430	0
Future Volume (veh/h)	0	1527	100	0	0	0	0	0	400	170	430	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1676	1710				0	1588	1620	1765	1765	0
Adj Flow Rate, veh/h	0	1591	95				0	0	402	177	448	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	0	0	0				0	0	1145	992	1526	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.86	0.29	0.29	0.00
Sat Flow, veh/h		0					0	0	1324	969	1765	0
Grp Volume(v), veh/h		0.0					0	0	402	177	448	0
Grp Sat Flow(s),veh/h/ln							0	0	1324	969	1765	0
Q Serve(g_s), s							0.0	0.0	2.0	4.9	6.7	0.0
Cycle Q Clear(g_c), s							0.0	0.0	2.0	6.9	6.7	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	1145	992	1526	0
V/C Ratio(X)							0.00	0.00	0.35	0.18	0.29	0.00
Avail Cap(c_a), veh/h							0	0	1145	992	1526	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(l)							0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh							0.0	0.0	0.4	4.9	4.0	0.0
Incr Delay (d2), s/veh							0.0	0.0	0.8	0.4	0.5	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	0.9	1.4	3.6	0.0
LnGrp Delay(d),s/veh							0.0	0.0	1.3	5.3	4.5	0.0
LnGrp LOS									A	A	A	
Approach Vol, veh/h								402			625	
Approach Delay, s/veh								1.3			4.7	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				34.0				34.0				
Change Period (Y+Rc), s				4.6				4.6				
Max Green Setting (Gmax), s				29.4				29.4				
Max Q Clear Time (g_c+I1), s				8.9				4.0				
Green Ext Time (p_c), s				1.8				1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			3.4									
HCM 2010 LOS			A									

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑↑				
Traffic Volume (veh/h)	185	1917	0	0	0	0	0	245	120	0	0	0
Future Volume (veh/h)	185	1917	0	0	0	0	0	245	120	0	0	0
Number	1	6	16				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.98			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1440	1500	0				0	1500	1440			
Adj Flow Rate, veh/h	193	1997	0				0	255	120			
Adj No. of Lanes	0	3	0				0	2	0			
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0				0	2	2			
Cap, veh/h	251	2157	0				0	626	284			
Arrive On Green	0.19	0.19	0.00				0.00	0.32	0.32			
Sat Flow, veh/h	343	3801	0				0	1940	881			
Grp Volume(v), veh/h	763	1427	0				0	195	180			
Grp Sat Flow(s),veh/h/ln	1414	1365	0				0	1500	1322			
Q Serve(g_s), s	41.0	41.1	0.0				0.0	8.1	8.5			
Cycle Q Clear(g_c), s	42.7	41.1	0.0				0.0	8.1	8.5			
Prop In Lane	0.25		0.00				0.00		0.67			
Lane Grp Cap(c), veh/h	859	1549	0				0	484	426			
V/C Ratio(X)	0.89	0.92	0.00				0.00	0.40	0.42			
Avail Cap(c_a), veh/h	859	1549	0				0	484	426			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	31.4	30.7	0.0				0.0	21.1	21.3			
Incr Delay (d2), s/veh	13.2	10.5	0.0				0.0	2.5	3.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	19.9	17.8	0.0				0.0	3.7	3.5			
LnGrp Delay(d),s/veh	44.6	41.2	0.0				0.0	23.6	24.3			
LnGrp LOS	D	D						C	C			
Approach Vol, veh/h		2190						375				
Approach Delay, s/veh		42.4						23.9				
Approach LOS		D						C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				30.0		50.0						
Change Period (Y+Rc), s				* 4.2		4.6						
Max Green Setting (Gmax), s				* 26		45.4						
Max Q Clear Time (g_c+I1), s				10.5		44.7						
Green Ext Time (p_c), s				2.8		0.7						
Intersection Summary												
HCM 2010 Ctrl Delay			39.7									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary
23: B & 2nd

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑		↑	↑	
Traffic Volume (veh/h)	0	1962	80	0	0	0	0	0	230	200	270	0
Future Volume (veh/h)	0	1962	80	0	0	0	0	0	230	200	270	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.95	0.98		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1500	1382				0	1588	1591	1560	1500	0
Adj Flow Rate, veh/h	0	2044	78				0	0	224	208	281	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	0	0	0				0	0	1101	1057	1282	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.85	0.28	0.28	0.00
Sat Flow, veh/h		0					0	0	1288	1001	1500	0
Grp Volume(v), veh/h		0.0					0	0	224	208	281	0
Grp Sat Flow(s),veh/h/ln							0	0	1288	1001	1500	0
Q Serve(g_s), s							0.0	0.0	0.9	5.0	4.4	0.0
Cycle Q Clear(g_c), s							0.0	0.0	0.9	6.0	4.4	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	1101	1057	1282	0
V/C Ratio(X)							0.00	0.00	0.20	0.20	0.22	0.00
Avail Cap(c_a), veh/h							0	0	1101	1057	1282	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh							0.0	0.0	0.4	4.1	3.2	0.0
Incr Delay (d2), s/veh							0.0	0.0	0.4	0.4	0.4	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	0.4	1.5	2.0	0.0
LnGrp Delay(d),s/veh							0.0	0.0	0.8	4.5	3.6	0.0
LnGrp LOS									A	A	A	
Approach Vol, veh/h								224			489	
Approach Delay, s/veh								0.8			4.0	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				31.0				31.0				
Change Period (Y+Rc), s				4.5				4.5				
Max Green Setting (Gmax), s				26.5				26.5				
Max Q Clear Time (g_c+I1), s				8.0				2.9				
Green Ext Time (p_c), s				1.4				0.6				
Intersection Summary												
HCM 2010 Ctrl Delay			3.0									
HCM 2010 LOS			A									

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	2117	175	0	0	0	0	305	30	110	130	0
Future Volume (veh/h)	100	2117	175	0	0	0	0	305	30	110	130	0
Number	5	2	12				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95				1.00		0.92	0.96		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1765	1800				0	1676	1710	1676	1744	0
Adj Flow Rate, veh/h	104	2205	171				0	318	22	115	135	0
Adj No. of Lanes	0	3	0				0	2	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	116	2597	205				0	629	43	255	543	0
Arrive On Green	0.19	0.19	0.19				0.00	0.21	0.21	0.03	0.21	0.00
Sat Flow, veh/h	200	4488	354				0	3088	206	1597	1744	0
Grp Volume(v), veh/h	911	757	812				0	167	173	115	135	0
Grp Sat Flow(s),veh/h/ln	1755	1606	1682				0	1593	1618	1597	1744	0
Q Serve(g_s), s	40.7	36.2	37.2				0.0	7.4	7.6	0.0	5.2	0.0
Cycle Q Clear(g_c), s	40.7	36.2	37.2				0.0	7.4	7.6	0.0	5.2	0.0
Prop In Lane	0.11		0.21				0.00		0.13	1.00		0.00
Lane Grp Cap(c), veh/h	1015	929	973				0	334	339	255	543	0
V/C Ratio(X)	0.90	0.81	0.83				0.00	0.50	0.51	0.45	0.25	0.00
Avail Cap(c_a), veh/h	1015	929	973				0	334	339	255	543	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.1	28.3	28.7				0.0	28.0	28.1	34.1	23.9	0.0
Incr Delay (d2), s/veh	12.3	7.8	8.3				0.0	5.3	5.4	5.7	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	23.3	18.1	19.6				0.0	3.7	3.9	2.9	2.7	0.0
LnGrp Delay(d),s/veh	42.4	36.1	37.1				0.0	33.3	33.4	39.8	25.0	0.0
LnGrp LOS	D	D	D					C	C	D	C	
Approach Vol, veh/h		2480						340			250	
Approach Delay, s/veh		38.8						33.4			31.8	
Approach LOS		D						C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		51.0		29.2			8.2	21.0				
Change Period (Y+Rc), s		4.6		* 4.2			* 4.2	* 4.2				
Max Green Setting (Gmax), s		46.4		* 25			* 4	* 17				
Max Q Clear Time (g_c+I1), s		42.7		7.2			2.0	9.6				
Green Ext Time (p_c), s		3.6		0.9			0.1	1.5				
Intersection Summary												
HCM 2010 Ctrl Delay			37.6									
HCM 2010 LOS			D									
Notes												


















Intersection 25 Brooks St/2nd St Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	110	102	92.9%	27.8	5.4	D
	Through						
	Right Turn						
	Subtotal	110	102	92.9%	27.8	5.4	D
EB	Left Turn	45	43	94.7%	3.2	0.5	A
	Through	2,247	2,266	100.8%	2.8	0.2	A
	Right Turn						
	Subtotal	2,292	2,309	100.7%	2.8	0.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,402	2,411	100.4%	3.9	0.5	A

Intersection 26 Lindero St/2nd St Signal



















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	91	82	89.9%	20.0	5.0	B
	Right Turn	413	421	102.0%	36.4	12.9	D
	Subtotal	504	503	99.8%	34.0	11.5	C
SB	Left Turn	107	108	100.8%	33.0	21.5	C
	Through	180	164	91.1%	20.2	10.6	C
	Right Turn						
	Subtotal	287	272	94.7%	25.6	15.7	C
EB	Left Turn	51	52	101.6%	16.9	3.3	B
	Through	2,232	2,223	99.6%	16.1	1.8	B
	Right Turn	44	41	94.3%	11.9	3.8	B
	Subtotal	2,327	2,316	99.5%	16.0	1.8	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,118	3,091	99.1%	19.8	2.6	B

HCM 2010 Signalized Intersection Summary
27: Lincoln & 2nd

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	221	2419	52	0	0	0	0	201	130	130	180	0
Future Volume (veh/h)	221	2419	52	0	0	0	0	201	130	130	180	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1412	1412				0	1412	1412	1382	1355	0
Adj Flow Rate, veh/h	230	2520	32				0	209	125	135	188	0
Adj No. of Lanes	0	4	1				0	1	1	0	2	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	215	2541	642				0	491	404	256	438	0
Arrive On Green	0.18	0.18	0.18				0.00	0.35	0.35	0.69	0.69	0.00
Sat Flow, veh/h	393	4642	1172				0	1412	1162	495	1323	0
Grp Volume(v), veh/h	815	1935	32				0	209	125	155	168	0
Grp Sat Flow(s),veh/h/ln	1392	1214	1172				0	1412	1162	585	1172	0
Q Serve(g_s), s	43.8	42.2	1.8				0.0	9.1	6.3	11.6	4.9	0.0
Cycle Q Clear(g_c), s	43.8	42.2	1.8				0.0	9.1	6.3	20.7	4.9	0.0
Prop In Lane	0.28		1.00				0.00		1.00	0.87		0.00
Lane Grp Cap(c), veh/h	762	1994	642				0	491	404	287	407	0
V/C Ratio(X)	1.07	0.97	0.05				0.00	0.43	0.31	0.54	0.41	0.00
Avail Cap(c_a), veh/h	762	1994	642				0	491	404	287	407	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.8	32.1	15.6				0.0	20.0	19.1	14.4	8.7	0.0
Incr Delay (d2), s/veh	52.7	14.3	0.1				0.0	2.7	2.0	7.1	3.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	28.0	16.9	0.6				0.0	3.9	2.2	3.3	1.8	0.0
LnGrp Delay(d),s/veh	85.4	46.4	15.7				0.0	22.7	21.1	21.5	11.8	0.0
LnGrp LOS	F	D	B					C	C	C	B	
Approach Vol, veh/h		2782						334			323	
Approach Delay, s/veh		57.5						22.1			16.4	
Approach LOS		E						C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		48.0		32.0				32.0				
Change Period (Y+Rc), s		* 4.2		* 4.2				* 4.2				
Max Green Setting (Gmax), s		* 44		* 28				* 28				
Max Q Clear Time (g_c+I1), s		45.8		11.1				22.7				
Green Ext Time (p_c), s		0.0		1.3				0.7				
Intersection Summary												
HCM 2010 Ctrl Delay			50.2									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary
 28: Francisco W./Tamalpais & 2nd

















Baseline Plus Project Buildout
 10/01/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	2529	120	0	0	0	0	140	340	85	235	0
Future Volume (veh/h)	30	2529	120	0	0	0	0	140	340	85	235	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1412	1412				0	1412	1468	1412	1412	0
Adj Flow Rate, veh/h	31	2634	78				0	146	319	89	245	0
Adj No. of Lanes	0	4	1				0	1	1	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	30	2740	614				0	408	351	243	408	0
Arrive On Green	0.18	0.18	0.18				0.00	0.29	0.29	0.58	0.58	0.00
Sat Flow, veh/h	55	4996	1119				0	1412	1216	738	1412	0
Grp Volume(v), veh/h	795	1870	78				0	146	319	89	245	0
Grp Sat Flow(s),veh/h/ln	1409	1214	1119				0	1412	1216	738	1412	0
Q Serve(g_s), s	43.9	40.5	4.7				0.0	6.6	20.2	7.4	9.0	0.0
Cycle Q Clear(g_c), s	43.9	40.5	4.7				0.0	6.6	20.2	14.0	9.0	0.0
Prop In Lane	0.04		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	773	1998	614				0	408	351	243	408	0
V/C Ratio(X)	1.03	0.94	0.13				0.00	0.36	0.91	0.37	0.60	0.00
Avail Cap(c_a), veh/h	773	1998	614				0	468	403	274	468	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	0.09	0.09	0.09				0.00	1.00	1.00	0.97	0.97	0.00
Uniform Delay (d), s/veh	32.8	31.4	16.7				0.0	22.6	27.4	17.5	13.9	0.0
Incr Delay (d2), s/veh	18.3	1.1	0.0				0.0	0.5	22.1	0.9	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.1	13.9	1.5				0.0	2.6	8.9	1.5	3.6	0.0
LnGrp Delay(d),s/veh	51.1	32.5	16.7				0.0	23.1	49.5	18.4	15.5	0.0
LnGrp LOS	F	C	B					C	D	B	B	
Approach Vol, veh/h		2743						465			334	
Approach Delay, s/veh		37.4						41.2			16.3	
Approach LOS		D						D			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		50.4		29.6				29.6				
Change Period (Y+Rc), s		6.5		6.5				6.5				
Max Green Setting (Gmax), s		40.5		26.5				26.5				
Max Q Clear Time (g_c+I1), s		45.9		22.2				16.0				
Green Ext Time (p_c), s		0.0		0.9				1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			35.9									
HCM 2010 LOS			D									

















HCM 2010 Signalized Intersection Summary
 29: 101 SBO on Hetherton/Hetherton & 2nd/2nd St

Baseline Plus Project Buildout

10/01/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1856	1093	0	0	0	0	0	0	365	780	0
Future Volume (veh/h)	0	1856	1093	0	0	0	0	0	0	365	780	0
Number	5	2	12							7	4	14
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1500	1500							1500	1500	0
Adj Flow Rate, veh/h	0	1919	1079							380	812	0
Adj No. of Lanes	0	3	2							1	2	0
Peak Hour Factor	0.96	0.96	0.96							0.96	0.96	0.96
Percent Heavy Veh, %	0	2	2							2	2	0
Cap, veh/h	0	2268	1285							476	1000	0
Arrive On Green	0.00	0.17	0.17							0.11	0.11	0.00
Sat Flow, veh/h	0	4500	2550							1429	3000	0
Grp Volume(v), veh/h	0	1919	1079							380	812	0
Grp Sat Flow(s),veh/h/ln	0	1500	1275							1429	1500	0
Q Serve(g_s), s	0.0	33.1	32.8							20.8	21.2	0.0
Cycle Q Clear(g_c), s	0.0	33.1	32.8							20.8	21.2	0.0
Prop In Lane	0.00		1.00							1.00		0.00
Lane Grp Cap(c), veh/h	0	2268	1285							476	1000	0
V/C Ratio(X)	0.00	0.85	0.84							0.80	0.81	0.00
Avail Cap(c_a), veh/h	0	2268	1285							545	1144	0
HCM Platoon Ratio	1.00	0.33	0.33							0.33	0.33	1.00
Upstream Filter(l)	0.00	0.09	0.09							0.88	0.88	0.00
Uniform Delay (d), s/veh	0.0	30.3	30.2							33.0	33.1	0.0
Incr Delay (d2), s/veh	0.0	0.4	0.7							6.5	3.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.8	11.7							9.1	9.3	0.0
LnGrp Delay(d),s/veh	0.0	30.7	30.9							39.4	36.7	0.0
LnGrp LOS		C	C							D	D	
Approach Vol, veh/h		2998									1192	
Approach Delay, s/veh		30.8									37.6	
Approach LOS		C									D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		48.8		31.2								
Change Period (Y+Rc), s		8.5		4.5								
Max Green Setting (Gmax), s		36.5		30.5								
Max Q Clear Time (g_c+I1), s		35.1		23.2								
Green Ext Time (p_c), s		1.3		3.5								
Intersection Summary												
HCM 2010 Ctrl Delay			32.7									
HCM 2010 LOS			C									
Notes												






















HCM 2010 Signalized Intersection Summary
30: Irwin & 2nd St

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	960	1311	0	0	0	0	0	1398	560	0	0	0
Future Volume (veh/h)	960	1311	0	0	0	0	0	1398	560	0	0	0
Number	5	2	12				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.94			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1468	1500	0				0	1412	1412			
Adj Flow Rate, veh/h	1033	1319	0				0	1456	571			
Adj No. of Lanes	2	2	0				0	3	1			
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0				0	2	2			
Cap, veh/h	1501	1418	0				0	1580	464			
Arrive On Green	0.16	0.16	0.00				0.00	0.41	0.41			
Sat Flow, veh/h	2797	3000	0				0	3981	1132			
Grp Volume(v), veh/h	1033	1319	0				0	1456	571			
Grp Sat Flow(s),veh/h/ln	1398	1500	0				0	1285	1132			
Q Serve(g_s), s	28.4	34.7	0.0				0.0	28.7	32.8			
Cycle Q Clear(g_c), s	28.4	34.7	0.0				0.0	28.7	32.8			
Prop In Lane	1.00		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	1501	1418	0				0	1580	464			
V/C Ratio(X)	0.69	0.93	0.00				0.00	0.92	1.23			
Avail Cap(c_a), veh/h	1501	1418	0				0	1580	464			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	29.8	32.5	0.0				0.0	22.4	23.6			
Incr Delay (d2), s/veh	2.6	12.2	0.0				0.0	10.3	121.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	11.5	16.8	0.0				0.0	11.6	25.8			
LnGrp Delay(d),s/veh	32.4	44.7	0.0				0.0	32.7	145.1			
LnGrp LOS	C	D						C	F			
Approach Vol, veh/h		2352						2027				
Approach Delay, s/veh		39.3						64.4				
Approach LOS		D						E				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		42.0		38.0								
Change Period (Y+Rc), s		* 4.2		* 5.2								
Max Green Setting (Gmax), s		* 38		* 33								
Max Q Clear Time (g_c+I1), s		36.7		34.8								
Green Ext Time (p_c), s		1.0		0.0								
Intersection Summary												
HCM 2010 Ctrl Delay			50.9									
HCM 2010 LOS			D									
Notes												

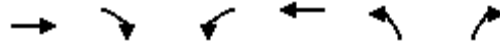
HCM 2010 Signalized Intersection Summary
31: Lindaro & Andersen

Baseline Plus Project Buildout

10/01/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	280	40	70	280	52	60	222	170	103	140	30
Future Volume (veh/h)	20	280	40	70	280	52	60	222	170	103	140	30
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.96	1.00		0.93
Parking Bus, Adj	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 Sat Flow, veh/h/ln	2039	2039	2000	1961	1961	2000	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	21	292	35	73	292	47	62	231	146	107	146	23
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	57	388	46	154	444	71	267	302	191	222	408	64
Arrive On Green	0.03	0.22	0.22	0.08	0.27	0.27	0.15	0.29	0.29	0.13	0.26	0.26
Sat Flow, veh/h	1942	1778	213	1867	1638	264	1774	1048	663	1774	1552	245
Grp Volume(v), veh/h	21	0	327	73	0	339	62	0	377	107	0	169
Grp Sat Flow(s),veh/h/ln	1942	0	1991	1867	0	1902	1774	0	1711	1774	0	1797
Q Serve(g_s), s	0.6	0.0	9.2	2.2	0.0	9.5	1.8	0.0	12.0	3.4	0.0	4.6
Cycle Q Clear(g_c), s	0.6	0.0	9.2	2.2	0.0	9.5	1.8	0.0	12.0	3.4	0.0	4.6
Prop In Lane	1.00		0.11	1.00		0.14	1.00		0.39	1.00		0.14
Lane Grp Cap(c), veh/h	57	0	434	154	0	515	267	0	493	222	0	472
V/C Ratio(X)	0.37	0.00	0.75	0.48	0.00	0.66	0.23	0.00	0.76	0.48	0.00	0.36
Avail Cap(c_a), veh/h	260	0	829	312	0	856	297	0	658	297	0	692
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.4	0.0	21.9	26.2	0.0	19.3	22.3	0.0	19.4	24.3	0.0	17.9
Incr Delay (d2), s/veh	1.4	0.0	2.7	0.8	0.0	1.4	0.2	0.0	3.8	0.6	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	5.3	1.2	0.0	5.1	0.9	0.0	6.2	1.7	0.0	2.3
LnGrp Delay(d),s/veh	29.9	0.0	24.5	27.0	0.0	20.8	22.5	0.0	23.2	24.9	0.0	18.4
LnGrp LOS	C		C	C		C	C		C	C		B
Approach Vol, veh/h		348			412			439			276	
Approach Delay, s/veh		24.9			21.9			23.1			20.9	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	17.9	13.0	19.9	5.8	21.1	11.5	21.4				
Change Period (Y+Rc), s	4.0	4.9	4.0	* 4.2	4.0	4.9	4.0	* 4.2				
Max Green Setting (Gmax), s	10.0	24.9	10.0	* 23	8.0	26.9	10.0	* 23				
Max Q Clear Time (g_c+I1), s	4.2	11.2	3.8	6.6	2.6	11.5	5.4	14.0				
Green Ext Time (p_c), s	0.0	1.1	0.0	0.5	0.0	1.2	0.1	1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			22.8									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis
32: Tamalpais & Mission



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	
Traffic Volume (vph)	490	50	0	635	10	25
Future Volume (vph)	490	50	0	635	10	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0			3.0	5.6	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	0.99	
Frt	0.99			1.00	0.90	
Flt Protected	1.00			1.00	0.99	
Satd. Flow (prot)	1561			1588	1401	
Flt Permitted	1.00			1.00	0.99	
Satd. Flow (perm)	1561			1588	1401	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	510	52	0	661	10	26
RTOR Reduction (vph)	5	0	0	0	21	0
Lane Group Flow (vph)	557	0	0	661	15	0
Confl. Peds. (#/hr)		10	10		10	
Turn Type	NA			NA	Perm	
Protected Phases	2			3 4 6		
Permitted Phases					8	
Actuated Green, G (s)	34.1			54.9	13.9	
Effective Green, g (s)	34.1			48.9	13.9	
Actuated g/C Ratio	0.43			0.61	0.17	
Clearance Time (s)	6.0				5.6	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	665			970	243	
v/s Ratio Prot	c0.36			c0.42		
v/s Ratio Perm					c0.01	
v/c Ratio	0.84			0.68	0.06	
Uniform Delay, d1	20.5			10.4	27.6	
Progression Factor	0.64			0.35	0.72	
Incremental Delay, d2	10.7			0.5	0.1	
Delay (s)	23.8			4.2	20.0	
Level of Service	C			A	C	
Approach Delay (s)	23.8			4.2	20.0	
Approach LOS	C			A	C	

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
33: Tamalpais & 5th

Baseline Plus Project Buildout

10/01/2018



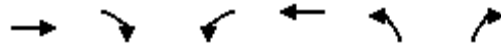
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↕			↕		
Traffic Volume (vph)	0	455	5	0	290	15	30	25	20	10	20	20	
Future Volume (vph)	0	455	5	0	290	15	30	25	20	10	20	20	
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Total Lost time (s)		6.0			6.0			6.0			6.0		
Lane Util. Factor		1.00			1.00			1.00			1.00		
Frbp, ped/bikes		1.00			1.00			1.00			0.98		
Flpb, ped/bikes		1.00			1.00			0.99			1.00		
Frt		1.00			0.99			0.96			0.95		
Flt Protected		1.00			1.00			0.98			0.99		
Satd. Flow (prot)		1585			1574			1487			1461		
Flt Permitted		1.00			1.00			0.85			0.92		
Satd. Flow (perm)		1585			1574			1285			1356		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0	474	5	0	302	16	31	26	21	10	21	21	
RTOR Reduction (vph)	0	0	0	0	2	0	0	19	0	0	19	0	
Lane Group Flow (vph)	0	479	0	0	316	0	0	59	0	0	33	0	
Confl. Peds. (#/hr)	10		10	10		10	10					10	
Turn Type		NA			NA		Perm	NA		Perm	NA		
Protected Phases		2			4	6		8			8		
Permitted Phases							8			8			
Actuated Green, G (s)		43.0			58.8			9.2			9.2		
Effective Green, g (s)		43.0			58.8			9.2			9.2		
Actuated g/C Ratio		0.54			0.73			0.11			0.11		
Clearance Time (s)		6.0						6.0			6.0		
Vehicle Extension (s)		3.0						1.5			1.5		
Lane Grp Cap (vph)		851			1156			147			155		
v/s Ratio Prot		c0.30			c0.20								
v/s Ratio Perm								c0.05			0.02		
v/c Ratio		0.56			0.27			0.40			0.22		
Uniform Delay, d1		12.3			3.5			32.9			32.1		
Progression Factor		0.58			0.05			0.38			0.84		
Incremental Delay, d2		2.3			0.0			0.6			0.1		
Delay (s)		9.4			0.2			13.0			27.1		
Level of Service		A			A			B			C		
Approach Delay (s)		9.4			0.2			13.0			27.1		
Approach LOS		A			A			B			C		
Intersection Summary													
HCM 2000 Control Delay			7.6									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.51										
Actuated Cycle Length (s)			80.0									Sum of lost time (s)	18.0
Intersection Capacity Utilization			47.6%									ICU Level of Service	A
Analysis Period (min)			15										
c	Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

34: Tamalpais & Mission

Baseline Plus Project Buildout

10/01/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Traffic Volume (vph)	515	0	0	625	10	25
Future Volume (vph)	515	0	0	625	10	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0			6.0	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.90	
Flt Protected	1.00			1.00	0.99	
Satd. Flow (prot)	1588			1588	1414	
Flt Permitted	1.00			1.00	0.99	
Satd. Flow (perm)	1588			1588	1414	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	536	0	0	651	10	26
RTOR Reduction (vph)	0	0	0	0	21	0
Lane Group Flow (vph)	536	0	0	651	15	0
Confl. Peds. (#/hr)		10				
Turn Type	NA			NA	Prot	
Protected Phases	2 8			6	3 4	
Permitted Phases						
Actuated Green, G (s)	53.6			34.1	14.8	
Effective Green, g (s)	48.0			34.1	14.8	
Actuated g/C Ratio	0.60			0.43	0.19	
Clearance Time (s)				6.0		
Vehicle Extension (s)				3.0		
Lane Grp Cap (vph)	952			676	261	
v/s Ratio Prot	c0.34			c0.41	c0.01	
v/s Ratio Perm						
v/c Ratio	0.56			0.96	0.06	
Uniform Delay, d1	9.7			22.3	26.9	
Progression Factor	0.29			1.04	1.83	
Incremental Delay, d2	0.4			20.9	0.0	
Delay (s)	3.3			44.0	49.1	
Level of Service	A			D	D	
Approach Delay (s)	3.3			44.0	49.1	
Approach LOS	A			D	D	
Intersection Summary						
HCM 2000 Control Delay		26.3		HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio		0.69				
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		20.2
Intersection Capacity Utilization		50.2%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

Baseline Plus Project Buildout

35: Tamalpais & 5th

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑			↑				
Traffic Volume (vph)	0	485	0	0	285	15	20	20	20	0	0	0
Future Volume (vph)	0	485	0	0	285	15	20	20	20	0	0	0
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		1.00			1.00			1.00				
Frbp, ped/bikes		1.00			1.00			0.99				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.99			0.95				
Flt Protected		1.00			1.00			0.98				
Satd. Flow (prot)		1588			1573			1470				
Flt Permitted		1.00			1.00			0.98				
Satd. Flow (perm)		1588			1573			1470				
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	505	0	0	297	16	21	21	21	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	18	0	0	0	0
Lane Group Flow (vph)	0	505	0	0	311	0	0	45	0	0	0	0
Confl. Peds. (#/hr)	10		10			10			10			
Turn Type		NA			NA		Split	NA				
Protected Phases		2 8			6		4	4				
Permitted Phases												
Actuated Green, G (s)		58.2			43.0			9.8				
Effective Green, g (s)		58.2			43.0			9.8				
Actuated g/C Ratio		0.73			0.54			0.12				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			1.5				
Lane Grp Cap (vph)		1155			845			180				
v/s Ratio Prot		c0.32			0.20			c0.03				
v/s Ratio Perm												
v/c Ratio		0.44			0.37			0.25				
Uniform Delay, d1		4.4			10.7			31.8				
Progression Factor		0.09			0.51			1.01				
Incremental Delay, d2		0.1			1.2			0.2				
Delay (s)		0.5			6.6			32.2				
Level of Service		A			A			C				
Approach Delay (s)		0.5			6.6			32.2			0.0	
Approach LOS		A			A			C			A	
Intersection Summary												
HCM 2000 Control Delay			4.9				HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			80.0				Sum of lost time (s)		18.0			
Intersection Capacity Utilization			46.8%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

Baseline Plus Project Buildout

36: Tamalpais & 4th

10/01/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑			↑				
Traffic Volume (vph)	0	370	0	0	425	50	20	5	20	0	0	0
Future Volume (vph)	0	370	0	0	425	50	20	5	20	0	0	0
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		1.00			1.00			1.00				
Frbp, ped/bikes		1.00			0.98			0.99				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.99			0.94				
Flt Protected		1.00			1.00			0.98				
Satd. Flow (prot)		1588			1537			1442				
Flt Permitted		1.00			1.00			0.98				
Satd. Flow (perm)		1588			1537			1442				
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	385	0	0	443	52	21	5	21	0	0	0
RTOR Reduction (vph)	0	0	0	0	5	0	0	18	0	0	0	0
Lane Group Flow (vph)	0	385	0	0	490	0	0	29	0	0	0	0
Confl. Peds. (#/hr)	59		21			59			10			
Turn Type		NA			NA		Split	NA				
Protected Phases		2 8			6		4	4				
Permitted Phases												
Actuated Green, G (s)		55.1			36.8			13.3				
Effective Green, g (s)		55.1			36.8			13.3				
Actuated g/C Ratio		0.69			0.46			0.17				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)		1093			707			239				
v/s Ratio Prot		c0.24			c0.32			c0.02				
v/s Ratio Perm												
v/c Ratio		0.35			0.69			0.12				
Uniform Delay, d1		5.1			17.1			28.4				
Progression Factor		0.21			0.78			1.00				
Incremental Delay, d2		0.2			5.0			0.2				
Delay (s)		1.3			18.4			28.7				
Level of Service		A			B			C				
Approach Delay (s)		1.3			18.4			28.7			0.0	
Approach LOS		A			B			C			A	
Intersection Summary												
HCM 2000 Control Delay			11.8				HCM 2000 Level of Service		B			
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			80.0				Sum of lost time (s)		17.6			
Intersection Capacity Utilization			49.2%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

Arterial Level of Service: EB 2nd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
D	IV	25	18.1	28.9	47.0	0.07	5.2	F
C	IV	25	18.9	11.8	30.7	0.07	8.4	E
B	IV	25	17.9	45.6	63.5	0.07	3.8	F
A	IV	25	18.5	13.7	32.2	0.07	7.8	E
Lindaro	IV	25	25.3	22.5	47.8	0.14	10.6	D
Lincoln	IV	25	21.4	62.3	83.7	0.10	4.2	F
Francisco W.	IV	25	12.2	35.5	47.7	0.05	3.5	F
101 SBO on 2nd	IV	25	14.2	23.6	37.8	0.05	5.1	F
Total	IV		146.5	243.9	390.4	0.61	5.7	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	50.4	69.4	0.07	3.7	F
Tamalpais	IV	25	14.4	56.9	71.3	0.05	2.7	F
Lincoln	IV	25	13.2	20.4	33.6	0.05	5.4	F
Lindaro	IV	25	21.4	2.9	24.3	0.10	14.4	C
A	IV	25	25.3	14.7	40.0	0.14	12.6	D
B	IV	25	17.9	8.8	26.7	0.07	9.1	D
C	IV	25	19.0	4.5	23.5	0.07	11.0	D
D	IV	25	18.7	2.6	21.3	0.07	11.9	D
Total	IV		148.9	161.2	310.1	0.62	7.2	E

Arterial Level of Service: SB Hetherton

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Mission	IV	29	24.0	56.4	80.4	0.16	7.2	E
5th	IV	25	16.3	3.1	19.4	0.06	11.4	D
4th	IV	25	14.6	6.2	20.8	0.05	9.5	D
3rd	IV	25	17.7	9.6	27.3	0.07	8.8	E
2nd	IV	25	15.6	75.8	91.4	0.06	2.3	F
Total	IV		88.2	151.1	239.3	0.40	6.0	F

Arterial Level of Service: NB Irwin

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
2nd St	IV	30	25.2	34.7	59.9	0.17	10.1	D
3rd St	IV	25	14.8	19.5	34.3	0.06	5.8	F
4th	IV	25	18.3	17.8	36.1	0.07	6.9	F
5th	IV	25	14.6	10.0	24.6	0.06	8.1	E
Mission	IV	25	15.7	5.9	21.6	0.06	9.9	D
Total	IV		88.6	87.9	176.5	0.41	8.3	E

Arterial Level of Service: EB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lincoln	IV	25	28.5	14.6	43.1	0.16	13.2	C
Tamalpais	IV	25	16.0	49.8	65.8	0.06	3.3	F
Tamalpais	IV	25	3.1	5.7	8.8	0.01	4.8	F
Hetherton	IV	25	8.7	10.3	19.0	0.03	6.2	F
Irwin	IV	25	18.9	14.8	33.7	0.07	7.6	E
Total	IV		75.2	95.2	170.4	0.33	7.1	E

Arterial Level of Service: WB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Irwin	IV	25	21.6	27.6	49.2	0.10	7.2	E
Hetherton	IV	25	18.9	23.3	42.2	0.07	6.1	F
Tamalpais	IV	25	8.7	115.6	124.3	0.03	1.0	F
Tamalpais	IV	25	3.1	4.7	7.8	0.01	5.4	F
Lincoln	IV	25	16.0	80.8	96.8	0.06	2.2	F
Total	IV		68.3	252.0	320.3	0.27	3.1	F

Arterial Level of Service: EB 2nd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
D	IV	25	18.1	17.6	35.7	0.07	6.9	F
C	IV	25	18.9	13.8	32.7	0.07	7.9	E
B	IV	25	17.9	15.0	32.9	0.07	7.4	E
A	IV	25	18.5	12.1	30.6	0.07	8.2	E
Lindaro	IV	25	25.3	14.7	40.0	0.14	12.6	D
Lincoln	IV	25	21.4	66.3	87.7	0.10	4.0	F
Francisco W.	IV	25	12.2	38.3	50.5	0.05	3.3	F
101 SBO on Hetherton	IV	25	14.2	83.6	97.8	0.05	2.0	F
Total	IV		146.5	261.4	407.9	0.61	5.4	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	44.6	63.6	0.07	4.1	F
Tamalpais	IV	25	14.4	55.2	69.6	0.05	2.8	F
Lincoln	IV	25	13.2	18.4	31.6	0.05	5.7	F
Lindaro	IV	25	21.4	4.7	26.1	0.10	13.4	C
A	IV	25	25.3	6.3	31.6	0.14	16.0	C
B	IV	25	17.9	7.2	25.1	0.07	9.7	D
C	IV	25	19.0	4.3	23.3	0.07	11.1	D
D	IV	25	18.7	2.9	21.6	0.07	11.7	D
Total	IV		148.9	143.6	292.5	0.62	7.7	E

Arterial Level of Service: SB Hetherton

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Mission	IV	35	22.2	37.3	59.5	0.16	9.6	D
5th	IV	25	16.3	6.8	23.1	0.06	9.6	D
4th	IV	25	14.6	7.4	22.0	0.05	9.0	E
3rd	IV	25	17.7	22.8	40.5	0.07	5.9	F
2nd	IV	25	15.6	25.7	41.3	0.06	5.1	F
Total	IV		86.4	100.0	186.4	0.40	7.7	E

Arterial Level of Service: NB Irwin

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
2nd St	IV	38	19.3	33.7	53.0	0.17	11.4	D
3rd St	IV	25	14.8	19.6	34.4	0.06	5.8	F
4th	IV	25	18.9	3.7	22.6	0.07	11.4	D
5th	IV	25	14.0	12.8	26.8	0.05	7.1	E
Mission	IV	25	15.7	3.0	18.7	0.06	11.4	D
Total	IV		82.7	72.8	155.5	0.41	9.4	D

Arterial Level of Service: EB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lincoln	IV	25	28.5	12.1	40.6	0.16	14.0	C
Tamalpais	IV	25	16.1	25.9	42.0	0.06	5.2	F
Tamalpais	IV	25	4.3	3.1	7.4	0.02	7.9	E
Hetherton	IV	25	7.5	8.0	15.5	0.03	6.6	F
Irwin	IV	25	18.9	14.4	33.3	0.07	7.7	E
Total	IV		75.3	63.5	138.8	0.33	8.7	E

Arterial Level of Service: WB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Irwin	IV	25	21.6	30.4	52.0	0.10	6.8	F
Hetherton	IV	25	18.9	8.1	27.0	0.07	9.5	D
Tamalpais	IV	25	7.5	46.6	54.1	0.03	1.9	F
Tamalpais	IV	25	4.3	2.7	7.0	0.02	8.4	E
Lincoln	IV	25	16.1	31.9	48.0	0.06	4.6	F
Total	IV		68.4	119.7	188.1	0.27	5.3	F

Leisch Method for Weaving Analysis

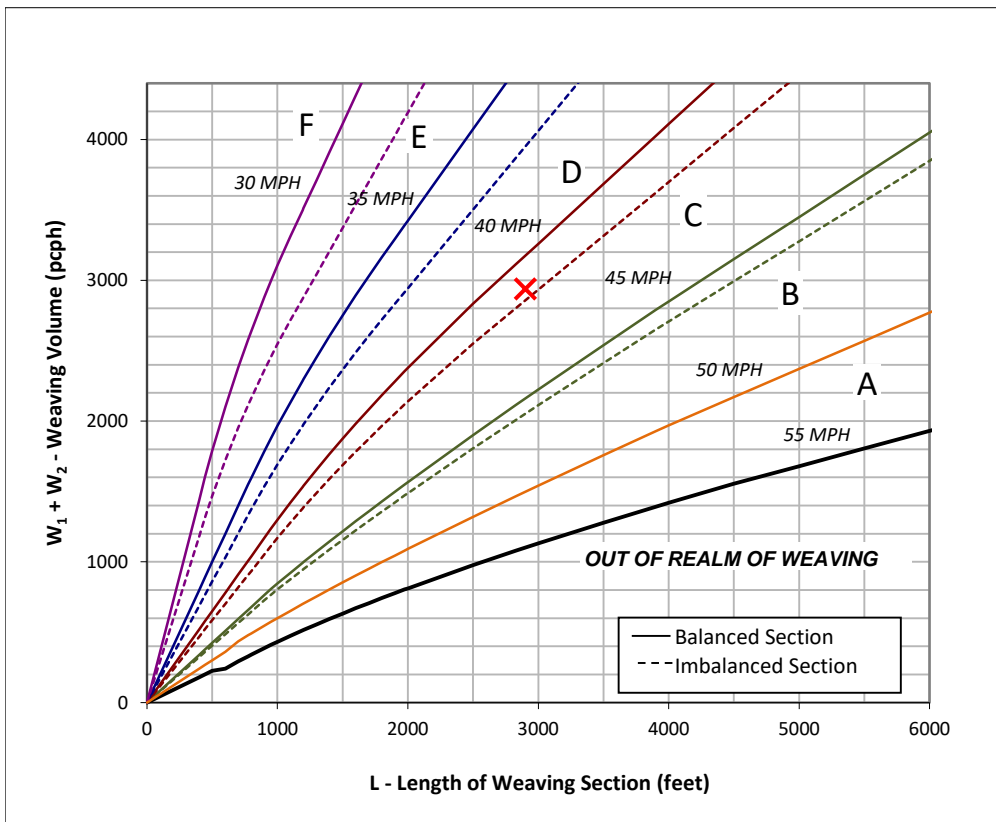
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	5
Length of Weaving Section (feet)	L	2,900

Project Information

Project	BioMarin
Scenario	Baseline + Project AM Peak Hour
Freeway	US 101 NB
On-ramp	I-580 WB
Off-ramp	Second Street

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	5,796	Volume (vph)*	1,754	Volume (vph)*	1,064
Truck Percentage	4%	Truck Percentage	4%	Truck Percentage	4%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	2.0
Volume (pcph)	6,051	Volume (pcph)	1,831	Volume (pcph)	1,108

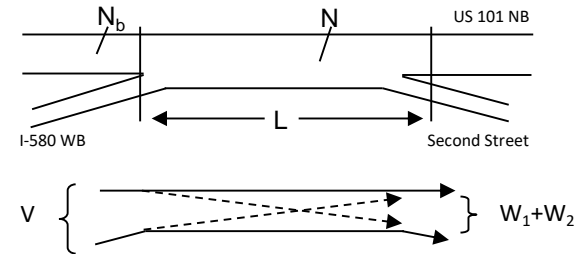


The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
35 MPH and 40 MPH
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 39.6
- Weaving Intensity Factor (k) 2.55
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,553
- Level of Service (LOS) D

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Baseline + Project Conditions
Project Description	BioMarin - US 101 NB Second Street to Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	3833	Heavy Vehicle Adjustment Factor (f_{HV})	0.919
Peak Hour Factor (PHF)	0.99	Flow Rate ($v_{p,GP}$), pc/h/ln	1404
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.61
Passenger Car Equivalent (E_T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	23.4
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	718	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	820
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.50
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.8
Speed 2 (S_2), mi/h	0.2	Density (D_{ML}), pc/mi/ln	13.7
Speed 2 (S_3), mi/h	1.4	Level of Service (LOS)	B

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Baseline + Project Conditions
Project Description	BioMarin - US 101 NB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	4	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	2.86
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	1.02
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	5621	Heavy Vehicle Adjustment Factor (f_{HV})	0.889
Peak Hour Factor (PHF)	0.99	Flow Rate ($v_{p,GP}$), pc/h/ln	1597
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.69
Passenger Car Equivalent (E_T)	3.840		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	26.6
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	2.86

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1039	Heavy Vehicle Adjustment Factor (f_{HV})	0.916
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1246
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.76
Passenger Car Equivalent (E_T)	5.597		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	58.3
Speed 2 (S_2), mi/h	1.7	Density (D_{ML}), pc/mi/ln	21.4
Speed 2 (S_3), mi/h	7.7	Level of Service (LOS)	C

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	4/24/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Baseline + Project Conditions
Project Description	BioMarin - US 101 SB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	-2.44
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	0.77
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	5863	Heavy Vehicle Adjustment Factor (f _{HV})	0.951
Peak Hour Factor (PHF)	0.97	Flow Rate (v _{p,GP}), pc/h/ln	2119
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c _{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.92
Passenger Car Equivalent (E _T)	2.180		

General Purpose Speed and Density

Lane Width Adjustment (f _{LW})	-	Average Speed (S), mi/h	55.1
Right-Side Lateral Clearance Adj. (f _{RLC})	-	Density (D _{GP}), pc/mi/ln	38.5
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS _{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1317	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.94	Flow Rate ($V_{p,ML}$), pc/h/ln	1440
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (E_T)	2.390		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	1
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	44.8
Speed 2 (S_2), mi/h	3.0	Density (D_{ML}), pc/mi/ln	32.1
Speed 2 (S_3), mi/h	12.2	Level of Service (LOS)	D

HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	3/17/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	Baseline + Project, AM Peak Hour
Project Description	BioMarin - US 101 Mission Ave Slip Off-Ramp		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	3	1
Free-Flow Speed (FFS), mi/h	60.0	50.0
Segment Length (L) / Deceleration Length (L _D), ft	1500	170
Terrain Type	Specific Grade	Specific Grade
Percent Grade, %	-2.44	-1.80
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Volume (V _i), veh/h	5863	1508
Peak Hour Factor (PHF)	0.97	0.92
Total Trucks, %	4.40	3.72
Single-Unit Trucks (SUT), %	66	66
Tractor-Trailers (TT), %	34	34
Heavy Vehicle Adjustment Factor (f _{HV})	0.951	0.958
Flow Rate (v _i), pc/h	6356	1711
Capacity (c), pc/h	6900	2100
Volume-to-Capacity Ratio (v/c)	0.92	0.81

Speed and Density

Upstream Equilibrium Distance (L _{EQ}), ft	65103.7	Density in Ramp Influence Area (D _R), pc/mi/ln	38.3
Distance to Upstream Ramp (L _{UP}), ft	10000	Speed Index (D _S)	0.387
Downstream Equilibrium Distance (L _{EQ}), ft	-	Flow Outer Lanes (v _{OA}), pc/h/ln	2220
Distance to Downstream Ramp (L _{DOWN}), ft	10000	Off-Ramp Influence Area Speed (S _R), mi/h	53.0
Prop. Freeway Vehicles in Lane 1 and 2 (P _{FD})	0.522	Outer Lanes Freeway Speed (S _O), mi/h	61.1
Flow in Lanes 1 and 2 (v ₁₂), pc/h	4136	Ramp Junction Speed (S), mi/h	55.6
Flow Entering Ramp-Infl. Area (v _{R12}), pc/h	-	Average Density (D), pc/mi/ln	38.1
Level of Service (LOS)	E		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
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Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44
Managed Lane Adjustment Factors			
Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V_{ML}), veh/h	1317	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.94	Flow Rate ($V_{p,ML}$), pc/h/ln	1440
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (E_T)	2.390		
Managed Lane Speed and Density			
Breakpoint (BP_{ML})	501	Indicator Variable	1
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	44.8
Speed 2 (S_2), mi/h	3.0	Density (D_{ML}), pc/mi/ln	32.1
Speed 2 (S_3), mi/h	12.2	Level of Service (LOS)	D

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	Baseline + Project, AM Peak Hour
Project Description	BioMarin - US 101 SB Mission Avenue to Second Street		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	4355	Heavy Vehicle Adjustment Factor (f _{HV})	0.919
Peak Hour Factor (PHF)	0.97	Flow Rate (v _{p,GP}), pc/h/ln	1628
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c _{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.71
Passenger Car Equivalent (E _T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f _{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f _{RLC})	-	Density (D _{GP}), pc/mi/ln	27.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS _{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	998	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.94	Flow Rate ($V_{p,ML}$), pc/h/ln	1104
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.67
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.0
Speed 2 (S_2), mi/h	1.0	Density (D_{ML}), pc/mi/ln	18.7
Speed 2 (S_3), mi/h	5.0	Level of Service (LOS)	C

Leisch Method for Weaving Analysis

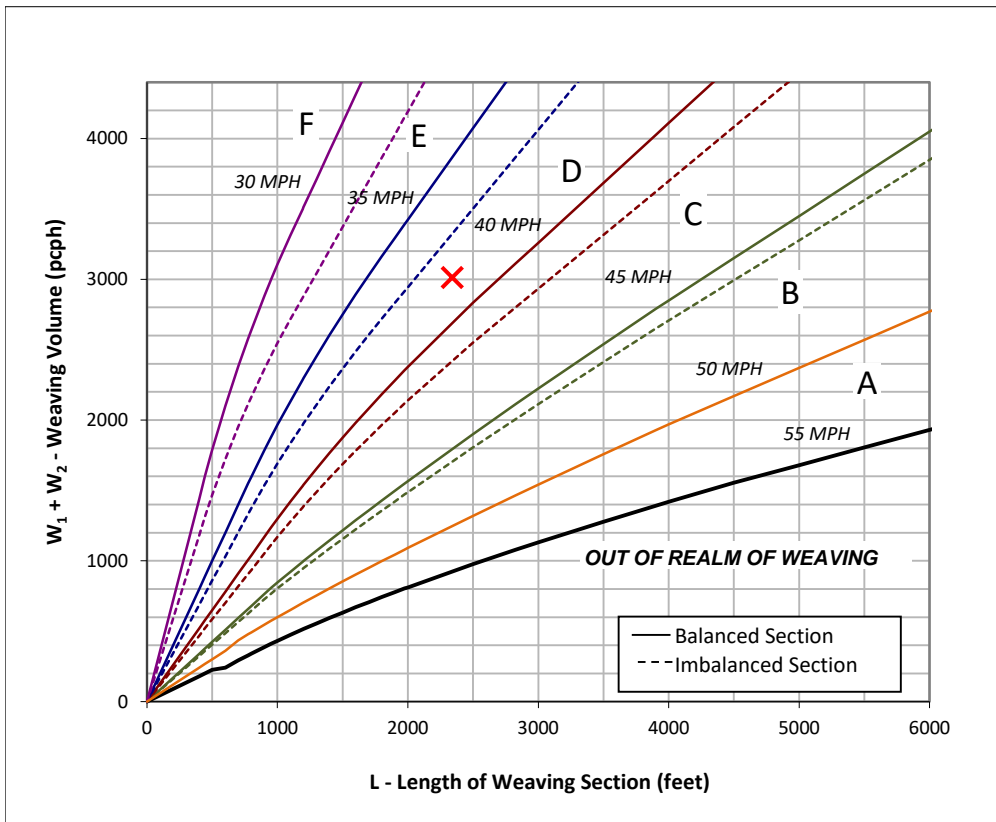
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	2,340

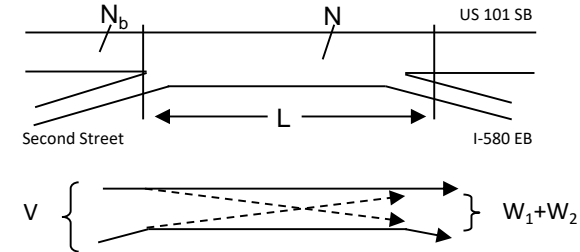
Project Information

Project	BioMarin
Scenario	Baseline + Project AM Peak Hour
Freeway	US 101 SB
On-ramp	Second Street
Off-ramp	I-580 EB

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	6,712	Volume (vph)*	1,719	Volume (vph)*	1,179
Truck Percentage	4%	Truck Percentage	3%	Truck Percentage	2%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	4.1
Volume (pcph)	7,007	Volume (pcph)	1,765	Volume (pcph)	1,249



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? **Y**
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
35 MPH and **40 MPH**
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) **38.6**
- Weaving Intensity Factor (k) **2.61**
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ **2,255**
- Level of Service (LOS) **F**

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

Leisch Method for Weaving Analysis

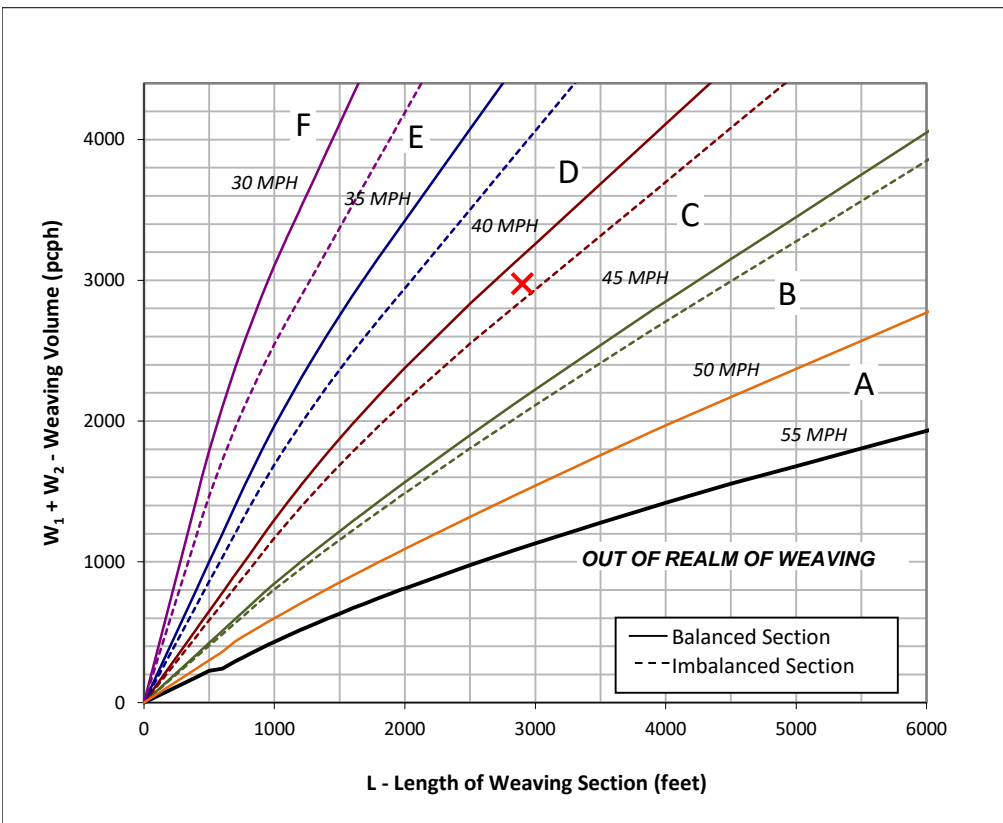
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	5
Length of Weaving Section (feet)	L	2,900

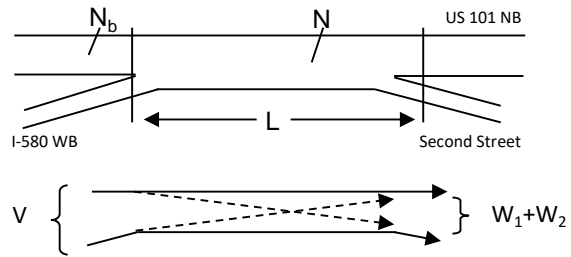
Project Information

Project	BioMarin
Scenario	Baseline + Project PM Peak Hour
Freeway	US 101 NB
On-ramp	I-580 WB
Off-ramp	Second Street

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	6,756	Volume (vph)*	1,548	Volume (vph)*	1,326
Truck Percentage	4%	Truck Percentage	4%	Truck Percentage	3%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	2.0
Volume (pcph)	7,053	Volume (pcph)	1,616	Volume (pcph)	1,361



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)?	N
<i>If optional exit lane, then "Y". Otherwise "N".</i>	
2. In the chart to the left, which two speed curves is the red "x" between?	35 MPH and 40 MPH
<i>If left of the 30 MPH curve, LOS is F. Select "-".</i>	
<i>If below the 55 MPH curve, out of the realm of weaving.</i>	
3. Interpolated Weaving Speed (S_w , mph)	39.5
4. Weaving Intensity Factor (k)	2.55
5. Service Volume (SV, pcph)	1,834
$SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$	
6. Level of Service (LOS)	E

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Baseline + Project Conditions
Project Description	BioMarin - US 101 NB Second Street to Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	4799	Heavy Vehicle Adjustment Factor (f_{HV})	0.919
Peak Hour Factor (PHF)	0.98	Flow Rate ($v_{p,GP}$), pc/h/ln	1776
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.77
Passenger Car Equivalent (E_T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	59.4
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	29.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V _{ML}), veh/h	848	Heavy Vehicle Adjustment Factor (f _{HV})	0.962
Peak Hour Factor	0.99	Flow Rate (V _{p,ML}), pc/h/ln	890
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c _{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.54
Passenger Car Equivalent (E _t)	3.000		
Managed Lane Speed and Density			
Breakpoint (BP _{ML})	501	Indicator Variable	0
Speed 1 (S ₁), mi/h	60.0	Average Speed (S _{ML}), mi/h	59.7
Speed 2 (S ₂), mi/h	0.3	Density (D _{ML}), pc/mi/ln	14.9
Speed 2 (S ₃), mi/h	2.1	Level of Service (LOS)	B

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour
Project Description	BioMarin - US 101 NB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	4	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	2.86
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	1.02
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	7017	Heavy Vehicle Adjustment Factor (f_{HV})	0.889
Peak Hour Factor (PHF)	0.98	Flow Rate ($v_{p,GP}$), pc/h/ln	2014
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.88
Passenger Car Equivalent (E_T)	3.840		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	56.9
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	35.4
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	2.86

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1217	Heavy Vehicle Adjustment Factor (f_{HV})	0.916
Peak Hour Factor	0.99	Flow Rate ($V_{p,ML}$), pc/h/ln	1342
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.81
Passenger Car Equivalent (E_T)	5.597		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	1
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	47.9
Speed 2 (S_2), mi/h	2.3	Density (D_{ML}), pc/mi/ln	28.0
Speed 2 (S_3), mi/h	9.8	Level of Service (LOS)	D

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	4/24/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Baseline + Project Conditions
Project Description	BioMarin - US 101 SB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	-2.44
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	0.77
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	5084	Heavy Vehicle Adjustment Factor (f _{HV})	0.951
Peak Hour Factor (PHF)	0.97	Flow Rate (v _{p,GP}), pc/h/ln	1837
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c _{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.80
Passenger Car Equivalent (E _T)	2.180		

General Purpose Speed and Density

Lane Width Adjustment (f _{LW})	-	Average Speed (S), mi/h	59.0
Right-Side Lateral Clearance Adj. (f _{RLC})	-	Density (D _{GP}), pc/mi/ln	31.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS _{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1377	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1555
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.94
Passenger Car Equivalent (E_T)	2.390		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	56.0
Speed 2 (S_2), mi/h	4.0	Density (D_{ML}), pc/mi/ln	27.8
Speed 2 (S_3), mi/h	15.4	Level of Service (LOS)	D

HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	4/24/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Baseline + Project Conditions
Project Description	BioMarin - US 101 Mission Ave Slip Off-Ramp		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	3	1
Free-Flow Speed (FFS), mi/h	60.0	50.0
Segment Length (L) / Deceleration Length (L _D), ft	1500	170
Terrain Type	Specific Grade	Specific Grade
Percent Grade, %	-2.44	-1.80
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Volume (V _i), veh/h	5084	1749
Peak Hour Factor (PHF)	0.97	0.96
Total Trucks, %	4.40	2.00
Single-Unit Trucks (SUT), %	66	66
Tractor-Trailers (TT), %	34	34
Heavy Vehicle Adjustment Factor (f _{HV})	0.951	0.973
Flow Rate (v _i), pc/h	5511	1872
Capacity (c), pc/h	6900	2100
Volume-to-Capacity Ratio (v/c)	0.80	0.89

Speed and Density

Upstream Equilibrium Distance (L _{EQ}), ft	102267.7	Density in Ramp Influence Area (D _R), pc/mi/ln	35.6
Distance to Upstream Ramp (L _{UP}), ft	10000	Speed Index (D _S)	0.401
Downstream Equilibrium Distance (L _{EQ}), ft	-	Flow Outer Lanes (v _{OA}), pc/h/ln	1688
Distance to Downstream Ramp (L _{DOWN}), ft	10000	Off-Ramp Influence Area Speed (S _R), mi/h	52.8
Prop. Freeway Vehicles in Lane 1 and 2 (P _{FD})	0.536	Outer Lanes Freeway Speed (S _O), mi/h	63.1
Flow in Lanes 1 and 2 (v ₁₂), pc/h	3823	Ramp Junction Speed (S), mi/h	55.6
Flow Entering Ramp-Infl. Area (v _{R12}), pc/h	-	Average Density (D), pc/mi/ln	33.0
Level of Service (LOS)	E		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44
Managed Lane Adjustment Factors			
Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V_{ML}), veh/h	1380	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1559
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.94
Passenger Car Equivalent (E_T)	2.390		
Managed Lane Speed and Density			
Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	55.9
Speed 2 (S_2), mi/h	4.1	Density (D_{ML}), pc/mi/ln	27.9
Speed 2 (S_3), mi/h	15.5	Level of Service (LOS)	D

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Baseline + Project Conditions
Project Description	BioMarin - US 101 SB Mission Avenue to Second Street		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	3335	Heavy Vehicle Adjustment Factor (f _{HV})	0.919
Peak Hour Factor (PHF)	0.97	Flow Rate (v _{p,GP}), pc/h/ln	1247
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c _{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.54
Passenger Car Equivalent (E _T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f _{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f _{RLC})	-	Density (D _{GP}), pc/mi/ln	20.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS _{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	918	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1049
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.64
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.2
Speed 2 (S_2), mi/h	0.8	Density (D_{ML}), pc/mi/ln	17.7
Speed 2 (S_3), mi/h	4.2	Level of Service (LOS)	B

Leisch Method for Weaving Analysis

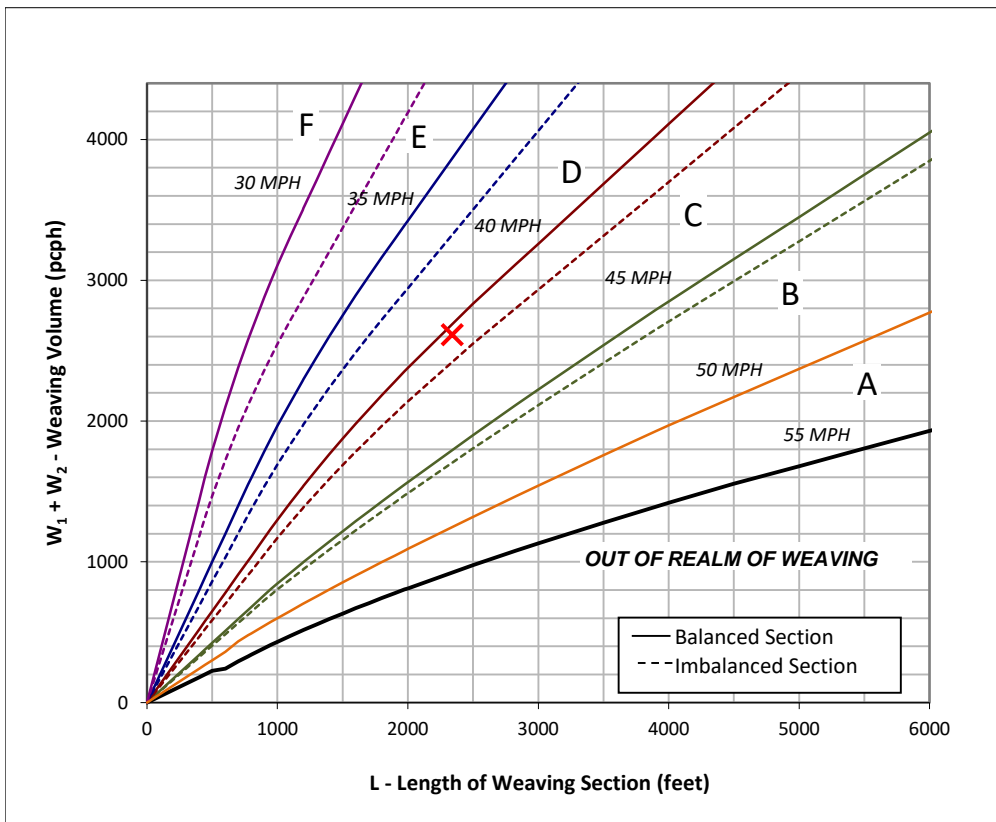
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	2,340

Project Information

Project	BioMarin
Scenario	Baseline + Project PM Peak Hour
Freeway	US 101 SB
On-ramp	Second Street
Off-ramp	I-580 EB

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	5,139	Volume (vph)*	1,040	Volume (vph)*	1,411
Truck Percentage	4%	Truck Percentage	3%	Truck Percentage	3%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	4.1
Volume (pcph)	5,365	Volume (pcph)	1,066	Volume (pcph)	1,548

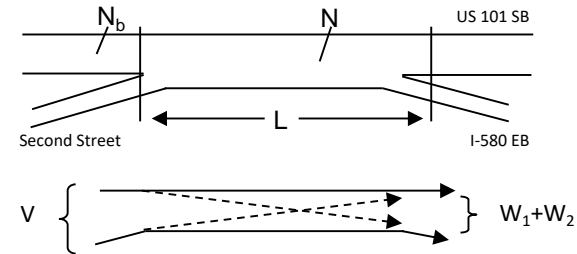


The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
40 MPH and 45 MPH
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 40.4
- Weaving Intensity Factor (k) 2.50
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,740
- Level of Service (LOS) E

Appendix E: Cumulative Conditions – Technical Calculations

Transportation Impact Study




















for BioMarin 999 3rd Street

San Rafael Campus Expansion

January 23, 2019

HCM 2010 Signalized Intersection Summary
1: Lincoln & Mission

Cumulative Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	500	20	80	585	50	20	230	90	60	415	380
Future Volume (veh/h)	120	500	20	80	585	50	20	230	90	60	415	380
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	0.99		0.97	0.99		0.94	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1660	1660	1710	1660	1660	1710	1800	1678	1728	1800	1748	1728
Adj Flow Rate, veh/h	130	543	20	87	636	50	22	250	80	65	451	204
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	2	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	148	868	32	341	626	49	68	439	134	137	831	363
Arrive On Green	0.09	0.55	0.55	0.55	0.55	0.55	0.85	0.85	0.85	0.43	0.43	0.43
Sat Flow, veh/h	1581	1588	59	787	1515	119	39	1029	314	189	1947	851
Grp Volume(v), veh/h	130	0	563	87	0	686	352	0	0	390	0	330
Grp Sat Flow(s),veh/h/ln	1581	0	1647	787	0	1634	1382	0	0	1612	0	1376
Q Serve(g_s), s	6.1	0.0	17.7	5.7	0.0	31.0	0.0	0.0	0.0	4.2	0.0	13.6
Cycle Q Clear(g_c), s	6.1	0.0	17.7	13.4	0.0	31.0	5.3	0.0	0.0	12.9	0.0	13.6
Prop In Lane	1.00		0.04	1.00		0.07	0.06		0.23	0.17		0.62
Lane Grp Cap(c), veh/h	148	0	900	341	0	676	641	0	0	744	0	587
V/C Ratio(X)	0.88	0.00	0.63	0.26	0.00	1.02	0.55	0.00	0.00	0.52	0.00	0.56
Avail Cap(c_a), veh/h	148	0	900	341	0	676	641	0	0	744	0	587
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.64	0.00	0.64	0.84	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.6	0.0	11.7	15.5	0.0	16.9	3.5	0.0	0.0	15.9	0.0	16.2
Incr Delay (d2), s/veh	47.7	0.0	3.3	1.1	0.0	31.5	2.8	0.0	0.0	2.6	0.0	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	8.8	1.3	0.0	19.5	2.3	0.0	0.0	6.5	0.0	5.8
LnGrp Delay(d),s/veh	81.3	0.0	15.0	16.7	0.0	48.4	6.4	0.0	0.0	18.6	0.0	20.1
LnGrp LOS	F		B	B		F	A			B		C
Approach Vol, veh/h		693			773			352			720	
Approach Delay, s/veh		27.4			44.8			6.4			19.3	
Approach LOS		C			D			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		45.2		36.8	10.0	35.2		36.8				
Change Period (Y+Rc), s		* 4.2		4.6	3.0	* 4.2		4.6				
Max Green Setting (Gmax), s		* 41		25.4	7.0	* 31		25.4				
Max Q Clear Time (g_c+I1), s		19.7		7.3	8.1	33.0		15.6				
Green Ext Time (p_c), s		5.5		3.1	0.0	0.0		4.4				
Intersection Summary												
HCM 2010 Ctrl Delay			27.5									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis

2: Hetherton & Mission

Cumulative Conditions
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑						↑↑	↑
Traffic Volume (vph)	0	515	90	40	230	0	0	0	0	245	1035	500
Future Volume (vph)	0	515	90	40	230	0	0	0	0	245	1035	500
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	10	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		0.95			1.00						0.95	1.00
Frbp, ped/bikes		0.99			1.00						1.00	0.97
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.98			1.00						1.00	0.85
Flt Protected		1.00			0.99						0.99	1.00
Satd. Flow (prot)		2711			1767						2960	1303
Flt Permitted		1.00			0.80						0.99	1.00
Satd. Flow (perm)		2711			1421						2960	1303
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	560	98	43	250	0	0	0	0	266	1125	543
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	639	0	0	293	0	0	0	0	0	1391	543
Confl. Peds. (#/hr)	15		22	22		15			16			1
Confl. Bikes (#/hr)			3			2			1			3
Turn Type		NA		Perm	NA					Split	NA	custom
Protected Phases		4			8					2	2	
Permitted Phases				8								5
Actuated Green, G (s)		23.8			23.8						42.4	35.4
Effective Green, g (s)		23.8			23.8						42.4	35.4
Actuated g/C Ratio		0.32			0.32						0.57	0.47
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		860			450						1673	615
v/s Ratio Prot		c0.24									c0.47	
v/s Ratio Perm					0.21							0.42
v/c Ratio		0.74			0.65						0.83	0.88
Uniform Delay, d1		22.9			22.0						13.4	17.9
Progression Factor		0.74			1.33						1.00	1.00
Incremental Delay, d2		4.8			5.6						5.0	16.7
Delay (s)		21.8			34.9						18.3	34.7
Level of Service		C			C						B	C
Approach Delay (s)		21.8			34.9			0.0			22.9	
Approach LOS		C			C			A			C	

Intersection Summary

HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	94.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

3: Irwin & Mission

Cumulative Conditions
Timing Plan: AM Peak Hour






















Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2	
Lane Configurations											
Traffic Volume (vph)	400	30	330	170	340	10	110	1140	140	40	
Future Volume (vph)	400	30	330	170	340	10	110	1140	140	40	
Ideal Flow (vphpl)	2200	1800	2200	2200	2200	1800	2200	2200	1800	2200	
Lane Width	9	12	10	10	9	12	12	12	12	12	
Total Lost time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Lane Util. Factor		1.00	1.00	1.00	1.00			0.95	1.00		
Frbp, ped/bikes		1.00	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		
Frt		1.00	1.00	1.00	0.85			1.00	0.85		
Flt Protected		0.95	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (prot)		1494	1794	1615	1471			3430	1294		
Flt Permitted		0.58	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (perm)		919	1794	1615	1471			3430	1294		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	435	33	359	185	370	11	120	1239	152	43	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	46	0	
Lane Group Flow (vph)	0	468	359	185	381	0	0	1359	149	0	
Confl. Peds. (#/hr)							13			6	
Confl. Bikes (#/hr)					2	2				2	
Parking (#/hr)				0				2			
Turn Type	pm+pt	pm+pt	NA	NA	Prot		Perm	NA	Perm		
Protected Phases	5	5	2	6	6			4			
Permitted Phases	2	2					4			4	
Actuated Green, G (s)		34.8	34.8	19.8	19.8			31.8	31.8		
Effective Green, g (s)		34.8	34.8	19.8	19.8			31.8	31.8		
Actuated g/C Ratio		0.46	0.46	0.26	0.26			0.42	0.42		
Clearance Time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0		
Lane Grp Cap (vph)		509	832	426	388			1454	548		
v/s Ratio Prot		c0.13	0.20	0.11	0.26						
v/s Ratio Perm		c0.29						0.40	0.12		
v/c Ratio		0.92	0.43	0.43	0.98			0.93	0.27		
Uniform Delay, d1		19.1	13.5	22.9	27.4			20.6	14.1		
Progression Factor		0.89	0.79	1.00	1.00			0.75	0.71		
Incremental Delay, d2		14.9	0.2	0.7	40.7			5.7	0.5		
Delay (s)		32.0	10.8	23.7	68.1			21.2	10.5		
Level of Service		C	B	C	E			C	B		
Approach Delay (s)			22.8	53.6				19.9			
Approach LOS			C	D				B			
Intersection Summary											
HCM 2000 Control Delay			27.2							HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.97								
Actuated Cycle Length (s)			75.0							Sum of lost time (s)	12.6
Intersection Capacity Utilization			93.8%							ICU Level of Service	F
Analysis Period (min)			15								
c	Critical Lane Group										

HCM 2010 Signalized Intersection Summary

4: Lincoln & 5th

Cumulative Conditions
Timing Plan: AM Peak Hour

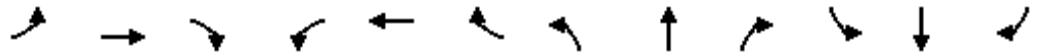
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	320	40	70	290	70	20	240	70	50	415	50
Future Volume (veh/h)	40	320	40	70	290	70	20	240	70	50	415	50
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	0.99		0.95	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1398	1545	1530	1398	1485	1530	1440	1485	1469	1440	1485	1469
Adj Flow Rate, veh/h	43	348	36	76	315	63	22	261	62	54	451	49
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	126	409	42	143	356	71	72	563	128	97	610	64
Arrive On Green	0.30	0.30	0.30	0.10	0.10	0.10	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	792	1370	142	785	1193	239	37	973	221	77	1054	110
Grp Volume(v), veh/h	43	0	384	76	0	378	345	0	0	554	0	0
Grp Sat Flow(s),veh/h/ln	792	0	1512	785	0	1432	1231	0	0	1241	0	0
Q Serve(g_s), s	2.9	0.0	17.9	4.5	0.0	19.5	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	22.4	0.0	17.9	22.4	0.0	19.5	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.09	1.00		0.17	0.06		0.18	0.10		0.09
Lane Grp Cap(c), veh/h	126	0	452	143	0	428	764	0	0	771	0	0
V/C Ratio(X)	0.34	0.00	0.85	0.53	0.00	0.88	0.45	0.00	0.00	0.72	0.00	0.00
Avail Cap(c_a), veh/h	126	0	452	143	0	428	764	0	0	771	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.94	0.00	0.94	0.86	0.00	0.00	0.39	0.00	0.00
Uniform Delay (d), s/veh	36.5	0.0	24.7	43.6	0.0	32.5	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	7.2	0.0	17.9	12.7	0.0	21.4	1.7	0.0	0.0	2.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	9.7	2.1	0.0	10.3	0.4	0.0	0.0	0.5	0.0	0.0
LnGrp Delay(d),s/veh	43.7	0.0	42.6	56.3	0.0	54.0	1.7	0.0	0.0	2.3	0.0	0.0
LnGrp LOS	D		D	E		D	A			A		
Approach Vol, veh/h		427			454			345			554	
Approach Delay, s/veh		42.7			54.3			1.7			2.3	
Approach LOS		D			D			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		27.0		48.0		27.0		48.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		22.4		43.4		22.4		43.4				
Max Q Clear Time (g_c+I1), s		24.4		2.0		24.4		2.0				
Green Ext Time (p_c), s		0.0		1.7		0.0		2.9				
Intersection Summary												
HCM 2010 Ctrl Delay			25.2									
HCM 2010 LOS			C									

HCM Signalized Intersection Capacity Analysis

5: Hetherton & 5th

Cumulative Conditions


















Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↕↕↕	↕
Traffic Volume (vph)	0	260	180	40	245	0	0	0	0	50	990	125
Future Volume (vph)	0	260	180	40	245	0	0	0	0	50	990	125
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		1.00			1.00						0.91	1.00
Frbp, ped/bikes		0.99			1.00						1.00	0.95
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.94			1.00						1.00	0.85
Flt Protected		1.00			0.99						1.00	1.00
Satd. Flow (prot)		1665			1769						4118	1127
Flt Permitted		1.00			0.90						1.00	1.00
Satd. Flow (perm)		1665			1605						4118	1127
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	283	196	43	266	0	0	0	0	54	1076	136
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	466	0	0	309	0	0	0	0	0	1130	136
Confl. Peds. (#/hr)			15	15		14			22	22		10
Confl. Bikes (#/hr)			4			2			2			2
Parking (#/hr)											2	2
Turn Type		NA		Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases				8						2		5
Actuated Green, G (s)		36.8			36.8						29.4	22.4
Effective Green, g (s)		36.8			36.8						29.4	22.4
Actuated g/C Ratio		0.49			0.49						0.39	0.30
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		816			787						1614	336
v/s Ratio Prot		c0.28										
v/s Ratio Perm					0.19						0.27	0.12
v/c Ratio		0.57			0.39						0.70	0.40
Uniform Delay, d1		13.5			12.0						19.1	21.0
Progression Factor		0.46			1.32						0.62	0.69
Incremental Delay, d2		2.8			0.8						1.4	2.0
Delay (s)		8.9			16.8						13.2	16.5
Level of Service		A			B						B	B
Approach Delay (s)		8.9			16.8			0.0			13.6	
Approach LOS		A			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			13.0								HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			75.0								Sum of lost time (s)	10.8
Intersection Capacity Utilization			85.4%								ICU Level of Service	E
Analysis Period (min)			15									
c Critical Lane Group												




















HCM 2010 Signalized Intersection Summary
6: Irwin & 5th

Cumulative Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	110	0	0	160	130	150	1180	20	0	0	0
Future Volume (veh/h)	150	110	0	0	160	130	150	1180	20	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.89	0.89	1.00	0.89			
Adj Sat Flow, veh/h/ln	1573	1573	0	0	1573	1620	1620	1573	1620			
Adj Flow Rate, veh/h	163	120	0	0	174	102	163	1283	21			
Adj No. of Lanes	1	1	0	0	1	0	0	2	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	0	3	0			
Cap, veh/h	219	491	0	0	256	150	166	1380	24			
Arrive On Green	0.10	0.10	0.00	0.00	0.31	0.31	0.19	0.19	0.19			
Sat Flow, veh/h	977	1573	0	0	819	480	294	2441	42			
Grp Volume(v), veh/h	163	120	0	0	0	276	767	0	700			
Grp Sat Flow(s),veh/h/ln	977	1573	0	0	0	1299	1385	0	1392			
Q Serve(g_s), s	9.5	5.3	0.0	0.0	0.0	13.9	41.3	0.0	36.8			
Cycle Q Clear(g_c), s	23.4	5.3	0.0	0.0	0.0	13.9	41.3	0.0	36.8			
Prop In Lane	1.00		0.00	0.00		0.37	0.21		0.03			
Lane Grp Cap(c), veh/h	219	491	0	0	0	405	783	0	787			
V/C Ratio(X)	0.74	0.24	0.00	0.00	0.00	0.68	0.98	0.00	0.89			
Avail Cap(c_a), veh/h	219	491	0	0	0	405	783	0	787			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)	0.79	0.79	0.00	0.00	0.00	1.00	0.09	0.00	0.09			
Uniform Delay (d), s/veh	41.7	25.5	0.0	0.0	0.0	22.5	30.1	0.0	28.2			
Incr Delay (d2), s/veh	10.3	0.2	0.0	0.0	0.0	4.6	5.9	0.0	1.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.0	2.3	0.0	0.0	0.0	5.5	17.1	0.0	14.6			
LnGrp Delay(d),s/veh	52.0	25.7	0.0	0.0	0.0	27.1	36.0	0.0	29.8			
LnGrp LOS	D	C				C	D		C			
Approach Vol, veh/h		283			276			1467				
Approach Delay, s/veh		40.9			27.1			33.1				
Approach LOS		D			C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		28.0		47.0		28.0						
Change Period (Y+Rc), s		4.6		4.6		4.6						
Max Green Setting (Gmax), s		23.4		42.4		23.4						
Max Q Clear Time (g_c+I1), s		25.4		43.3		15.9						
Green Ext Time (p_c), s		0.0		0.0		0.7						
Intersection Summary												
HCM 2010 Ctrl Delay				33.3								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary
7: Lincoln & 4th

Cumulative Conditions
Timing Plan: AM Peak Hour

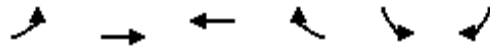
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	265	20	80	340	60	20	240	70	85	365	80
Future Volume (veh/h)	40	265	20	80	340	60	20	240	70	85	365	80
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.90	0.97		0.91	0.97		0.92	0.99		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1573	1510	1620	1573	1573	1620	1620	1573	1555	1620	1573	1555
Adj Flow Rate, veh/h	43	288	19	87	370	56	22	261	62	92	397	77
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	117	423	28	209	400	60	74	598	136	145	540	99
Arrive On Green	0.30	0.30	0.30	0.10	0.10	0.10	0.19	0.19	0.19	1.00	1.00	1.00
Sat Flow, veh/h	853	1390	92	925	1314	199	39	1024	233	153	924	170
Grp Volume(v), veh/h	43	0	307	87	0	426	345	0	0	566	0	0
Grp Sat Flow(s),veh/h/ln	853	0	1482	925	0	1513	1296	0	0	1247	0	0
Q Serve(g_s), s	1.9	0.0	13.6	7.0	0.0	20.9	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	22.8	0.0	13.6	20.6	0.0	20.9	17.1	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.13	0.06		0.18	0.16		0.14
Lane Grp Cap(c), veh/h	117	0	450	209	0	460	808	0	0	784	0	0
V/C Ratio(X)	0.37	0.00	0.68	0.42	0.00	0.93	0.43	0.00	0.00	0.72	0.00	0.00
Avail Cap(c_a), veh/h	117	0	450	209	0	460	808	0	0	784	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.92	0.00	0.92	0.84	0.00	0.00	0.50	0.00	0.00
Uniform Delay (d), s/veh	37.0	0.0	22.9	39.5	0.0	32.9	19.5	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	8.7	0.0	8.1	5.5	0.0	25.5	1.4	0.0	0.0	2.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	6.6	2.1	0.0	12.1	6.6	0.0	0.0	0.6	0.0	0.0
LnGrp Delay(d),s/veh	45.7	0.0	31.0	45.1	0.0	58.4	20.9	0.0	0.0	2.9	0.0	0.0
LnGrp LOS	D		C	D		E	C			A		
Approach Vol, veh/h		350			513			345			566	
Approach Delay, s/veh		32.8			56.1			20.9			2.9	
Approach LOS		C			E			C			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		27.0		48.0		27.0		48.0				
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2		* 4.2				
Max Green Setting (Gmax), s		* 23		* 44		* 23		* 44				
Max Q Clear Time (g_c+I1), s		24.8		19.1		22.9		2.0				
Green Ext Time (p_c), s		0.0		3.3		0.0		7.2				
Intersection Summary												
HCM 2010 Ctrl Delay				27.7								
HCM 2010 LOS				C								
Notes												

HCM Signalized Intersection Capacity Analysis

8: 4th & Tamalpais

Cumulative Conditions

Timing Plan: AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Volume (vph)	0	500	430	0	0	55
Future Volume (vph)	0	500	430	0	0	55
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.6	5.6			5.2
Lane Util. Factor		1.00	1.00			1.00
Frbp, ped/bikes		1.00	1.00			0.87
Flpb, ped/bikes		1.00	1.00			1.00
Frt		1.00	1.00			0.86
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		1573	1573			1188
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		1573	1573			1188
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	543	467	0	0	60
RTOR Reduction (vph)	0	0	0	0	0	49
Lane Group Flow (vph)	0	543	467	0	0	11
Confl. Peds. (#/hr)				39		46
Confl. Bikes (#/hr)				4		
Turn Type		NA	NA			Perm
Protected Phases		2 8	4 6			
Permitted Phases						8
Actuated Green, G (s)		50.3	50.4			13.8
Effective Green, g (s)		50.3	50.4			13.8
Actuated g/C Ratio		0.67	0.67			0.18
Clearance Time (s)						5.2
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)		1054	1057			218
v/s Ratio Prot		c0.35	c0.30			
v/s Ratio Perm						0.01
v/c Ratio		0.52	0.44			0.05
Uniform Delay, d1		6.2	5.7			25.2
Progression Factor		1.32	0.48			1.00
Incremental Delay, d2		0.3	0.2			0.1
Delay (s)		8.6	2.9			25.3
Level of Service		A	A			C
Approach Delay (s)		8.6	2.9		25.3	
Approach LOS		A	A		C	
Intersection Summary						
HCM 2000 Control Delay			7.0		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.57			
Actuated Cycle Length (s)			75.0		Sum of lost time (s)	16.4
Intersection Capacity Utilization			97.1%		ICU Level of Service	F
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
9: Hetherton & 4th


















Cumulative Conditions
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↘	↑						↑↑↑	↗
Traffic Volume (vph)	0	305	200	200	305	0	0	0	0	110	910	190
Future Volume (vph)	0	305	200	200	305	0	0	0	0	110	910	190
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	13	10	15	11	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Lane Util. Factor		1.00	1.00	1.00	1.00						0.91	1.00
Frbp, ped/bikes		1.00	0.95	1.00	1.00						1.00	0.89
Flpb, ped/bikes		1.00	1.00	0.98	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						0.99	1.00
Satd. Flow (prot)		1625	1181	1607	1520						4263	1184
Flt Permitted		1.00	1.00	0.49	1.00						0.99	1.00
Satd. Flow (perm)		1625	1181	824	1520						4263	1184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	332	217	217	332	0	0	0	0	120	989	207
RTOR Reduction (vph)	0	0	27	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	332	190	217	332	0	0	0	0	0	1109	207
Confl. Peds. (#/hr)			40	40		22			9	9		30
Confl. Bikes (#/hr)			8			4						2
Turn Type		NA	Perm	Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases			4	8						2		5
Actuated Green, G (s)		35.8	35.8	35.8	35.8						30.4	23.4
Effective Green, g (s)		35.8	35.8	35.8	35.8						30.4	23.4
Actuated g/C Ratio		0.48	0.48	0.48	0.48						0.41	0.31
Clearance Time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		775	563	393	725						1727	369
v/s Ratio Prot		0.20			0.22							
v/s Ratio Perm			0.16	0.26							0.26	0.17
v/c Ratio		0.43	0.34	0.55	0.46						0.64	0.56
Uniform Delay, d1		12.9	12.2	13.9	13.1						17.9	21.5
Progression Factor		0.49	0.42	1.04	1.07						0.34	0.45
Incremental Delay, d2		1.5	1.4	3.8	1.4						1.4	4.5
Delay (s)		7.9	6.6	18.2	15.4						7.5	14.1
Level of Service		A	A	B	B						A	B
Approach Delay (s)		7.4			16.5			0.0			8.5	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			10.1			HCM 2000 Level of Service					B	
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			75.0			Sum of lost time (s)				10.8		
Intersection Capacity Utilization			89.1%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												















HCM 2010 Signalized Intersection Summary
10: Irwin & 4th

Cumulative Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	240	0	0	380	70	130	1140	50	0	0	0
Future Volume (veh/h)	170	240	0	0	380	70	130	1140	50	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.96	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89			
Adj Sat Flow, veh/h/ln	1573	1573	0	0	1573	1620	1510	1573	1620			
Adj Flow Rate, veh/h	185	261	0	0	413	66	141	1239	50			
Adj No. of Lanes	1	1	0	0	1	0	1	2	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	137	625	0	0	465	74	706	1355	55			
Arrive On Green	0.79	0.79	0.00	0.00	0.13	0.13	0.16	0.16	0.16			
Sat Flow, veh/h	813	1573	0	0	1170	187	1438	2762	111			
Grp Volume(v), veh/h	185	261	0	0	0	479	141	670	619			
Grp Sat Flow(s),veh/h/ln	813	1573	0	0	0	1357	1438	1494	1379			
Q Serve(g_s), s	3.8	3.8	0.0	0.0	0.0	26.0	6.4	33.1	33.1			
Cycle Q Clear(g_c), s	29.8	3.8	0.0	0.0	0.0	26.0	6.4	33.1	33.1			
Prop In Lane	1.00		0.00	0.00		0.14	1.00		0.08			
Lane Grp Cap(c), veh/h	137	625	0	0	0	539	706	733	677			
V/C Ratio(X)	1.35	0.42	0.00	0.00	0.00	0.89	0.20	0.91	0.91			
Avail Cap(c_a), veh/h	137	625	0	0	0	539	706	733	677			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33			
Upstream Filter(I)	0.91	0.91	0.00	0.00	0.00	1.00	0.24	0.24	0.24			
Uniform Delay (d), s/veh	22.0	5.0	0.0	0.0	0.0	31.0	18.7	29.9	29.9			
Incr Delay (d2), s/veh	196.0	1.9	0.0	0.0	0.0	19.3	0.1	5.4	5.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	10.2	1.8	0.0	0.0	0.0	12.7	2.6	14.8	13.8			
LnGrp Delay(d),s/veh	218.1	6.9	0.0	0.0	0.0	50.2	18.8	35.2	35.7			
LnGrp LOS	F	A				D	B	D	D			
Approach Vol, veh/h		446			479			1430				
Approach Delay, s/veh		94.5			50.2			33.8				
Approach LOS		F			D			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		34.0		41.0		34.0						
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2						
Max Green Setting (Gmax), s		* 30		* 37		* 30						
Max Q Clear Time (g_c+I1), s		31.8		35.1		28.0						
Green Ext Time (p_c), s		0.0		1.1		0.4						
Intersection Summary												
HCM 2010 Ctrl Delay			48.6									
HCM 2010 LOS			D									
Notes												













HCM 2010 Signalized Intersection Summary
 11: D & 3rd

Cumulative Conditions
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	320	1220	0	0	0	0	0	240	30
Future Volume (veh/h)	0	0	0	320	1220	0	0	0	0	0	240	30
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1530	1485	0				0	1485	1530
Adj Flow Rate, veh/h				348	1326	0				0	261	17
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				586	2028	0				0	525	34
Arrive On Green				0.22	0.22	0.00				0.00	0.21	0.21
Sat Flow, veh/h				755	3123	0				0	2611	164
Grp Volume(v), veh/h				598	1076	0				0	144	134
Grp Sat Flow(s),veh/h/ln				1297	1230	0				0	1411	1290
Q Serve(g_s), s				31.7	29.8	0.0				0.0	6.8	6.9
Cycle Q Clear(g_c), s				31.7	29.8	0.0				0.0	6.8	6.9
Prop In Lane				0.58		0.00				0.00		0.13
Lane Grp Cap(c), veh/h				952	1662	0				0	292	267
V/C Ratio(X)				0.63	0.65	0.00				0.00	0.49	0.50
Avail Cap(c_a), veh/h				952	1662	0				0	440	402
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				0.68	0.68	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				21.8	21.0	0.0				0.0	26.3	26.3
Incr Delay (d2), s/veh				2.1	1.3	0.0				0.0	1.3	1.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.9	10.5	0.0				0.0	2.8	2.6
LnGrp Delay(d),s/veh				23.9	22.4	0.0				0.0	27.6	27.8
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1674						278	
Approach Delay, s/veh					22.9						27.6	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		54.9		20.1								
Change Period (Y+Rc), s		* 4.2		4.6								
Max Green Setting (Gmax), s		* 43		23.4								
Max Q Clear Time (g_c+I1), s		33.7		8.9								
Green Ext Time (p_c), s		5.6		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay				23.6								
HCM 2010 LOS				C								
Notes												


















HCM 2010 Signalized Intersection Summary
12: C & 3rd

Cumulative Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑		↑↑				
Traffic Volume (veh/h)	0	0	0	0	1415	120	110	250	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1415	120	110	250	0	0	0	0
Number				5	2	12	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.98	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1398	1398	1440	1398	0			
Adj Flow Rate, veh/h				0	1538	97	120	272	0			
Adj No. of Lanes				0	3	1	0	2	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	3	3	3	3	0			
Cap, veh/h				0	2536	774	218	404	0			
Arrive On Green				0.00	0.22	0.22	0.07	0.07	0.00			
Sat Flow, veh/h				0	3943	1164	640	1870	0			
Grp Volume(v), veh/h				0	1538	97	216	176	0			
Grp Sat Flow(s),veh/h/ln				0	1272	1164	1238	1209	0			
Q Serve(g_s), s				0.0	27.2	5.0	11.7	10.7	0.0			
Cycle Q Clear(g_c), s				0.0	27.2	5.0	12.8	10.7	0.0			
Prop In Lane				0.00		1.00	0.56		0.00			
Lane Grp Cap(c), veh/h				0	2536	774	351	270	0			
V/C Ratio(X)				0.00	0.61	0.13	0.61	0.65	0.00			
Avail Cap(c_a), veh/h				0	2536	774	421	338	0			
HCM Platoon Ratio				1.00	0.33	0.33	0.33	0.33	1.00			
Upstream Filter(I)				0.00	0.57	0.57	0.79	0.79	0.00			
Uniform Delay (d), s/veh				0.0	20.4	11.8	32.8	31.9	0.0			
Incr Delay (d2), s/veh				0.0	0.6	0.2	1.5	2.5	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	9.8	1.7	4.6	3.7	0.0			
LnGrp Delay(d),s/veh				0.0	21.1	12.0	34.3	34.4	0.0			
LnGrp LOS					C	B	C	C				
Approach Vol, veh/h					1635			392				
Approach Delay, s/veh					20.5			34.3				
Approach LOS					C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		54.0		21.0								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 46		* 21								
Max Q Clear Time (g_c+I1), s		29.2		14.8								
Green Ext Time (p_c), s		8.4		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay				23.2								
HCM 2010 LOS				C								
Notes												

















HCM 2010 Signalized Intersection Summary
13: B & 3rd

Cumulative Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  						 	
Traffic Volume (veh/h)	0	0	0	90	1470	0	0	0	0	0	200	60
Future Volume (veh/h)	0	0	0	90	1470	0	0	0	0	0	200	60
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.86
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1440	1398	0				0	1398	1440
Adj Flow Rate, veh/h				98	1598	0				0	217	45
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				165	2266	0				0	486	97
Arrive On Green				0.21	0.21	0.00				0.00	0.24	0.24
Sat Flow, veh/h				170	3616	0				0	2091	401
Grp Volume(v), veh/h				630	1066	0				0	139	123
Grp Sat Flow(s),veh/h/ln				1356	1158	0				0	1328	1094
Q Serve(g_s), s				23.1	32.0	0.0				0.0	6.7	7.2
Cycle Q Clear(g_c), s				32.3	32.0	0.0				0.0	6.7	7.2
Prop In Lane				0.16		0.00				0.00		0.37
Lane Grp Cap(c), veh/h				933	1499	0				0	320	263
V/C Ratio(X)				0.68	0.71	0.00				0.00	0.44	0.47
Avail Cap(c_a), veh/h				933	1499	0				0	411	338
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				0.69	0.69	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				23.0	23.0	0.0				0.0	24.2	24.3
Incr Delay (d2), s/veh				2.7	2.0	0.0				0.0	0.9	1.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				12.9	10.7	0.0				0.0	2.5	2.3
LnGrp Delay(d),s/veh				25.7	25.0	0.0				0.0	25.1	25.6
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1696						262	
Approach Delay, s/veh					25.3						25.3	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		52.7		22.3								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 43		* 23								
Max Q Clear Time (g_c+I1), s		34.3		9.2								
Green Ext Time (p_c), s		5.6		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay				25.3								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary
14: A & 3rd

Cumulative Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	40	1310	80	210	135	0	0	140	30
Future Volume (veh/h)	0	0	0	40	1310	80	210	135	0	0	140	30
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	0.96		1.00	1.00		0.92
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1800	1748	1800	1835	1835	0	0	1835	1890
Adj Flow Rate, veh/h				43	1424	78	228	147	0	0	152	21
Adj No. of Lanes				0	3	0	1	1	0	0	1	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	3	0	3	3	0	0	3	3
Cap, veh/h				73	2568	145	303	606	0	0	302	42
Arrive On Green				0.18	0.18	0.18	0.02	0.11	0.00	0.00	0.22	0.22
Sat Flow, veh/h				131	4617	262	1748	1835	0	0	1389	192
Grp Volume(v), veh/h				570	474	500	228	147	0	0	0	173
Grp Sat Flow(s),veh/h/ln				1741	1590	1678	1748	1835	0	0	0	1581
Q Serve(g_s), s				22.5	20.2	20.3	0.6	5.5	0.0	0.0	0.0	7.2
Cycle Q Clear(g_c), s				22.5	20.2	20.3	0.6	5.5	0.0	0.0	0.0	7.2
Prop In Lane				0.08		0.16	1.00		0.00	0.00		0.12
Lane Grp Cap(c), veh/h				968	885	934	303	606	0	0	0	344
V/C Ratio(X)				0.59	0.54	0.54	0.75	0.24	0.00	0.00	0.00	0.50
Avail Cap(c_a), veh/h				968	885	934	443	807	0	0	0	390
HCM Platoon Ratio				0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	0.84	0.84	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				22.8	21.9	21.9	33.1	24.8	0.0	0.0	0.0	25.8
Incr Delay (d2), s/veh				2.6	2.3	2.2	6.8	0.4	0.0	0.0	0.0	2.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.5	9.5	10.0	5.2	2.9	0.0	0.0	0.0	3.4
LnGrp Delay(d),s/veh				25.4	24.2	24.1	40.0	25.2	0.0	0.0	0.0	28.2
LnGrp LOS				C	C	C	D	C				C
Approach Vol, veh/h					1545			375			173	
Approach Delay, s/veh					24.6			34.2			28.2	
Approach LOS					C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			8.0	20.8		46.2		28.8				
Change Period (Y+Rc), s			4.0	4.5		4.5		4.0				
Max Green Setting (Gmax), s			10.0	18.5		33.5		33.0				
Max Q Clear Time (g_c+I1), s			2.6	9.2		24.5		7.5				
Green Ext Time (p_c), s			1.0	0.8		7.2		1.1				
Intersection Summary												
HCM 2010 Ctrl Delay				26.6								
HCM 2010 LOS				C								

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

BioMarin
Cumulative Conditions
AM Peak Hour

Intersection 15 Brooks St/3rd St Side-street Stop
















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	20	20	97.5%	13.5	7.9	B
	Through						
	Right Turn						
	Subtotal	20	20	97.5%	13.5	7.9	B
SB	Left Turn						
	Through						
	Right Turn	10	11	106.7%	13.4	6.9	B
	Subtotal	10	11	106.7%	13.4	6.9	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	30	26	87.1%	2.4	0.5	A
	Through	1,400	1,346	96.2%	1.6	0.2	A
	Right Turn	10	13	128.8%	1.1	0.1	A
	Subtotal	1,440	1,385	96.2%	1.6	0.2	A
Total		1,470	1,415	96.3%	1.8	0.1	A

Intersection 16 Lindaro St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	80	80	99.8%	27.3	6.9	C
	Through	10	10	95.7%	26.2	15.1	C
	Right Turn						
	Subtotal	90	89	99.4%	27.6	7.2	C
SB	Left Turn						
	Through	40	42	104.0%	35.3	11.1	D
	Right Turn	10	10	99.4%	13.4	10.6	B
	Subtotal	50	52	103.0%	31.3	10.2	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	340	324	95.2%	9.0	2.8	A
	Through	1,365	1,312	96.1%	5.8	0.9	A
	Right Turn	30	30	99.4%	6.1	2.5	A
	Subtotal	1,735	1,666	96.0%	6.4	1.1	A
Total		1,875	1,807	96.3%	8.2	0.9	A


















HCM 2010 Signalized Intersection Summary
17: Lincoln & 3rd

Cumulative Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	175	1615	75	40	195	0	0	290	160
Future Volume (veh/h)	0	0	0	175	1615	75	40	195	0	0	290	160
Number				1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.91	1.00		1.00	1.00		0.92
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Adj Sat Flow, veh/h/ln				1620	1573	1620	1620	1573	0	0	1510	1555
Adj Flow Rate, veh/h				190	1755	75	43	212	0	0	315	172
Adj No. of Lanes				0	3	0	0	1	0	0	1	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	3	0	3	3	0	0	3	3
Cap, veh/h				178	1757	77	67	249	0	0	342	187
Arrive On Green				0.15	0.15	0.15	0.14	0.14	0.00	0.00	0.29	0.29
Sat Flow, veh/h				399	3934	173	24	574	0	0	788	431
Grp Volume(v), veh/h				740	619	661	255	0	0	0	0	487
Grp Sat Flow(s),veh/h/ln				1553	1431	1521	598	0	0	0	0	1219
Q Serve(g_s), s				33.5	32.3	32.5	3.2	0.0	0.0	0.0	0.0	29.0
Cycle Q Clear(g_c), s				33.5	32.3	32.5	32.3	0.0	0.0	0.0	0.0	29.0
Prop In Lane				0.26		0.11	0.17		0.00	0.00		0.35
Lane Grp Cap(c), veh/h				694	639	679	315	0	0	0	0	528
V/C Ratio(X)				1.07	0.97	0.97	0.81	0.00	0.00	0.00	0.00	0.92
Avail Cap(c_a), veh/h				694	639	679	315	0	0	0	0	528
HCM Platoon Ratio				0.33	0.33	0.33	0.33	0.33	1.00	1.00	0.67	0.67
Upstream Filter(I)				0.37	0.37	0.37	1.00	0.00	0.00	0.00	0.00	0.45
Uniform Delay (d), s/veh				32.0	31.4	31.5	26.5	0.0	0.0	0.0	0.0	25.4
Incr Delay (d2), s/veh				41.1	15.0	15.2	19.7	0.0	0.0	0.0	0.0	13.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				22.3	15.4	16.5	7.0	0.0	0.0	0.0	0.0	11.7
LnGrp Delay(d),s/veh				73.1	46.4	46.8	46.2	0.0	0.0	0.0	0.0	38.5
LnGrp LOS				F	D	D	D					D
Approach Vol, veh/h					2020			255			487	
Approach Delay, s/veh					56.3			46.2			38.5	
Approach LOS					E			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				37.0		38.0		37.0				
Change Period (Y+Rc), s				4.5		4.5		4.5				
Max Green Setting (Gmax), s				32.5		33.5		32.5				
Max Q Clear Time (g_c+I1), s				34.3		35.5		31.0				
Green Ext Time (p_c), s				0.0		0.0		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				52.2								
HCM 2010 LOS				D								

HCM Signalized Intersection Capacity Analysis
 18: Tamalpais & 3rd


















Cumulative Conditions
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  							
Traffic Volume (vph)	0	0	0	295	1800	30	50	50	0	0	0	0
Future Volume (vph)	0	0	0	295	1800	30	50	50	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1600	1600	1600	1600	1600	1800	1800	1600	1600
Lane Width	12	12	12	12	12	12	11	12	12	12	12	12
Total Lost time (s)					11.6		7.6	7.6				
Lane Util. Factor					0.91		1.00	1.00				
Frbp, ped/bikes					1.00		1.00	1.00				
Flpb, ped/bikes					0.98		0.93	1.00				
Frt					1.00		1.00	1.00				
Flt Protected					0.99		0.95	1.00				
Satd. Flow (prot)					3690		1057	1237				
Flt Permitted					0.99		0.95	1.00				
Satd. Flow (perm)					3690		1057	1237				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	321	1957	33	54	54	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	2309	0	54	54	0	0	0	0
Confl. Peds. (#/hr)			73	73		38	49		63			49
Confl. Bikes (#/hr)						2			2			2
Parking (#/hr)							3	3			3	3
Turn Type				Perm	NA		Perm	NA				
Protected Phases					6			4				
Permitted Phases				6			4					
Actuated Green, G (s)					51.8		19.0	19.0				
Effective Green, g (s)					51.8		19.0	19.0				
Actuated g/C Ratio					0.58		0.21	0.21				
Clearance Time (s)					11.6		7.6	7.6				
Vehicle Extension (s)					5.0		5.0	5.0				
Lane Grp Cap (vph)					2123		223	261				
v/s Ratio Prot								0.04				
v/s Ratio Perm					0.63		c0.05					
v/c Ratio					1.09		0.24	0.21				
Uniform Delay, d1					19.1		29.5	29.3				
Progression Factor					1.00		1.00	1.00				
Incremental Delay, d2					48.1		1.2	0.8				
Delay (s)					67.2		30.7	30.1				
Level of Service					E		C	C				
Approach Delay (s)		0.0			67.2			30.4			0.0	
Approach LOS		A			E			C			A	
Intersection Summary												
HCM 2000 Control Delay			65.6		HCM 2000 Level of Service				E			
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)				19.2			
Intersection Capacity Utilization			145.9%		ICU Level of Service				H			
Analysis Period (min)			15									

c Critical Lane Group













HCM 2010 Signalized Intersection Summary
19: Hetherton & 3rd

Cumulative Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	455	1590	0	0	0	0	0	825	485
Future Volume (veh/h)	0	0	0	455	1590	0	0	0	0	0	825	485
Number				1	6	16				3	8	18
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.84
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1545	1573	0				0	1573	1485
Adj Flow Rate, veh/h				495	1728	0				0	897	518
Adj No. of Lanes				1	3	0				0	3	1
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				730	2033	0				0	1929	474
Arrive On Green				0.14	0.14	0.00				0.00	0.15	0.15
Sat Flow, veh/h				1471	4718	0				0	4435	1055
Grp Volume(v), veh/h				495	1728	0				0	897	518
Grp Sat Flow(s),veh/h/ln				1471	1573	0				0	1431	1055
Q Serve(g_s), s				24.3	26.8	0.0				0.0	14.3	33.7
Cycle Q Clear(g_c), s				24.3	26.8	0.0				0.0	14.3	33.7
Prop In Lane				1.00		0.00				0.00		1.00
Lane Grp Cap(c), veh/h				730	2033	0				0	1929	474
V/C Ratio(X)				0.68	0.85	0.00				0.00	0.47	1.09
Avail Cap(c_a), veh/h				743	2076	0				0	1929	474
HCM Platoon Ratio				0.33	0.33	1.00				1.00	0.33	0.33
Upstream Filter(l)				0.24	0.24	0.00				0.00	0.78	0.78
Uniform Delay (d), s/veh				28.8	29.8	0.0				0.0	23.7	31.9
Incr Delay (d2), s/veh				0.6	0.9	0.0				0.0	0.6	64.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.0	11.8	0.0				0.0	5.8	18.3
LnGrp Delay(d),s/veh				29.3	30.7	0.0				0.0	24.3	96.5
LnGrp LOS				C	C						C	F
Approach Vol, veh/h					2223						1415	
Approach Delay, s/veh					30.4						50.7	
Approach LOS					C						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs						6		8				
Phs Duration (G+Y+Rc), s						36.3		38.7				
Change Period (Y+Rc), s						4.0		5.0				
Max Green Setting (Gmax), s						33.0		33.0				
Max Q Clear Time (g_c+I1), s						28.8		35.7				
Green Ext Time (p_c), s						3.5		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay					38.3							
HCM 2010 LOS					D							
Notes												
User approved volume balancing among the lanes for turning movement.												




















HCM 2010 Signalized Intersection Summary
20: Irwin & 3rd/3rd St

Cumulative Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑	↑	↑↑↑				
Traffic Volume (veh/h)	0	0	0	0	1095	120	960	1205	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1095	120	960	1205	0	0	0	0
Number				1	6	16	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.94	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1485	1485	1398	1398	0			
Adj Flow Rate, veh/h				0	1190	104	1043	1310	0			
Adj No. of Lanes				0	3	1	2	2	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	3	3	3	3	0			
Cap, veh/h				0	1329	388	1470	1544	0			
Arrive On Green				0.00	0.33	0.33	0.18	0.18	0.00			
Sat Flow, veh/h				0	4189	1184	2663	2796	0			
Grp Volume(v), veh/h				0	1190	104	1043	1310	0			
Grp Sat Flow(s),veh/h/ln				0	1352	1184	1331	1398	0			
Q Serve(g_s), s				0.0	20.9	4.9	27.6	34.0	0.0			
Cycle Q Clear(g_c), s				0.0	20.9	4.9	27.6	34.0	0.0			
Prop In Lane				0.00		1.00	1.00		0.00			
Lane Grp Cap(c), veh/h				0	1329	388	1470	1544	0			
V/C Ratio(X)				0.00	0.90	0.27	0.71	0.85	0.00			
Avail Cap(c_a), veh/h				0	1379	403	1470	1544	0			
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	0.09	0.09	0.00			
Uniform Delay (d), s/veh				0.0	24.0	18.6	25.0	27.6	0.0			
Incr Delay (d2), s/veh				0.0	7.8	0.4	0.3	0.6	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	8.8	1.6	10.3	13.3	0.0			
LnGrp Delay(d),s/veh				0.0	31.8	18.9	25.3	28.2	0.0			
LnGrp LOS					C	B	C	C				
Approach Vol, veh/h					1294			2353				
Approach Delay, s/veh					30.7			26.9				
Approach LOS					C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				45.9		29.1						
Change Period (Y+Rc), s				4.5		4.5						
Max Green Setting (Gmax), s				40.5		25.5						
Max Q Clear Time (g_c+I1), s				36.0		22.9						
Green Ext Time (p_c), s				3.9		1.6						
Intersection Summary												
HCM 2010 Ctrl Delay				28.3								
HCM 2010 LOS				C								
Notes												


















HCM 2010 Signalized Intersection Summary
21: D & 2nd

Cumulative Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  								 		
Traffic Volume (veh/h)	0	2050	90	0	0	0	0	0	270	80	475	0
Future Volume (veh/h)	0	2050	90	0	0	0	0	0	270	80	475	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1660	1710				0	1573	1620	1748	1748	0
Adj Flow Rate, veh/h	0	2228	91				0	0	277	87	516	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	0	0	0				0	0	420	246	565	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.32	0.11	0.11	0.00
Sat Flow, veh/h		0					0	0	1300	1072	1748	0
Grp Volume(v), veh/h		0.0					0	0	277	87	516	0
Grp Sat Flow(s),veh/h/ln							0	0	1300	1072	1748	0
Q Serve(g_s), s							0.0	0.0	13.7	6.0	21.9	0.0
Cycle Q Clear(g_c), s							0.0	0.0	13.7	19.7	21.9	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	420	246	565	0
V/C Ratio(X)							0.00	0.00	0.66	0.35	0.91	0.00
Avail Cap(c_a), veh/h							0	0	440	263	592	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(l)							0.00	0.00	1.00	0.86	0.86	0.00
Uniform Delay (d), s/veh							0.0	0.0	21.8	38.2	32.5	0.0
Incr Delay (d2), s/veh							0.0	0.0	2.6	0.3	15.7	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	5.2	1.8	13.1	0.0
LnGrp Delay(d),s/veh							0.0	0.0	24.4	38.5	48.2	0.0
LnGrp LOS									C	D	D	
Approach Vol, veh/h								277			603	
Approach Delay, s/veh								24.4			46.8	
Approach LOS								C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				28.8				28.8				
Change Period (Y+Rc), s				4.6				4.6				
Max Green Setting (Gmax), s				25.4				25.4				
Max Q Clear Time (g_c+I1), s				23.9				15.7				
Green Ext Time (p_c), s				0.3				0.6				
Intersection Summary												
HCM 2010 Ctrl Delay			39.8									
HCM 2010 LOS			D									













HCM 2010 Signalized Intersection Summary
 22: C & 2nd

Cumulative Conditions
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						 				
Traffic Volume (veh/h)	110	2290	0	0	0	0	0	225	100	0	0	0
Future Volume (veh/h)	110	2290	0	0	0	0	0	225	100	0	0	0
Number	1	6	16				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1440	1485	0				0	1485	1440			
Adj Flow Rate, veh/h	120	2489	0				0	245	107			
Adj No. of Lanes	0	3	0				0	2	0			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0				0	3	3			
Cap, veh/h	166	2789	0				0	361	152			
Arrive On Green	0.23	0.23	0.00				0.00	0.18	0.18			
Sat Flow, veh/h	160	3989	0				0	1966	827			
Grp Volume(v), veh/h	923	1686	0				0	183	169			
Grp Sat Flow(s),veh/h/ln	1445	1352	0				0	1485	1308			
Q Serve(g_s), s	39.1	45.3	0.0				0.0	8.6	9.1			
Cycle Q Clear(g_c), s	46.6	45.3	0.0				0.0	8.6	9.1			
Prop In Lane	0.13		0.00				0.00		0.63			
Lane Grp Cap(c), veh/h	1065	1890	0				0	273	240			
V/C Ratio(X)	0.87	0.89	0.00				0.00	0.67	0.70			
Avail Cap(c_a), veh/h	1065	1890	0				0	412	363			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	0.17	0.17	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	26.5	26.1	0.0				0.0	28.5	28.7			
Incr Delay (d2), s/veh	1.8	1.3	0.0				0.0	6.0	7.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	19.3	17.3	0.0				0.0	4.0	3.8			
LnGrp Delay(d),s/veh	28.3	27.4	0.0				0.0	34.5	36.5			
LnGrp LOS	C	C						C	D			
Approach Vol, veh/h		2609						352				
Approach Delay, s/veh		27.7						35.5				
Approach LOS		C						D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				18.0		57.0						
Change Period (Y+Rc), s				* 4.2		4.6						
Max Green Setting (Gmax), s				* 21		45.4						
Max Q Clear Time (g_c+I1), s				11.1		48.6						
Green Ext Time (p_c), s				2.0		0.0						
Intersection Summary												
HCM 2010 Ctrl Delay			28.6									
HCM 2010 LOS			C									
Notes												

























HCM 2010 Signalized Intersection Summary
23: B & 2nd

Cumulative Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑		↑	↑	
Traffic Volume (veh/h)	0	2315	70	0	0	0	0	0	170	70	230	0
Future Volume (veh/h)	0	2315	70	0	0	0	0	0	170	70	230	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.93	0.97		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1485	1382				0	1573	1591	1545	1485	0
Adj Flow Rate, veh/h	0	2516	72				0	0	165	76	250	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	0	0	0				0	0	291	216	346	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.23	0.08	0.08	0.00
Sat Flow, veh/h		0					0	0	1247	1036	1485	0
Grp Volume(v), veh/h		0.0					0	0	165	76	250	0
Grp Sat Flow(s),veh/h/ln							0	0	1247	1036	1485	0
Q Serve(g_s), s							0.0	0.0	8.8	5.4	12.3	0.0
Cycle Q Clear(g_c), s							0.0	0.0	8.8	14.2	12.3	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	291	216	346	0
V/C Ratio(X)							0.00	0.00	0.57	0.35	0.72	0.00
Avail Cap(c_a), veh/h							0	0	357	272	426	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	0.90	0.90	0.00
Uniform Delay (d), s/veh							0.0	0.0	25.4	37.4	32.2	0.0
Incr Delay (d2), s/veh							0.0	0.0	0.7	0.3	2.8	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	3.1	1.6	5.3	0.0
LnGrp Delay(d),s/veh							0.0	0.0	26.1	37.7	35.1	0.0
LnGrp LOS									C	D	D	
Approach Vol, veh/h								165			326	
Approach Delay, s/veh								26.1			35.7	
Approach LOS								C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				22.0				22.0				
Change Period (Y+Rc), s				4.5				4.5				
Max Green Setting (Gmax), s				21.5				21.5				
Max Q Clear Time (g_c+I1), s				16.2				10.8				
Green Ext Time (p_c), s				0.4				0.3				
Intersection Summary												
HCM 2010 Ctrl Delay				32.5								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary
24: A & 2nd

Cumulative Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						  		  	  	
Traffic Volume (veh/h)	100	2240	205	0	0	0	0	260	20	50	125	0
Future Volume (veh/h)	100	2240	205	0	0	0	0	260	20	50	125	0
Number	5	2	12				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97				1.00		0.95	0.98		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1748	1800				0	1660	1710	1660	1660	0
Adj Flow Rate, veh/h	109	2435	210				0	283	13	54	136	0
Adj No. of Lanes	0	3	0				0	2	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	124	2928	255				0	448	20	156	366	0
Arrive On Green	0.22	0.22	0.22				0.00	0.15	0.15	0.01	0.07	0.00
Sat Flow, veh/h	188	4420	384				0	3147	140	1581	1660	0
Grp Volume(v), veh/h	1009	836	909				0	145	151	54	136	0
Grp Sat Flow(s),veh/h/ln	1738	1590	1664				0	1577	1627	1581	1660	0
Q Serve(g_s), s	42.1	37.3	39.1				0.0	6.5	6.6	0.0	5.9	0.0
Cycle Q Clear(g_c), s	42.1	37.3	39.1				0.0	6.5	6.6	0.0	5.9	0.0
Prop In Lane	0.11		0.23				0.00		0.09	1.00		0.00
Lane Grp Cap(c), veh/h	1152	1054	1102				0	231	238	156	366	0
V/C Ratio(X)	0.88	0.79	0.82				0.00	0.63	0.64	0.35	0.37	0.00
Avail Cap(c_a), veh/h	1152	1054	1102				0	336	347	170	487	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(l)	0.09	0.09	0.09				0.00	1.00	1.00	0.81	0.81	0.00
Uniform Delay (d), s/veh	26.3	24.5	25.1				0.0	30.1	30.1	35.9	29.8	0.0
Incr Delay (d2), s/veh	1.0	0.6	0.7				0.0	5.9	5.9	2.3	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.6	16.6	18.3				0.0	3.2	3.3	1.2	2.8	0.0
LnGrp Delay(d),s/veh	27.3	25.0	25.8				0.0	36.0	36.0	38.2	30.9	0.0
LnGrp LOS	C	C	C					D	D	D	C	
Approach Vol, veh/h		2754						296			190	
Approach Delay, s/veh		26.1						36.0			33.0	
Approach LOS		C						D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		54.3		20.7			5.6	15.2				
Change Period (Y+Rc), s		4.6		* 4.2			* 4.2	* 4.2				
Max Green Setting (Gmax), s		44.2		* 22			* 2	* 16				
Max Q Clear Time (g_c+I1), s		44.1		7.9			2.0	8.6				
Green Ext Time (p_c), s		0.1		0.8			0.0	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			27.4									
HCM 2010 LOS			C									
Notes												

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

BioMarin
Cumulative Conditions
AM Peak Hour

Intersection 25 Brooks St/2nd St Side-street Stop



















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	30	26	85.9%	21.2	10.6	C
	Through						
	Right Turn						
	Subtotal	30	26	85.9%	21.2	10.6	C
EB	Left Turn	20	19	95.7%	3.0	0.8	A
	Through	2,295	2,253	98.1%	2.4	0.2	A
	Right Turn						
	Subtotal	2,315	2,272	98.1%	2.4	0.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,345	2,297	98.0%	2.6	0.3	A

Intersection 26 Lindero St/2nd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	50	53	106.7%	20.7	3.7	C
	Right Turn	270	272	100.6%	22.7	4.6	C
	Subtotal	320	325	101.5%	22.5	4.0	C
SB	Left Turn	70	69	98.3%	33.1	3.2	C
	Through	310	300	96.6%	29.9	4.2	C
	Right Turn						
	Subtotal	380	368	96.9%	30.6	3.4	C
EB	Left Turn	40	37	92.9%	12.3	3.7	B
	Through	2,275	2,222	97.7%	10.5	1.0	B
	Right Turn	50	52	104.5%	9.0	2.3	A
	Subtotal	2,365	2,311	97.7%	10.5	1.1	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,065	3,004	98.0%	14.3	1.4	B






















HCM 2010 Signalized Intersection Summary
27: Lincoln & 2nd

Cumulative Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	2435	40	0	0	0	0	110	50	140	270	0
Future Volume (veh/h)	140	2435	40	0	0	0	0	110	50	140	270	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1398	1398				0	1398	1398	1382	1342	0
Adj Flow Rate, veh/h	152	2647	26				0	120	41	152	293	0
Adj No. of Lanes	0	4	1				0	1	1	0	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	147	2755	657				0	429	352	245	458	0
Arrive On Green	0.19	0.19	0.19				0.00	0.31	0.31	0.10	0.10	0.00
Sat Flow, veh/h	253	4739	1130				0	1398	1149	539	1556	0
Grp Volume(v), veh/h	832	1967	26				0	120	41	230	215	0
Grp Sat Flow(s),veh/h/ln	1385	1202	1130				0	1398	1149	874	1160	0
Q Serve(g_s), s	43.6	40.3	1.4				0.0	4.9	1.9	15.1	13.3	0.0
Cycle Q Clear(g_c), s	43.6	40.3	1.4				0.0	4.9	1.9	20.0	13.3	0.0
Prop In Lane	0.18		1.00				0.00		1.00	0.66		0.00
Lane Grp Cap(c), veh/h	805	2097	657				0	429	352	348	356	0
V/C Ratio(X)	1.03	0.94	0.04				0.00	0.28	0.12	0.66	0.61	0.00
Avail Cap(c_a), veh/h	805	2097	657				0	500	411	400	415	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	0.26	0.26	0.26				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.3	29.0	13.3				0.0	19.7	18.7	33.8	29.4	0.0
Incr Delay (d2), s/veh	25.4	3.0	0.0				0.0	0.4	0.1	3.3	1.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	22.4	14.0	0.4				0.0	1.9	0.6	5.0	4.5	0.0
LnGrp Delay(d),s/veh	55.7	32.0	13.3				0.0	20.1	18.8	37.1	31.3	0.0
LnGrp LOS	F	C	B					C	B	D	C	
Approach Vol, veh/h		2825						161			445	
Approach Delay, s/veh		38.8						19.8			34.3	
Approach LOS		D						B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		47.8		27.2				27.2				
Change Period (Y+Rc), s		* 4.2		* 4.2				* 4.2				
Max Green Setting (Gmax), s		* 40		* 27				* 27				
Max Q Clear Time (g_c+I1), s		45.6		6.9				22.0				
Green Ext Time (p_c), s		0.0		0.6				0.9				
Intersection Summary												
HCM 2010 Ctrl Delay			37.3									
HCM 2010 LOS			D									
Notes												

















HCM 2010 Signalized Intersection Summary
 28: Francisco W./Tamalpais & 2nd

Cumulative Conditions
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		   										
Traffic Volume (veh/h)	50	2490	70	0	0	0	0	50	270	100	200	0
Future Volume (veh/h)	50	2490	70	0	0	0	0	50	270	100	200	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1398	1398				0	1398	1454	1398	1398	0
Adj Flow Rate, veh/h	54	2707	48				0	54	254	109	217	0
Adj No. of Lanes	0	4	1				0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	53	2866	633				0	339	292	275	339	0
Arrive On Green	0.19	0.19	0.19				0.00	0.24	0.24	0.08	0.08	0.00
Sat Flow, veh/h	91	4909	1084				0	1398	1204	845	1398	0
Grp Volume(v), veh/h	823	1938	48				0	54	254	109	217	0
Grp Sat Flow(s),veh/h/ln	1393	1202	1084				0	1398	1204	845	1398	0
Q Serve(g_s), s	43.8	39.5	2.7				0.0	2.3	15.2	9.4	11.3	0.0
Cycle Q Clear(g_c), s	43.8	39.5	2.7				0.0	2.3	15.2	11.7	11.3	0.0
Prop In Lane	0.07		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	814	2106	633				0	339	292	275	339	0
V/C Ratio(X)	1.01	0.92	0.08				0.00	0.16	0.87	0.40	0.64	0.00
Avail Cap(c_a), veh/h	814	2106	633				0	513	441	380	513	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	0.09	0.09	0.09				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.3	28.6	13.7				0.0	22.4	27.3	32.6	31.3	0.0
Incr Delay (d2), s/veh	12.5	0.9	0.0				0.0	0.2	11.5	0.9	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.7	13.4	0.8				0.0	0.9	5.9	2.3	4.6	0.0
LnGrp Delay(d),s/veh	42.8	29.4	13.7				0.0	22.6	38.7	33.5	33.3	0.0
LnGrp LOS	F	C	B					C	D	C	C	
Approach Vol, veh/h		2809						308			326	
Approach Delay, s/veh		33.1						35.9			33.4	
Approach LOS		C						D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		50.3		24.7				24.7				
Change Period (Y+Rc), s		6.5		6.5				6.5				
Max Green Setting (Gmax), s		34.5		27.5				27.5				
Max Q Clear Time (g_c+I1), s		45.8		17.2				13.7				
Green Ext Time (p_c), s		0.0		1.0				1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			33.4									
HCM 2010 LOS			C									





















HCM 2010 Signalized Intersection Summary
 29: 101 SBO n 2nd/Hetherton & 2nd/2nd St

Cumulative Conditions
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1260	1440	0	0	0	0	0	0	220	1060	0
Future Volume (veh/h)	0	1260	1440	0	0	0	0	0	0	220	1060	0
Number	5	2	12							7	4	14
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1485	1485							1485	1485	0
Adj Flow Rate, veh/h	0	1370	1552							239	1152	0
Adj No. of Lanes	0	3	2							1	2	0
Peak Hour Factor	0.92	0.92	0.92							0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3							3	3	0
Cap, veh/h	0	2406	1364							406	852	0
Arrive On Green	0.00	0.18	0.18							0.09	0.09	0.00
Sat Flow, veh/h	0	4456	2525							1415	2971	0
Grp Volume(v), veh/h	0	1370	1552							239	1152	0
Grp Sat Flow(s),veh/h/ln	0	1485	1263							1415	1485	0
Q Serve(g_s), s	0.0	21.1	40.5							12.1	21.5	0.0
Cycle Q Clear(g_c), s	0.0	21.1	40.5							12.1	21.5	0.0
Prop In Lane	0.00		1.00							1.00		0.00
Lane Grp Cap(c), veh/h	0	2406	1364							406	852	0
V/C Ratio(X)	0.00	0.57	1.14							0.59	1.35	0.00
Avail Cap(c_a), veh/h	0	2406	1364							406	852	0
HCM Platoon Ratio	1.00	0.33	0.33							0.33	0.33	1.00
Upstream Filter(l)	0.00	0.09	0.09							0.76	0.76	0.00
Uniform Delay (d), s/veh	0.0	22.8	30.8							29.7	34.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	63.1							1.7	164.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.7	26.1							5.0	28.3	0.0
LnGrp Delay(d),s/veh	0.0	22.9	93.9							31.4	198.6	0.0
LnGrp LOS		C	F							C	F	
Approach Vol, veh/h		2922									1391	
Approach Delay, s/veh		60.6									169.8	
Approach LOS		E									F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		49.0		26.0								
Change Period (Y+Rc), s		8.5		4.5								
Max Green Setting (Gmax), s		40.5		21.5								
Max Q Clear Time (g_c+I1), s		42.5		23.5								
Green Ext Time (p_c), s		0.0		0.0								
Intersection Summary												
HCM 2010 Ctrl Delay			95.9									
HCM 2010 LOS			F									
Notes												





















HCM 2010 Signalized Intersection Summary
30: Irwin & 2nd St

Cumulative Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						  				
Traffic Volume (veh/h)	770	880	0	0	0	0	0	1405	500	0	0	0
Future Volume (veh/h)	770	880	0	0	0	0	0	1405	500	0	0	0
Number	5	2	12				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1454	1485	0				0	1398	1398			
Adj Flow Rate, veh/h	837	957	0				0	1527	489			
Adj No. of Lanes	2	2	0				0	3	1			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0				0	3	3			
Cap, veh/h	1551	1458	0				0	1466	451			
Arrive On Green	0.16	0.16	0.00				0.00	0.38	0.38			
Sat Flow, veh/h	2769	2971	0				0	3943	1174			
Grp Volume(v), veh/h	837	957	0				0	1527	489			
Grp Sat Flow(s),veh/h/ln	1385	1485	0				0	1272	1174			
Q Serve(g_s), s	21.1	22.7	0.0				0.0	28.8	28.8			
Cycle Q Clear(g_c), s	21.1	22.7	0.0				0.0	28.8	28.8			
Prop In Lane	1.00		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	1551	1458	0				0	1466	451			
V/C Ratio(X)	0.54	0.66	0.00				0.00	1.04	1.08			
Avail Cap(c_a), veh/h	1551	1458	0				0	1466	451			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	0.36	0.36	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	24.8	25.5	0.0				0.0	23.1	23.1			
Incr Delay (d2), s/veh	0.5	0.8	0.0				0.0	35.2	67.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.2	9.5	0.0				0.0	14.8	17.7			
LnGrp Delay(d),s/veh	25.3	26.3	0.0				0.0	58.3	90.1			
LnGrp LOS	C	C						F	F			
Approach Vol, veh/h		1794						2016				
Approach Delay, s/veh		25.9						66.0				
Approach LOS		C						E				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		41.0		34.0								
Change Period (Y+Rc), s		* 4.2		* 5.2								
Max Green Setting (Gmax), s		* 37		* 29								
Max Q Clear Time (g_c+I1), s		24.7		30.8								
Green Ext Time (p_c), s		10.3		0.0								
Intersection Summary												
HCM 2010 Ctrl Delay			47.1									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary
31: Lindaro & Andersen

Cumulative Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	20	330	50	10	80	220	50	60	290	160	70	220
Future Volume (veh/h)	20	330	50	10	80	220	50	60	290	160	70	220
Number	5	2	12		1	6	16	3	8	18	7	4
Initial Q (Qb), veh	0	0	0		0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94		1.00		0.97	1.00		0.97	1.00	
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	2019	2019	2000		1942	1942	2000	1845	1845	1900	1845	1845
Adj Flow Rate, veh/h	22	359	46		87	239	44	65	315	149	76	239
Adj No. of Lanes	1	1	0		1	1	0	1	1	0	1	1
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
Percent Heavy Veh, %	3	3	3		3	3	3	3	3	3	3	3
Cap, veh/h	58	434	56		154	480	88	165	368	174	177	541
Arrive On Green	0.03	0.25	0.25		0.08	0.30	0.30	0.09	0.31	0.31	0.10	0.32
Sat Flow, veh/h	1923	1741	223		1849	1588	292	1757	1172	554	1757	1682
Grp Volume(v), veh/h	22	0	405		87	0	283	65	0	464	76	0
Grp Sat Flow(s),veh/h/ln	1923	0	1965		1849	0	1880	1757	0	1726	1757	0
Q Serve(g_s), s	0.8	0.0	13.2		3.1	0.0	8.4	2.4	0.0	17.1	2.8	0.0
Cycle Q Clear(g_c), s	0.8	0.0	13.2		3.1	0.0	8.4	2.4	0.0	17.1	2.8	0.0
Prop In Lane	1.00		0.11		1.00		0.16	1.00		0.32	1.00	
Lane Grp Cap(c), veh/h	58	0	490		154	0	569	165	0	542	177	0
V/C Ratio(X)	0.38	0.00	0.83		0.57	0.00	0.50	0.39	0.00	0.86	0.43	0.00
Avail Cap(c_a), veh/h	227	0	640		273	0	668	233	0	682	233	0
HCM Platoon Ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00		1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.3	0.0	24.1		29.9	0.0	19.4	28.9	0.0	21.8	28.7	0.0
Incr Delay (d2), s/veh	1.5	0.0	6.8		1.2	0.0	0.7	0.6	0.0	8.6	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	8.0		1.6	0.0	4.4	1.2	0.0	9.4	1.4	0.0
LnGrp Delay(d),s/veh	33.8	0.0	30.9		31.1	0.0	20.1	29.5	0.0	30.5	29.3	0.0
LnGrp LOS	C		C		C		C	C		C	C	
Approach Vol, veh/h		427				370			529			333
Approach Delay, s/veh		31.0				22.7			30.3			21.1
Approach LOS		C				C			C			C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	21.8	10.4	26.0	6.0	25.4	10.9	25.5				
Change Period (Y+Rc), s	4.0	4.9	4.0	* 4.2	4.0	4.9	4.0	* 4.2				
Max Green Setting (Gmax), s	10.0	22.1	9.0	* 27	8.0	24.1	9.0	* 27				
Max Q Clear Time (g_c+I1), s	5.1	15.2	4.4	9.6	2.8	10.4	4.8	19.1				
Green Ext Time (p_c), s	0.1	1.0	0.0	0.9	0.0	0.9	0.0	1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			27.0									
HCM 2010 LOS			C									
Notes												

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	20
Future Volume (veh/h)	20
Number	14
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	0.91
Parking Bus, Adj	1.00
Adj Sat Flow, veh/h/ln	1900
Adj Flow Rate, veh/h	18
Adj No. of Lanes	0
Peak Hour Factor	0.92
Percent Heavy Veh, %	3
Cap, veh/h	41
Arrive On Green	0.32
Sat Flow, veh/h	127
Grp Volume(v), veh/h	257
Grp Sat Flow(s),veh/h/ln	1808
Q Serve(g_s), s	7.6
Cycle Q Clear(g_c), s	7.6
Prop In Lane	0.07
Lane Grp Cap(c), veh/h	582
V/C Ratio(X)	0.44
Avail Cap(c_a), veh/h	714
HCM Platoon Ratio	1.00
Upstream Filter(l)	1.00
Uniform Delay (d), s/veh	18.2
Incr Delay (d2), s/veh	0.5
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	3.9
LnGrp Delay(d),s/veh	18.7
LnGrp LOS	B
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	

HCM Signalized Intersection Capacity Analysis
 32: Tamalpais & Mission

Cumulative Conditions
 Timing Plan: AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻		
Traffic Volume (vph)	585	75	0	740	0	0
Future Volume (vph)	585	75	0	740	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.6			3.0		
Lane Util. Factor	1.00			1.00		
Frbp, ped/bikes	0.99			1.00		
Flpb, ped/bikes	1.00			1.00		
Frt	0.98			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	1540			1573		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	1540			1573		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	636	82	0	804	0	0
RTOR Reduction (vph)	6	0	0	0	0	0
Lane Group Flow (vph)	712	0	0	804	0	0
Confl. Peds. (#/hr)		10	10		10	
Turn Type	NA			NA		
Protected Phases	2			3 4 6		
Permitted Phases						
Actuated Green, G (s)	34.4			51.8		
Effective Green, g (s)	34.4			46.2		
Actuated g/C Ratio	0.46			0.62		
Clearance Time (s)	5.6					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	706			968		
v/s Ratio Prot	c0.46			c0.51		
v/s Ratio Perm						
v/c Ratio	1.01			0.83		
Uniform Delay, d1	20.3			11.3		
Progression Factor	0.97			0.51		
Incremental Delay, d2	30.7			0.6		
Delay (s)	50.4			6.3		
Level of Service	D			A		
Approach Delay (s)	50.4			6.3	0.0	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	102.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

33: Tamalpais & 5th

Cumulative Conditions

Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↑						↕	
Traffic Volume (vph)	0	390	50	0	380	0	0	0	0	20	20	30
Future Volume (vph)	0	390	50	0	380	0	0	0	0	20	20	30
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.6			5.6						5.6	
Lane Util. Factor		1.00			1.00						1.00	
Frbp, ped/bikes		0.99			1.00						0.98	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.98			1.00						0.94	
Flt Protected		1.00			1.00						0.99	
Satd. Flow (prot)		1541			1573						1432	
Flt Permitted		1.00			1.00						0.99	
Satd. Flow (perm)		1541			1573						1432	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	424	54	0	413	0	0	0	0	22	22	33
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	29	0
Lane Group Flow (vph)	0	473	0	0	413	0	0	0	0	0	48	0
Confl. Peds. (#/hr)	10		10	10		10	10					10
Turn Type		NA			NA					Perm	NA	
Protected Phases		2			4	6					8	
Permitted Phases										8		
Actuated Green, G (s)		39.3			55.7						8.1	
Effective Green, g (s)		39.3			55.7						8.1	
Actuated g/C Ratio		0.52			0.74						0.11	
Clearance Time (s)		5.6									5.6	
Vehicle Extension (s)		3.0									1.5	
Lane Grp Cap (vph)		807			1168						154	
v/s Ratio Prot		c0.31			c0.26							
v/s Ratio Perm											0.03	
v/c Ratio		0.59			0.35						0.31	
Uniform Delay, d1		12.3			3.4						30.9	
Progression Factor		0.57			0.09						0.85	
Incremental Delay, d2		1.8			0.1						0.0	
Delay (s)		8.8			0.4						26.2	
Level of Service		A			A						C	
Approach Delay (s)		8.8			0.4			0.0			26.2	
Approach LOS		A			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			6.6									A
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			75.0							16.8		
Intersection Capacity Utilization			80.3%									D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 34: Tamalpais & Mission

Cumulative Conditions
 Timing Plan: AM Peak Hour















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Traffic Volume (vph)	585	0	0	730	10	20
Future Volume (vph)	585	0	0	730	10	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.6			5.6	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.91	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	1573			1573	1408	
Flt Permitted	1.00			1.00	0.98	
Satd. Flow (perm)	1573			1573	1408	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	636	0	0	793	11	22
RTOR Reduction (vph)	0	0	0	0	19	0
Lane Group Flow (vph)	636	0	0	793	14	0
Confl. Peds. (#/hr)		10				
Turn Type	NA			NA	Prot	
Protected Phases	2 8			6	3 4	
Permitted Phases						
Actuated Green, G (s)	52.4			34.4	11.8	
Effective Green, g (s)	47.2			34.4	11.8	
Actuated g/C Ratio	0.63			0.46	0.16	
Clearance Time (s)				5.6		
Vehicle Extension (s)				3.0		
Lane Grp Cap (vph)	989			721	221	
v/s Ratio Prot	c0.40			c0.50	c0.01	
v/s Ratio Perm						
v/c Ratio	0.64			1.10	0.07	
Uniform Delay, d1	8.7			20.3	26.9	
Progression Factor	0.44			1.16	1.06	
Incremental Delay, d2	0.1			57.1	0.0	
Delay (s)	4.0			80.6	28.5	
Level of Service	A			F	C	
Approach Delay (s)	4.0			80.6	28.5	
Approach LOS	A			F	C	

Intersection Summary			
HCM 2000 Control Delay	46.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	102.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

35: Tamalpais & 5th

Cumulative Conditions
Timing Plan: AM Peak Hour
















													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑			↑			↕					
Traffic Volume (vph)	0	410	0	0	350	20	30	10	30	0	0	0	
Future Volume (vph)	0	410	0	0	350	20	30	10	30	0	0	0	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Total Lost time (s)		5.6			5.6			5.6					
Lane Util. Factor		1.00			1.00			1.00					
Frbp, ped/bikes		1.00			1.00			0.98					
Flpb, ped/bikes		1.00			1.00			1.00					
Frt		1.00			0.99			0.94					
Flt Protected		1.00			1.00			0.98					
Satd. Flow (prot)		1573			1557			1422					
Flt Permitted		1.00			1.00			0.98					
Satd. Flow (perm)		1573			1557			1422					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	446	0	0	380	22	33	11	33	0	0	0	
RTOR Reduction (vph)	0	0	0	0	2	0	0	28	0	0	0	0	
Lane Group Flow (vph)	0	446	0	0	400	0	0	49	0	0	0	0	
Confl. Peds. (#/hr)	10					10			10				
Turn Type		NA			NA		Split	NA					
Protected Phases		2 8			6		4	4					
Permitted Phases													
Actuated Green, G (s)		53.0			39.3			10.8					
Effective Green, g (s)		53.0			39.3			10.8					
Actuated g/C Ratio		0.71			0.52			0.14					
Clearance Time (s)					5.6			5.6					
Vehicle Extension (s)					3.0			1.5					
Lane Grp Cap (vph)		1111			815			204					
v/s Ratio Prot		c0.28			c0.26			c0.03					
v/s Ratio Perm													
v/c Ratio		0.40			0.49			0.24					
Uniform Delay, d1		4.5			11.4			28.5					
Progression Factor		0.02			0.68			1.26					
Incremental Delay, d2		0.1			2.0			0.1					
Delay (s)		0.1			9.7			36.1					
Level of Service		A			A			D					
Approach Delay (s)		0.1			9.7			36.1			0.0		
Approach LOS		A			A			D			A		
Intersection Summary													
HCM 2000 Control Delay			7.3									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.45										
Actuated Cycle Length (s)			75.0									Sum of lost time (s)	16.8
Intersection Capacity Utilization			80.3%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

36: Tamalpais & 4th




















Cumulative Conditions

Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	500	0	0	420	70	10	10	10	0	0	0
Future Volume (vph)	0	500	0	0	420	70	10	10	10	0	0	0
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.6			5.6			5.6				
Lane Util. Factor		1.00			1.00			1.00				
Frbp, ped/bikes		1.00			0.98			0.99				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.98			0.95				
Flt Protected		1.00			1.00			0.98				
Satd. Flow (prot)		1573			1517			1464				
Flt Permitted		1.00			1.00			0.98				
Satd. Flow (perm)		1573			1517			1464				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	543	0	0	457	76	11	11	11	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	9	0	0	0	0
Lane Group Flow (vph)	0	543	0	0	525	0	0	24	0	0	0	0
Confl. Peds. (#/hr)	39		22			39			10			
Turn Type		NA			NA		Split	NA				
Protected Phases		2 8			6		4	4				
Permitted Phases												
Actuated Green, G (s)		50.3			30.9			13.9				
Effective Green, g (s)		50.3			30.9			13.9				
Actuated g/C Ratio		0.67			0.41			0.19				
Clearance Time (s)					5.6			5.6				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)		1054			625			271				
v/s Ratio Prot		c0.35			c0.35			c0.02				
v/s Ratio Perm												
v/c Ratio		0.52			0.84			0.09				
Uniform Delay, d1		6.2			19.8			25.3				
Progression Factor		0.07			0.98			1.02				
Incremental Delay, d2		0.4			11.5			0.1				
Delay (s)		0.8			31.0			25.9				
Level of Service		A			C			C				
Approach Delay (s)		0.8			31.0			25.9			0.0	
Approach LOS		A			C			C			A	
Intersection Summary												
HCM 2000 Control Delay			16.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			75.0				Sum of lost time (s)			16.4		
Intersection Capacity Utilization			97.1%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
1: Lincoln & Mission

Cumulative Conditions
Timing Plan: PM Peak Hour

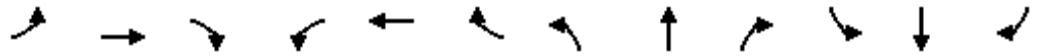
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	495	20	70	550	70	40	520	60	0	400	320
Future Volume (veh/h)	280	495	20	70	550	70	40	520	60	0	400	320
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	0.99		0.93	1.00		0.95
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1676	1676	1710	1676	1676	1710	1800	1694	1728	0	1765	1728
Adj Flow Rate, veh/h	292	516	19	73	573	67	42	542	52	0	417	144
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	0	2	2
Cap, veh/h	279	943	35	397	551	64	97	1034	97	0	937	319
Arrive On Green	0.17	0.59	0.59	0.75	0.75	0.75	0.77	0.77	0.77	0.00	0.39	0.39
Sat Flow, veh/h	1597	1606	59	819	1469	172	120	2668	250	0	2506	823
Grp Volume(v), veh/h	292	0	535	73	0	640	329	0	307	0	287	274
Grp Sat Flow(s),veh/h/ln	1597	0	1665	819	0	1641	1562	0	1477	0	1676	1565
Q Serve(g_s), s	14.0	0.0	15.6	2.2	0.0	30.0	0.0	0.0	6.4	0.0	10.1	10.4
Cycle Q Clear(g_c), s	14.0	0.0	15.6	2.2	0.0	30.0	5.7	0.0	6.4	0.0	10.1	10.4
Prop In Lane	1.00		0.04	1.00		0.10	0.13		0.17	0.00		0.53
Lane Grp Cap(c), veh/h	279	0	978	397	0	615	656	0	572	0	650	606
V/C Ratio(X)	1.05	0.00	0.55	0.18	0.00	1.04	0.50	0.00	0.54	0.00	0.44	0.45
Avail Cap(c_a), veh/h	279	0	978	397	0	615	656	0	572	0	650	606
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.76	0.00	0.76	0.74	0.00	0.74	0.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	0.0	10.0	6.5	0.0	10.0	6.2	0.0	6.2	0.0	18.1	18.2
Incr Delay (d2), s/veh	66.1	0.0	2.2	0.8	0.0	42.5	2.0	0.0	2.6	0.0	2.2	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.3	0.0	7.7	0.6	0.0	19.9	2.9	0.0	2.8	0.0	5.1	4.9
LnGrp Delay(d),s/veh	99.1	0.0	12.2	7.3	0.0	52.5	8.2	0.0	8.9	0.0	20.3	20.6
LnGrp LOS	F		B	A		F	A		A		C	C
Approach Vol, veh/h		827			713			636			561	
Approach Delay, s/veh		42.9			47.9			8.5			20.4	
Approach LOS		D			D			A			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		51.2		35.8	17.0	34.2		35.8				
Change Period (Y+Rc), s		* 4.2		4.6	3.0	* 4.2		4.6				
Max Green Setting (Gmax), s		* 47		24.4	14.0	* 30		24.4				
Max Q Clear Time (g_c+I1), s		17.6		8.4	16.0	32.0		12.4				
Green Ext Time (p_c), s		5.8		5.2	0.0	0.0		3.8				
Intersection Summary												
HCM 2010 Ctrl Delay			31.6									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis

2: Hetherton & Mission

Cumulative Conditions

Timing Plan: PM Peak Hour



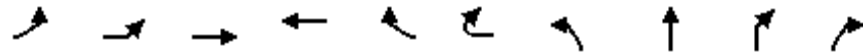
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↑↑			↑						↑↑	↑		
Traffic Volume (vph)	0	490	50	40	180	0	0	0	0	250	1220	495		
Future Volume (vph)	0	490	50	40	180	0	0	0	0	250	1220	495		
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800		
Lane Width	12	10	12	12	16	12	12	12	12	12	12	12		
Total Lost time (s)		4.2			4.2						4.6	4.6		
Lane Util. Factor		0.95			1.00						0.95	1.00		
Frbp, ped/bikes		1.00			1.00						1.00	0.98		
Flpb, ped/bikes		1.00			1.00						1.00	1.00		
Frt		0.99			1.00						1.00	0.85		
Flt Protected		1.00			0.99						0.99	1.00		
Satd. Flow (prot)		2769			1781						2992	1321		
Flt Permitted		1.00			0.82						0.99	1.00		
Satd. Flow (perm)		2769			1474						2992	1321		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96		
Adj. Flow (vph)	0	510	52	42	188	0	0	0	0	260	1271	516		
RTOR Reduction (vph)	0	10	0	0	0	0	0	0	0	0	0	0		
Lane Group Flow (vph)	0	552	0	0	230	0	0	0	0	0	1531	516		
Confl. Peds. (#/hr)			15	15		4			11					
Confl. Bikes (#/hr)			3			3			3			2		
Turn Type		NA		Perm	NA					Split	NA	custom		
Protected Phases		4			8					2	2			
Permitted Phases				8								5		
Actuated Green, G (s)		23.8			23.8						47.4	40.4		
Effective Green, g (s)		23.8			23.8						47.4	40.4		
Actuated g/C Ratio		0.30			0.30						0.59	0.50		
Clearance Time (s)		4.2			4.2						4.6	4.6		
Vehicle Extension (s)		3.0			3.0						3.0	3.0		
Lane Grp Cap (vph)		823			438						1772	667		
v/s Ratio Prot		c0.20									c0.51			
v/s Ratio Perm					0.16							0.39		
v/c Ratio		0.67			0.53						0.86	0.77		
Uniform Delay, d1		24.7			23.4						13.6	16.1		
Progression Factor		0.46			0.42						1.00	1.00		
Incremental Delay, d2		3.8			3.8						5.9	8.5		
Delay (s)		15.2			13.6						19.5	24.6		
Level of Service		B			B						B	C		
Approach Delay (s)		15.2			13.6			0.0			20.8			
Approach LOS		B			B			A			C			
Intersection Summary														
HCM 2000 Control Delay			19.1									HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.82											
Actuated Cycle Length (s)			80.0								10.8			
Intersection Capacity Utilization			98.4%										ICU Level of Service	F
Analysis Period (min)			15											
c Critical Lane Group														

HCM Signalized Intersection Capacity Analysis

3: Irwin & Mission

Cumulative Conditions





















Timing Plan: PM Peak Hour



Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations		↔	↑	↑	↔			↕	↔	
Traffic Volume (vph)	400	20	320	145	320	20	70	1570	200	60
Future Volume (vph)	400	20	320	145	320	20	70	1570	200	60
Ideal Flow (vphpl)	2200	1800	2200	2200	2200	1800	2200	2200	1800	2200
Lane Width	9	12	10	10	9	12	12	12	12	12
Total Lost time (s)		4.2	4.2	4.2	4.2			4.2	4.2	
Lane Util. Factor		1.00	1.00	1.00	1.00			0.95	1.00	
Frbp, ped/bikes		1.00	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	
Frt		1.00	1.00	1.00	0.85			1.00	0.85	
Flt Protected		0.95	1.00	1.00	1.00			1.00	1.00	
Satd. Flow (prot)		1509	1812	1812	1485			3678	1316	
Flt Permitted		0.62	1.00	1.00	1.00			1.00	1.00	
Satd. Flow (perm)		986	1812	1812	1485			3678	1316	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	417	21	333	151	333	21	73	1635	208	62
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	39	0
Lane Group Flow (vph)	0	438	333	151	354	0	0	1708	232	0
Confl. Peds. (#/hr)							8			3
Confl. Bikes (#/hr)					4	4				
Turn Type	pm+pt	pm+pt	NA	NA	Prot		Perm	NA	Perm	
Protected Phases	5	5	2	6	6			4		
Permitted Phases	2	2					4			4
Actuated Green, G (s)		33.8	33.8	18.8	18.8			37.8	37.8	
Effective Green, g (s)		33.8	33.8	18.8	18.8			37.8	37.8	
Actuated g/C Ratio		0.42	0.42	0.24	0.24			0.47	0.47	
Clearance Time (s)		4.2	4.2	4.2	4.2			4.2	4.2	
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0	
Lane Grp Cap (vph)		487	765	425	348			1737	621	
v/s Ratio Prot		c0.12	0.18	0.08	c0.24					
v/s Ratio Perm		0.26						0.46	0.18	
v/c Ratio		0.90	0.44	0.36	1.02			0.98	0.37	
Uniform Delay, d1		21.5	16.3	25.5	30.6			20.8	13.5	
Progression Factor		0.68	0.77	1.00	1.00			0.54	0.27	
Incremental Delay, d2		13.7	0.3	0.5	52.7			12.4	0.9	
Delay (s)		28.4	12.9	26.1	83.3			23.5	4.6	
Level of Service		C	B	C	F			C	A	
Approach Delay (s)			21.7	66.2				20.9		
Approach LOS			C	E				C		
Intersection Summary										
HCM 2000 Control Delay			28.1					HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			1.00							
Actuated Cycle Length (s)			80.0					Sum of lost time (s)		12.6
Intersection Capacity Utilization			101.6%					ICU Level of Service		G
Analysis Period (min)			15							
c	Critical Lane Group									

HCM 2010 Signalized Intersection Summary
4: Lincoln & 5th


















Cumulative Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	400	40	30	245	65	60	465	90	90	360	40
Future Volume (veh/h)	90	400	40	30	245	65	60	465	90	90	360	40
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	1.00		0.97	0.98		0.93	0.98		0.93
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1412	1560	1530	1412	1500	1530	1440	1500	1469	1440	1500	1469
Adj Flow Rate, veh/h	94	417	38	31	255	56	62	484	76	94	375	33
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	448	641	58	259	541	119	135	902	139	213	783	71
Arrive On Green	0.46	0.46	0.46	0.91	0.91	0.91	0.86	0.86	0.86	0.86	0.86	0.86
Sat Flow, veh/h	846	1405	128	745	1186	260	189	2105	324	351	1826	165
Grp Volume(v), veh/h	94	0	455	31	0	311	322	0	300	238	0	264
Grp Sat Flow(s),veh/h/ln	846	0	1533	745	0	1446	1339	0	1279	1020	0	1321
Q Serve(g_s), s	5.8	0.0	18.4	2.0	0.0	2.6	0.0	0.0	5.0	1.7	0.0	3.8
Cycle Q Clear(g_c), s	8.4	0.0	18.4	20.3	0.0	2.6	4.3	0.0	5.0	6.7	0.0	3.8
Prop In Lane	1.00		0.08	1.00		0.18	0.19		0.25	0.40		0.12
Lane Grp Cap(c), veh/h	448	0	700	259	0	660	628	0	548	500	0	567
V/C Ratio(X)	0.21	0.00	0.65	0.12	0.00	0.47	0.51	0.00	0.55	0.48	0.00	0.47
Avail Cap(c_a), veh/h	448	0	700	259	0	660	628	0	548	500	0	567
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.97	0.00	0.97	0.83	0.00	0.83	0.68	0.00	0.68
Uniform Delay (d), s/veh	15.0	0.0	16.8	8.3	0.0	2.0	3.6	0.0	3.6	3.5	0.0	3.5
Incr Delay (d2), s/veh	1.1	0.0	4.6	0.9	0.0	2.3	2.5	0.0	3.2	2.2	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	8.6	0.5	0.0	1.3	2.0	0.0	2.0	1.2	0.0	1.5
LnGrp Delay(d),s/veh	16.0	0.0	21.5	9.2	0.0	4.3	6.0	0.0	6.9	5.7	0.0	5.4
LnGrp LOS	B		C	A		A	A		A	A		A
Approach Vol, veh/h		549			342			622			502	
Approach Delay, s/veh		20.5			4.8			6.4			5.6	
Approach LOS		C			A			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		41.1		38.9		41.1		38.9				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		36.5		34.3		36.5		34.3				
Max Q Clear Time (g_c+I1), s		20.4		7.0		22.3		8.7				
Green Ext Time (p_c), s		2.5		3.0		1.3		2.5				
Intersection Summary												
HCM 2010 Ctrl Delay			9.8									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary




















6: Irwin & 5th

Cumulative Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	160	0	0	140	120	100	1495	20	0	0	0
Future Volume (veh/h)	270	160	0	0	140	120	100	1495	20	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.96			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1588	1588	0	0	1588	1620	1620	1588	1620			
Adj Flow Rate, veh/h	281	167	0	0	146	120	104	1557	19			
Adj No. of Lanes	1	1	0	0	1	0	0	3	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	2	0	2	0			
Cap, veh/h	381	703	0	0	306	251	118	1892	24			
Arrive On Green	0.74	0.74	0.00	0.00	0.44	0.44	0.15	0.15	0.15			
Sat Flow, veh/h	994	1588	0	0	691	568	268	4275	54			
Grp Volume(v), veh/h	281	167	0	0	0	266	612	511	557			
Grp Sat Flow(s),veh/h/ln	994	1588	0	0	0	1259	1575	1445	1576			
Q Serve(g_s), s	21.9	2.7	0.0	0.0	0.0	11.9	30.4	27.3	27.3			
Cycle Q Clear(g_c), s	33.8	2.7	0.0	0.0	0.0	11.9	30.4	27.3	27.3			
Prop In Lane	1.00		0.00	0.00		0.45	0.17		0.03			
Lane Grp Cap(c), veh/h	381	703	0	0	0	557	697	640	698			
V/C Ratio(X)	0.74	0.24	0.00	0.00	0.00	0.48	0.88	0.80	0.80			
Avail Cap(c_a), veh/h	381	703	0	0	0	557	697	640	698			
HCM Platoon Ratio	1.67	1.67	1.00	1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)	0.69	0.69	0.00	0.00	0.00	1.00	0.51	0.51	0.51			
Uniform Delay (d), s/veh	16.0	6.2	0.0	0.0	0.0	15.8	32.0	30.7	30.7			
Incr Delay (d2), s/veh	5.1	0.1	0.0	0.0	0.0	0.6	8.2	5.3	4.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.4	1.2	0.0	0.0	0.0	4.2	14.8	11.9	12.9			
LnGrp Delay(d),s/veh	21.1	6.3	0.0	0.0	0.0	16.4	40.2	36.0	35.6			
LnGrp LOS	C	A				B	D	D	D			
Approach Vol, veh/h		448			266			1680				
Approach Delay, s/veh		15.6			16.4			37.4				
Approach LOS		B			B			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		40.0		40.0		40.0						
Change Period (Y+Rc), s		4.6		4.6		4.6						
Max Green Setting (Gmax), s		35.4		35.4		35.4						
Max Q Clear Time (g_c+I1), s		35.8		32.4		13.9						
Green Ext Time (p_c), s		0.0		2.1		1.1						
Intersection Summary												
HCM 2010 Ctrl Delay				31.0								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary
7: Lincoln & 4th

Cumulative Conditions
Timing Plan: PM Peak Hour

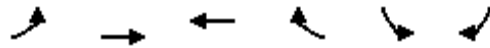
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	245	40	115	280	155	30	425	90	50	310	70
Future Volume (veh/h)	50	245	40	115	280	155	30	425	90	50	310	70
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	0.97		0.90	0.93		0.83	0.97		0.83
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1588	1525	1620	1588	1588	1620	1620	1588	1555	1620	1588	1555
Adj Flow Rate, veh/h	52	255	34	120	292	135	31	443	73	52	323	52
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	284	647	86	446	493	228	83	931	148	123	721	125
Arrive On Green	0.50	0.50	0.50	0.16	0.16	0.16	0.13	0.13	0.13	0.80	0.80	0.80
Sat Flow, veh/h	861	1300	173	949	991	458	85	2343	373	169	1814	316
Grp Volume(v), veh/h	52	0	289	120	0	427	295	0	252	210	0	217
Grp Sat Flow(s),veh/h/ln	861	0	1473	949	0	1450	1512	0	1289	982	0	1316
Q Serve(g_s), s	4.0	0.0	9.8	9.3	0.0	21.8	0.0	0.0	14.5	4.3	0.0	4.0
Cycle Q Clear(g_c), s	25.8	0.0	9.8	19.1	0.0	21.8	13.7	0.0	14.5	18.8	0.0	4.0
Prop In Lane	1.00		0.12	1.00		0.32	0.11		0.29	0.25		0.24
Lane Grp Cap(c), veh/h	284	0	733	446	0	721	651	0	513	447	0	523
V/C Ratio(X)	0.18	0.00	0.39	0.27	0.00	0.59	0.45	0.00	0.49	0.47	0.00	0.41
Avail Cap(c_a), veh/h	284	0	733	446	0	721	651	0	513	447	0	523
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.93	0.00	0.93	0.81	0.00	0.81	0.78	0.00	0.78
Uniform Delay (d), s/veh	25.6	0.0	12.6	29.3	0.0	25.9	26.9	0.0	27.3	6.6	0.0	5.4
Incr Delay (d2), s/veh	1.4	0.0	1.6	1.4	0.0	3.3	1.8	0.0	2.7	2.8	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	4.3	2.6	0.0	9.4	6.4	0.0	5.6	1.6	0.0	1.6
LnGrp Delay(d),s/veh	27.0	0.0	14.2	30.6	0.0	29.2	28.7	0.0	30.0	9.4	0.0	7.2
LnGrp LOS	C		B	C		C	C		C	A		A
Approach Vol, veh/h		341			547			547			427	
Approach Delay, s/veh		16.1			29.5			29.3			8.3	
Approach LOS		B			C			C			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		44.0		36.0		44.0		36.0				
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2		* 4.2				
Max Green Setting (Gmax), s		* 40		* 32		* 40		* 32				
Max Q Clear Time (g_c+I1), s		27.8		16.5		23.8		20.8				
Green Ext Time (p_c), s		2.3		4.3		4.8		2.8				
Intersection Summary												
HCM 2010 Ctrl Delay				22.1								
HCM 2010 LOS				C								
Notes												

HCM Signalized Intersection Capacity Analysis

8: 4th & Tamalpais

Cumulative Conditions

Timing Plan: PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↗
Traffic Volume (vph)	0	465	440	0	0	120
Future Volume (vph)	0	465	440	0	0	120
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0	6.0			5.6
Lane Util. Factor		1.00	1.00			1.00
Frbp, ped/bikes		1.00	1.00			0.78
Flpb, ped/bikes		1.00	1.00			1.00
Frt		1.00	1.00			0.86
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		1588	1588			1074
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		1588	1588			1074
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	484	458	0	0	125
RTOR Reduction (vph)	0	0	0	0	0	104
Lane Group Flow (vph)	0	484	458	0	0	21
Confl. Peds. (#/hr)				59		78
Confl. Bikes (#/hr)				14		
Turn Type		NA	NA			Perm
Protected Phases		2 8	4 6			
Permitted Phases						8
Actuated Green, G (s)		54.9	55.1			13.3
Effective Green, g (s)		54.9	55.1			13.3
Actuated g/C Ratio		0.69	0.69			0.17
Clearance Time (s)						5.6
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)		1089	1093			178
v/s Ratio Prot		c0.30	c0.29			
v/s Ratio Perm						0.02
v/c Ratio		0.44	0.42			0.12
Uniform Delay, d1		5.7	5.4			28.4
Progression Factor		0.95	0.15			1.00
Incremental Delay, d2		0.3	0.2			0.3
Delay (s)		5.6	1.0			28.6
Level of Service		A	A			C
Approach Delay (s)		5.6	1.0		28.6	
Approach LOS		A	A		C	
Intersection Summary						
HCM 2000 Control Delay			6.4		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.50			
Actuated Cycle Length (s)			80.0		Sum of lost time (s)	17.6
Intersection Capacity Utilization			95.9%		ICU Level of Service	F
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

9: Hetherton & 4th

Cumulative Conditions

Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↖	↑						↑↑↑	↗
Traffic Volume (vph)	0	285	190	80	260	0	0	0	0	135	1040	205
Future Volume (vph)	0	285	190	80	260	0	0	0	0	135	1040	205
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	13	10	15	11	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Lane Util. Factor		1.00	1.00	1.00	1.00						0.91	1.00
Frbp, ped/bikes		1.00	0.93	1.00	1.00						1.00	0.92
Flpb, ped/bikes		1.00	1.00	0.97	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						0.99	1.00
Satd. Flow (prot)		1641	1172	1609	1535						4142	1102
Flt Permitted		1.00	1.00	0.47	1.00						0.99	1.00
Satd. Flow (perm)		1641	1172	792	1535						4142	1102
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	297	198	83	271	0	0	0	0	141	1083	214
RTOR Reduction (vph)	0	0	38	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	297	160	83	271	0	0	0	0	0	1224	214
Confl. Peds. (#/hr)			51	51		28			11	11		19
Confl. Bikes (#/hr)			10			16			1			1
Parking (#/hr)											2	2
Turn Type		NA	Perm	Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases			4	8						2		5
Actuated Green, G (s)		29.8	29.8	29.8	29.8						41.4	34.4
Effective Green, g (s)		29.8	29.8	29.8	29.8						41.4	34.4
Actuated g/C Ratio		0.37	0.37	0.37	0.37						0.52	0.43
Clearance Time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		611	436	295	571						2143	473
v/s Ratio Prot		c0.18			0.18							
v/s Ratio Perm			0.14	0.10							0.30	0.19
v/c Ratio		0.49	0.37	0.28	0.47						0.57	0.45
Uniform Delay, d1		19.2	18.3	17.6	19.1						13.2	16.1
Progression Factor		0.56	0.39	0.94	0.95						0.36	0.50
Incremental Delay, d2		2.5	2.2	2.2	2.6						0.8	2.1
Delay (s)		13.2	9.4	18.7	20.9						5.5	10.2
Level of Service		B	A	B	C						A	B
Approach Delay (s)		11.7			20.4			0.0			6.2	
Approach LOS		B			C			A			A	



















Intersection Summary

HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group















HCM 2010 Signalized Intersection Summary
10: Irwin & 4th

Cumulative Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	230	0	0	210	90	120	1350	170	0	0	0
Future Volume (veh/h)	180	230	0	0	210	90	120	1350	170	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.95	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1588	1588	0	0	1588	1620	1525	1588	1620			
Adj Flow Rate, veh/h	188	240	0	0	219	82	125	1406	156			
Adj No. of Lanes	1	1	0	0	1	0	1	3	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	276	651	0	0	387	145	704	1919	213			
Arrive On Green	0.14	0.14	0.00	0.00	0.14	0.14	0.16	0.16	0.16			
Sat Flow, veh/h	964	1588	0	0	944	354	1452	3956	439			
Grp Volume(v), veh/h	188	240	0	0	0	301	125	1027	535			
Grp Sat Flow(s),veh/h/ln	964	1588	0	0	0	1298	1452	1445	1504			
Q Serve(g_s), s	15.4	11.0	0.0	0.0	0.0	17.4	6.0	27.1	27.1			
Cycle Q Clear(g_c), s	32.8	11.0	0.0	0.0	0.0	17.4	6.0	27.1	27.1			
Prop In Lane	1.00		0.00	0.00		0.27	1.00		0.29			
Lane Grp Cap(c), veh/h	276	651	0	0	0	532	704	1402	730			
V/C Ratio(X)	0.68	0.37	0.00	0.00	0.00	0.57	0.18	0.73	0.73			
Avail Cap(c_a), veh/h	276	651	0	0	0	532	704	1402	730			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	0.33	0.33	0.33	0.33	0.33			
Upstream Filter(I)	0.87	0.87	0.00	0.00	0.00	1.00	0.41	0.41	0.41			
Uniform Delay (d), s/veh	43.4	25.2	0.0	0.0	0.0	27.9	19.8	28.7	28.7			
Incr Delay (d2), s/veh	11.2	1.4	0.0	0.0	0.0	4.3	0.2	1.4	2.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.0	5.1	0.0	0.0	0.0	6.9	2.4	11.1	11.8			
LnGrp Delay(d),s/veh	54.6	26.6	0.0	0.0	0.0	32.2	20.0	30.1	31.4			
LnGrp LOS	D	C				C	C	C	C			
Approach Vol, veh/h		428			301			1687				
Approach Delay, s/veh		38.9			32.2			29.7				
Approach LOS		D			C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		37.0		43.0		37.0						
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2						
Max Green Setting (Gmax), s		* 33		* 39		* 33						
Max Q Clear Time (g_c+I1), s		34.8		29.1		19.4						
Green Ext Time (p_c), s		0.0		5.8		1.1						
Intersection Summary												
HCM 2010 Ctrl Delay				31.7								
HCM 2010 LOS				C								
Notes												













HCM 2010 Signalized Intersection Summary
 11: D & 3rd

Cumulative Conditions
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	335	1580	0	0	0	0	0	300	60
Future Volume (veh/h)	0	0	0	335	1580	0	0	0	0	0	300	60
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.94
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.82
Adj Sat Flow, veh/h/ln				1530	1500	0				0	1500	1530
Adj Flow Rate, veh/h				349	1646	0				0	312	42
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				512	2181	0				0	464	61
Arrive On Green				0.23	0.23	0.00				0.00	0.20	0.20
Sat Flow, veh/h				648	3297	0				0	2359	303
Grp Volume(v), veh/h				721	1274	0				0	193	161
Grp Sat Flow(s),veh/h/ln				1338	1242	0				0	1425	1162
Q Serve(g_s), s				40.5	38.2	0.0				0.0	10.0	10.3
Cycle Q Clear(g_c), s				40.5	38.2	0.0				0.0	10.0	10.3
Prop In Lane				0.48		0.00				0.00		0.26
Lane Grp Cap(c), veh/h				986	1707	0				0	289	236
V/C Ratio(X)				0.73	0.75	0.00				0.00	0.67	0.68
Avail Cap(c_a), veh/h				986	1707	0				0	417	340
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				0.46	0.46	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				25.4	24.5	0.0				0.0	29.4	29.5
Incr Delay (d2), s/veh				2.2	1.4	0.0				0.0	2.6	3.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				15.7	13.5	0.0				0.0	4.1	3.5
LnGrp Delay(d),s/veh				27.6	25.9	0.0				0.0	32.0	33.0
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1995						354	
Approach Delay, s/veh					26.5						32.4	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		59.2		20.8								
Change Period (Y+Rc), s		* 4.2		4.6								
Max Green Setting (Gmax), s		* 48		23.4								
Max Q Clear Time (g_c+I1), s		42.5		12.3								
Green Ext Time (p_c), s		4.1		1.1								
Intersection Summary												
HCM 2010 Ctrl Delay				27.4								
HCM 2010 LOS				C								
Notes												













HCM 2010 Signalized Intersection Summary
12: C & 3rd

Cumulative Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑		↑↑				
Traffic Volume (veh/h)	0	0	0	0	1775	160	150	330	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1775	160	150	330	0	0	0	0
Number				5	2	12	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.98	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1412	1412	1440	1412	0			
Adj Flow Rate, veh/h				0	1849	133	156	344	0			
Adj No. of Lanes				0	3	1	0	2	0			
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %				0	2	2	2	2	0			
Cap, veh/h				0	2481	757	247	442	0			
Arrive On Green				0.00	0.21	0.21	0.08	0.08	0.00			
Sat Flow, veh/h				0	3981	1175	700	1822	0			
Grp Volume(v), veh/h				0	1849	133	270	230	0			
Grp Sat Flow(s),veh/h/ln				0	1285	1175	1237	1220	0			
Q Serve(g_s), s				0.0	35.9	7.4	16.9	14.7	0.0			
Cycle Q Clear(g_c), s				0.0	35.9	7.4	17.3	14.7	0.0			
Prop In Lane				0.00		1.00	0.58		0.00			
Lane Grp Cap(c), veh/h				0	2481	757	382	307	0			
V/C Ratio(X)				0.00	0.75	0.18	0.71	0.75	0.00			
Avail Cap(c_a), veh/h				0	2481	757	408	333	0			
HCM Platoon Ratio				1.00	0.33	0.33	0.33	0.33	1.00			
Upstream Filter(I)				0.00	0.28	0.28	0.74	0.74	0.00			
Uniform Delay (d), s/veh				0.0	25.4	14.1	35.4	34.2	0.0			
Incr Delay (d2), s/veh				0.0	0.6	0.1	3.9	6.3	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	13.0	2.4	6.3	5.5	0.0			
LnGrp Delay(d),s/veh				0.0	26.0	14.3	39.3	40.6	0.0			
LnGrp LOS					C	B	D	D				
Approach Vol, veh/h					1982			500				
Approach Delay, s/veh					25.2			39.9				
Approach LOS					C			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		55.7		24.3								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 50		* 22								
Max Q Clear Time (g_c+I1), s		37.9		19.3								
Green Ext Time (p_c), s		8.1		0.6								
Intersection Summary												
HCM 2010 Ctrl Delay				28.1								
HCM 2010 LOS				C								
Notes												

















HCM 2010 Signalized Intersection Summary
13: B & 3rd

Cumulative Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑						↑↑	
Traffic Volume (veh/h)	0	0	0	195	1840	0	0	0	0	0	290	100
Future Volume (veh/h)	0	0	0	195	1840	0	0	0	0	0	290	100
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.85
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1440	1412	0				0	1412	1440
Adj Flow Rate, veh/h				203	1917	0				0	302	94
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				273	2175	0				0	446	133
Arrive On Green				0.22	0.22	0.00				0.00	0.24	0.24
Sat Flow, veh/h				332	3451	0				0	1909	548
Grp Volume(v), veh/h				782	1338	0				0	217	179
Grp Sat Flow(s),veh/h/ln				1329	1169	0				0	1341	1045
Q Serve(g_s), s				44.0	44.3	0.0				0.0	11.7	12.6
Cycle Q Clear(g_c), s				45.9	44.3	0.0				0.0	11.7	12.6
Prop In Lane				0.26		0.00				0.00		0.52
Lane Grp Cap(c), veh/h				923	1525	0				0	326	254
V/C Ratio(X)				0.85	0.88	0.00				0.00	0.67	0.71
Avail Cap(c_a), veh/h				923	1525	0				0	389	303
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				0.47	0.47	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				28.9	28.3	0.0				0.0	27.4	27.7
Incr Delay (d2), s/veh				4.7	3.7	0.0				0.0	3.3	5.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				18.1	15.2	0.0				0.0	4.6	4.0
LnGrp Delay(d),s/veh				33.6	32.0	0.0				0.0	30.6	33.6
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					2120						396	
Approach Delay, s/veh					32.6						32.0	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		56.4		23.6								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 48		* 23								
Max Q Clear Time (g_c+I1), s		47.9		14.6								
Green Ext Time (p_c), s		0.5		1.1								
Intersection Summary												
HCM 2010 Ctrl Delay				32.5								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary
14: A & 3rd

Cumulative Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	80	1685	100	260	175	0	0	180	50
Future Volume (veh/h)	0	0	0	80	1685	100	260	175	0	0	180	50
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.91	0.96		1.00	1.00		0.91
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1800	1765	1800	1853	1853	0	0	1853	1890
Adj Flow Rate, veh/h				83	1755	96	271	182	0	0	188	38
Adj No. of Lanes				0	3	0	1	1	0	0	1	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				109	2451	138	315	666	0	0	275	56
Arrive On Green				0.18	0.18	0.18	0.03	0.12	0.00	0.00	0.21	0.21
Sat Flow, veh/h				204	4587	259	1765	1853	0	0	1308	264
Grp Volume(v), veh/h				713	594	627	271	182	0	0	0	226
Grp Sat Flow(s),veh/h/ln				1754	1606	1690	1765	1853	0	0	0	1572
Q Serve(g_s), s				30.9	27.7	27.9	5.3	7.2	0.0	0.0	0.0	10.6
Cycle Q Clear(g_c), s				30.9	27.7	27.9	5.3	7.2	0.0	0.0	0.0	10.6
Prop In Lane				0.12		0.15	1.00		0.00	0.00		0.17
Lane Grp Cap(c), veh/h				937	858	903	315	666	0	0	0	330
V/C Ratio(X)				0.76	0.69	0.70	0.86	0.27	0.00	0.00	0.00	0.68
Avail Cap(c_a), veh/h				937	858	903	327	718	0	0	0	364
HCM Platoon Ratio				0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	0.73	0.73	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				28.1	26.8	26.8	35.8	25.7	0.0	0.0	0.0	29.2
Incr Delay (d2), s/veh				5.8	4.6	4.4	16.4	0.3	0.0	0.0	0.0	6.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				16.6	13.4	14.2	7.4	3.7	0.0	0.0	0.0	5.2
LnGrp Delay(d),s/veh				33.9	31.3	31.2	52.2	26.1	0.0	0.0	0.0	35.9
LnGrp LOS				C	C	C	D	C				D
Approach Vol, veh/h					1934			453			226	
Approach Delay, s/veh					32.2			41.7			35.9	
Approach LOS					C			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			11.5	21.3		47.2		32.8				
Change Period (Y+Rc), s			4.0	4.5		4.5		4.0				
Max Green Setting (Gmax), s			8.0	18.5		40.5		31.0				
Max Q Clear Time (g_c+I1), s			7.3	12.6		32.9		9.2				
Green Ext Time (p_c), s			0.1	0.8		6.8		1.4				
Intersection Summary												
HCM 2010 Ctrl Delay				34.2								
HCM 2010 LOS				C								

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

BioMarin
Cumulative Conditions
PM Peak Hour

Intersection 15 Brooks St/3rd St Side-street Stop
















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	40	36	90.2%	12.4	4.5	B
	Through	5	4	76.8%	19.2	17.7	C
	Right Turn						
	Subtotal	45	40	88.7%	13.9	6.8	B
SB	Left Turn						
	Through	15	13	89.6%	29.5	12.0	D
	Right Turn	10	8	84.5%	18.7	18.1	C
	Subtotal	25	22	87.6%	24.7	13.3	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	65	65	99.8%	3.3	0.5	A
	Through	1,820	1,787	98.2%	2.8	0.8	A
	Right Turn	10	10	96.0%	2.0	0.5	A
	Subtotal	1,895	1,861	98.2%	2.9	0.8	A
Total		1,965	1,923	97.9%	3.3	0.8	A

Intersection 16 Lindaro St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	120	122	101.4%	33.1	3.6	C
	Through	20	25	122.9%	28.7	5.0	C
	Right Turn						
	Subtotal	140	146	104.5%	32.5	2.7	C
SB	Left Turn						
	Through	50	51	102.1%	27.7	6.2	C
	Right Turn	10	13	126.7%	15.0	10.3	B
	Subtotal	60	64	106.2%	26.2	5.1	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	230	253	110.2%	8.0	1.4	A
	Through	1,850	1,787	96.6%	7.1	1.9	A
	Right Turn	40	41	101.8%	6.1	3.4	A
	Subtotal	2,120	2,081	98.2%	7.2	1.7	A
Total		2,320	2,291	98.7%	9.4	1.5	A


















HCM 2010 Signalized Intersection Summary
17: Lincoln & 3rd

Cumulative Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	110	1800	150	50	340	0	0	285	160
Future Volume (veh/h)	0	0	0	110	1800	150	50	340	0	0	285	160
Number				1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	0.98		1.00	1.00		0.83
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1620	1588	1620	1620	1588	0	0	1525	1555
Adj Flow Rate, veh/h				115	1875	145	52	354	0	0	297	160
Adj No. of Lanes				0	3	0	0	2	0	0	2	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				132	2285	181	103	670	0	0	541	274
Arrive On Green				0.19	0.19	0.19	0.63	0.63	0.00	0.00	0.10	0.10
Sat Flow, veh/h				230	3979	316	148	2209	0	0	1801	876
Grp Volume(v), veh/h				788	656	690	198	208	0	0	246	211
Grp Sat Flow(s),veh/h/ln				1577	1445	1503	912	1373	0	0	1448	1152
Q Serve(g_s), s				38.8	34.6	35.1	3.8	6.5	0.0	0.0	12.9	13.9
Cycle Q Clear(g_c), s				38.8	34.6	35.1	17.8	6.5	0.0	0.0	12.9	13.9
Prop In Lane				0.15		0.21	0.26		0.00	0.00		0.76
Lane Grp Cap(c), veh/h				905	830	863	343	430	0	0	454	361
V/C Ratio(X)				0.87	0.79	0.80	0.58	0.48	0.00	0.00	0.54	0.58
Avail Cap(c_a), veh/h				936	858	892	343	430	0	0	454	361
HCM Platoon Ratio				0.33	0.33	0.33	2.00	2.00	1.00	1.00	0.33	0.33
Upstream Filter(I)				0.30	0.30	0.30	1.00	1.00	0.00	0.00	0.88	0.88
Uniform Delay (d), s/veh				29.5	27.8	28.0	12.5	11.5	0.0	0.0	30.4	30.9
Incr Delay (d2), s/veh				2.9	1.5	1.6	6.9	3.9	0.0	0.0	4.1	6.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				17.7	14.2	15.0	2.7	2.9	0.0	0.0	5.7	5.0
LnGrp Delay(d),s/veh				32.4	29.4	29.6	19.4	15.3	0.0	0.0	34.5	36.8
LnGrp LOS				C	C	C	B	B			C	D
Approach Vol, veh/h					2135			406			457	
Approach Delay, s/veh					30.6			17.3			35.6	
Approach LOS					C			B			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				29.6		50.4		29.6				
Change Period (Y+Rc), s				4.5		4.5		4.5				
Max Green Setting (Gmax), s				23.5		47.5		23.5				
Max Q Clear Time (g_c+I1), s				19.8		40.8		15.9				
Green Ext Time (p_c), s				0.7		5.1		1.3				
Intersection Summary												
HCM 2010 Ctrl Delay				29.6								
HCM 2010 LOS				C								

HCM Signalized Intersection Capacity Analysis
18: Tamalpais & 3rd


















Cumulative Conditions
Timing Plan: PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					  								
Traffic Volume (vph)	0	0	0	350	1920	50	125	55	0	0	0	0	
Future Volume (vph)	0	0	0	350	1920	50	125	55	0	0	0	0	
Ideal Flow (vphpl)	1800	1800	1800	1600	1600	1600	1600	1600	1800	1800	1600	1600	
Lane Width	12	12	12	12	12	12	11	12	12	12	12	12	
Total Lost time (s)					11.6		7.6	7.6					
Lane Util. Factor					0.91		1.00	1.00					
Frbp, ped/bikes					1.00		1.00	1.00					
Flpb, ped/bikes					0.96		0.96	1.00					
Frt					1.00		1.00	1.00					
Flt Protected					0.99		0.95	1.00					
Satd. Flow (prot)					3666		1098	1249					
Flt Permitted					0.99		0.95	1.00					
Satd. Flow (perm)					3666		1098	1249					
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0	0	0	365	2000	52	130	57	0	0	0	0	
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	2414	0	130	57	0	0	0	0	
Confl. Peds. (#/hr)			106	106		44	30		69			30	
Confl. Bikes (#/hr)						2			3			8	
Parking (#/hr)							3	3			3	3	
Turn Type				Perm	NA		Perm	NA					
Protected Phases					6			4					
Permitted Phases				6			4						
Actuated Green, G (s)					51.8		19.0	19.0					
Effective Green, g (s)					51.8		19.0	19.0					
Actuated g/C Ratio					0.58		0.21	0.21					
Clearance Time (s)					11.6		7.6	7.6					
Vehicle Extension (s)					5.0		5.0	5.0					
Lane Grp Cap (vph)					2109		231	263					
v/s Ratio Prot								0.05					
v/s Ratio Perm					0.66		c0.12						
v/c Ratio					1.14		0.56	0.22					
Uniform Delay, d1					19.1		31.8	29.3					
Progression Factor					1.00		1.00	1.00					
Incremental Delay, d2					71.3		5.1	0.9					
Delay (s)					90.4		36.9	30.2					
Level of Service					F		D	C					
Approach Delay (s)		0.0			90.4			34.8			0.0		
Approach LOS		A			F			C			A		
Intersection Summary													
HCM 2000 Control Delay			86.4		HCM 2000 Level of Service				F				
HCM 2000 Volume to Capacity ratio			0.99										
Actuated Cycle Length (s)			90.0		Sum of lost time (s)				19.2				
Intersection Capacity Utilization			160.1%		ICU Level of Service				H				
Analysis Period (min)			15										

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 19: Hetherton & 3rd













Cumulative Conditions
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	510	1720	0	0	0	0	0	725	585
Future Volume (veh/h)	0	0	0	510	1720	0	0	0	0	0	725	585
Number				1	6	16				3	8	18
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.86
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1560	1588	0				0	1588	1500
Adj Flow Rate, veh/h				531	1792	0				0	755	601
Adj No. of Lanes				1	3	0				0	3	1
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				716	2008	0				0	2021	510
Arrive On Green				0.14	0.14	0.00				0.00	0.15	0.15
Sat Flow, veh/h				1486	4765	0				0	4479	1093
Grp Volume(v), veh/h				531	1792	0				0	755	601
Grp Sat Flow(s),veh/h/ln				1486	1588	0				0	1445	1093
Q Serve(g_s), s				27.9	29.6	0.0				0.0	12.5	37.3
Cycle Q Clear(g_c), s				27.9	29.6	0.0				0.0	12.5	37.3
Prop In Lane				1.00		0.00				0.00		1.00
Lane Grp Cap(c), veh/h				716	2008	0				0	2021	510
V/C Ratio(X)				0.74	0.89	0.00				0.00	0.37	1.18
Avail Cap(c_a), veh/h				721	2025	0				0	2021	510
HCM Platoon Ratio				0.33	0.33	1.00				1.00	0.33	0.33
Upstream Filter(l)				0.09	0.09	0.00				0.00	0.83	0.83
Uniform Delay (d), s/veh				31.9	32.7	0.0				0.0	23.4	33.8
Incr Delay (d2), s/veh				0.4	0.5	0.0				0.0	0.4	96.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.6	13.1	0.0				0.0	5.1	25.0
LnGrp Delay(d),s/veh				32.3	33.2	0.0				0.0	23.8	130.7
LnGrp LOS				C	C						C	F
Approach Vol, veh/h					2323						1356	
Approach Delay, s/veh					33.0						71.2	
Approach LOS					C						E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs						6		8				
Phs Duration (G+Y+Rc), s						37.7		42.3				
Change Period (Y+Rc), s						4.0		5.0				
Max Green Setting (Gmax), s						34.0		37.0				
Max Q Clear Time (g_c+I1), s						31.6		39.3				
Green Ext Time (p_c), s						2.1		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay					47.1							
HCM 2010 LOS					D							
Notes												
User approved volume balancing among the lanes for turning movement.												

User approved ignoring U-Turning movement.



















HCM 2010 Signalized Intersection Summary
20: Irwin & 3rd/3rd St

Cumulative Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑	↑	↑↑↑				
Traffic Volume (veh/h)	0	0	0	0	1235	210	990	1430	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1235	210	990	1430	0	0	0	0
Number				1	6	16	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.93	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1500	1500	1398	1398	0			
Adj Flow Rate, veh/h				0	1286	197	1100	1394	0			
Adj No. of Lanes				0	3	1	2	2	0			
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %				0	2	2	3	3	0			
Cap, veh/h				0	1254	363	1548	1625	0			
Arrive On Green				0.00	0.31	0.31	0.19	0.19	0.00			
Sat Flow, veh/h				0	4230	1184	2663	2796	0			
Grp Volume(v), veh/h				0	1286	197	1100	1394	0			
Grp Sat Flow(s),veh/h/ln				0	1365	1184	1331	1398	0			
Q Serve(g_s), s				0.0	24.5	11.1	30.9	38.6	0.0			
Cycle Q Clear(g_c), s				0.0	24.5	11.1	30.9	38.6	0.0			
Prop In Lane				0.00		1.00	1.00		0.00			
Lane Grp Cap(c), veh/h				0	1254	363	1548	1625	0			
V/C Ratio(X)				0.00	1.03	0.54	0.71	0.86	0.00			
Avail Cap(c_a), veh/h				0	1254	363	1548	1625	0			
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	0.09	0.09	0.00			
Uniform Delay (d), s/veh				0.0	27.8	23.1	26.0	29.1	0.0			
Incr Delay (d2), s/veh				0.0	32.1	1.7	0.3	0.6	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	12.9	3.8	11.5	15.0	0.0			
LnGrp Delay(d),s/veh				0.0	59.8	24.8	26.3	29.7	0.0			
LnGrp LOS					F	C	C	C				
Approach Vol, veh/h					1483			2494				
Approach Delay, s/veh					55.2			28.2				
Approach LOS					E			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				51.0		29.0						
Change Period (Y+Rc), s				4.5		4.5						
Max Green Setting (Gmax), s				46.5		24.5						
Max Q Clear Time (g_c+I1), s				40.6		26.5						
Green Ext Time (p_c), s				5.1		0.0						
Intersection Summary												
HCM 2010 Ctrl Delay				38.3								
HCM 2010 LOS				D								
Notes												













HCM 2010 Signalized Intersection Summary
21: D & 2nd

Cumulative Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  										
Traffic Volume (veh/h)	0	1625	110	0	0	0	0	0	435	185	470	0
Future Volume (veh/h)	0	1625	110	0	0	0	0	0	435	185	470	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.96	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1676	1710				0	1588	1620	1765	1765	0
Adj Flow Rate, veh/h	0	1693	106				0	0	439	193	490	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	0	0	0				0	0	575	238	781	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.44	0.15	0.15	0.00
Sat Flow, veh/h		0					0	0	1300	933	1765	0
Grp Volume(v), veh/h		0.0					0	0	439	193	490	0
Grp Sat Flow(s),veh/h/ln							0	0	1300	933	1765	0
Q Serve(g_s), s							0.0	0.0	22.7	12.7	20.9	0.0
Cycle Q Clear(g_c), s							0.0	0.0	22.7	35.4	20.9	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	575	238	781	0
V/C Ratio(X)							0.00	0.00	0.76	0.81	0.63	0.00
Avail Cap(c_a), veh/h							0	0	575	238	781	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	0.74	0.74	0.00
Uniform Delay (d), s/veh							0.0	0.0	18.8	47.0	28.0	0.0
Incr Delay (d2), s/veh							0.0	0.0	5.4	13.7	0.9	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	8.9	5.2	10.4	0.0
LnGrp Delay(d),s/veh							0.0	0.0	24.2	60.7	28.9	0.0
LnGrp LOS									C	E	C	
Approach Vol, veh/h								439			683	
Approach Delay, s/veh								24.2			37.9	
Approach LOS								C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				40.0				40.0				
Change Period (Y+Rc), s				4.6				4.6				
Max Green Setting (Gmax), s				35.4				35.4				
Max Q Clear Time (g_c+I1), s				37.4				24.7				
Green Ext Time (p_c), s				0.0				1.1				
Intersection Summary												
HCM 2010 Ctrl Delay			32.5									
HCM 2010 LOS			C									













HCM 2010 Signalized Intersection Summary
22: C & 2nd

Cumulative Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑↑				
Traffic Volume (veh/h)	200	2050	0	0	0	0	0	260	120	0	0	0
Future Volume (veh/h)	200	2050	0	0	0	0	0	260	120	0	0	0
Number	1	6	16				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1440	1500	0				0	1500	1440			
Adj Flow Rate, veh/h	208	2135	0				0	271	117			
Adj No. of Lanes	0	3	0				0	2	0			
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0				0	2	2			
Cap, veh/h	299	2663	0				0	376	157			
Arrive On Green	0.23	0.23	0.00				0.00	0.19	0.19			
Sat Flow, veh/h	346	3798	0				0	1992	833			
Grp Volume(v), veh/h	818	1525	0				0	202	186			
Grp Sat Flow(s),veh/h/ln	1414	1365	0				0	1500	1325			
Q Serve(g_s), s	42.0	42.1	0.0				0.0	10.1	10.6			
Cycle Q Clear(g_c), s	43.9	42.1	0.0				0.0	10.1	10.6			
Prop In Lane	0.25		0.00				0.00		0.63			
Lane Grp Cap(c), veh/h	1048	1914	0				0	283	250			
V/C Ratio(X)	0.78	0.80	0.00				0.00	0.71	0.74			
Avail Cap(c_a), veh/h	1048	1914	0				0	390	344			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	0.37	0.37	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	26.0	25.4	0.0				0.0	30.4	30.6			
Incr Delay (d2), s/veh	2.2	1.3	0.0				0.0	7.2	9.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	17.8	16.3	0.0				0.0	4.7	4.6			
LnGrp Delay(d),s/veh	28.2	26.7	0.0				0.0	37.6	40.4			
LnGrp LOS	C	C						D	D			
Approach Vol, veh/h		2343						388				
Approach Delay, s/veh		27.2						39.0				
Approach LOS		C						D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				19.3		60.7						
Change Period (Y+Rc), s				* 4.2		4.6						
Max Green Setting (Gmax), s				* 21		50.4						
Max Q Clear Time (g_c+I1), s				12.6		45.9						
Green Ext Time (p_c), s				2.0		4.3						
Intersection Summary												
HCM 2010 Ctrl Delay			28.9									
HCM 2010 LOS			C									
Notes												




















HCM 2010 Signalized Intersection Summary
23: B & 2nd

Cumulative Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑		↑	↑	
Traffic Volume (veh/h)	0	2085	90	0	0	0	0	0	250	210	290	0
Future Volume (veh/h)	0	2085	90	0	0	0	0	0	250	210	290	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.90	0.97		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1500	1382				0	1588	1591	1560	1500	0
Adj Flow Rate, veh/h	0	2172	88				0	0	243	219	302	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	0	0	0				0	0	359	205	441	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.29	0.10	0.10	0.00
Sat Flow, veh/h		0					0	0	1221	974	1500	0
Grp Volume(v), veh/h		0.0					0	0	243	219	302	0
Grp Sat Flow(s),veh/h/ln							0	0	1221	974	1500	0
Q Serve(g_s), s							0.0	0.0	14.0	9.5	15.6	0.0
Cycle Q Clear(g_c), s							0.0	0.0	14.0	23.5	15.6	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	359	205	441	0
V/C Ratio(X)							0.00	0.00	0.68	1.07	0.69	0.00
Avail Cap(c_a), veh/h							0	0	359	205	441	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	0.68	0.68	0.00
Uniform Delay (d), s/veh							0.0	0.0	24.9	45.2	32.5	0.0
Incr Delay (d2), s/veh							0.0	0.0	4.2	71.0	2.5	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	5.1	8.6	6.8	0.0
LnGrp Delay(d),s/veh							0.0	0.0	29.1	116.2	35.1	0.0
LnGrp LOS									C	F	D	
Approach Vol, veh/h								243			521	
Approach Delay, s/veh								29.1			69.2	
Approach LOS								C			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				28.0				28.0				
Change Period (Y+Rc), s				4.5				4.5				
Max Green Setting (Gmax), s				23.5				23.5				
Max Q Clear Time (g_c+I1), s				25.5				16.0				
Green Ext Time (p_c), s				0.0				0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				56.4								
HCM 2010 LOS				E								

HCM 2010 Signalized Intersection Summary
24: A & 2nd

Cumulative Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						 				
Traffic Volume (veh/h)	110	2250	185	0	0	0	0	335	30	120	140	0
Future Volume (veh/h)	110	2250	185	0	0	0	0	335	30	120	140	0
Number	5	2	12				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96				1.00		0.90	0.96		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1765	1800				0	1676	1710	1676	1744	0
Adj Flow Rate, veh/h	115	2344	182				0	349	23	125	146	0
Adj No. of Lanes	0	3	0				0	2	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	134	2881	227				0	516	34	161	431	0
Arrive On Green	0.21	0.21	0.21				0.00	0.17	0.17	0.01	0.08	0.00
Sat Flow, veh/h	208	4483	353				0	3096	197	1597	1744	0
Grp Volume(v), veh/h	969	804	869				0	183	189	125	146	0
Grp Sat Flow(s),veh/h/ln	1754	1606	1684				0	1593	1616	1597	1744	0
Q Serve(g_s), s	42.6	37.8	39.2				0.0	8.6	8.8	0.0	6.3	0.0
Cycle Q Clear(g_c), s	42.6	37.8	39.2				0.0	8.6	8.8	0.0	6.3	0.0
Prop In Lane	0.12		0.21				0.00		0.12	1.00		0.00
Lane Grp Cap(c), veh/h	1127	1032	1082				0	273	277	161	431	0
V/C Ratio(X)	0.86	0.78	0.80				0.00	0.67	0.68	0.77	0.34	0.00
Avail Cap(c_a), veh/h	1127	1032	1082				0	321	325	164	482	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	0.16	0.16	0.16				0.00	1.00	1.00	0.63	0.63	0.00
Uniform Delay (d), s/veh	28.0	26.1	26.7				0.0	31.0	31.1	38.4	30.6	0.0
Incr Delay (d2), s/veh	1.5	1.0	1.1				0.0	7.0	7.3	15.6	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.1	17.1	18.6				0.0	4.3	4.4	3.5	3.1	0.0
LnGrp Delay(d),s/veh	29.5	27.1	27.8				0.0	38.0	38.4	54.0	31.2	0.0
LnGrp LOS	C	C	C					D	D	D	C	
Approach Vol, veh/h		2641						372			271	
Approach Delay, s/veh		28.2						38.2			41.7	
Approach LOS		C						D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		56.0		24.0			6.1	17.9				
Change Period (Y+Rc), s		4.6		* 4.2			* 4.2	* 4.2				
Max Green Setting (Gmax), s		49.1		* 22			* 2	* 16				
Max Q Clear Time (g_c+I1), s		44.6		8.3			2.0	10.8				
Green Ext Time (p_c), s		4.5		0.8			0.0	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			30.5									
HCM 2010 LOS			C									
Notes												

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

BioMarin
Cumulative Conditions
PM Peak Hour

Intersection 25 Brooks St/2nd St Side-street Stop


















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	80	73	91.7%	27.5	4.6	D
	Through						
	Right Turn						
	Subtotal	80	73	91.7%	27.5	4.6	D
EB	Left Turn	45	41	92.2%	3.0	0.3	A
	Through	2,390	2,380	99.6%	2.7	0.2	A
	Right Turn						
	Subtotal	2,435	2,422	99.4%	2.7	0.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,515	2,495	99.2%	3.4	0.3	A

Intersection 26 Lindero St/2nd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	80	75	93.6%	20.9	4.8	C
	Right Turn	310	312	100.6%	19.7	1.7	B
	Subtotal	390	387	99.2%	20.1	1.7	C
SB	Left Turn	110	129	117.3%	30.5	6.1	C
	Through	170	170	100.1%	24.3	3.6	C
	Right Turn						
	Subtotal	280	299	106.8%	26.8	3.6	C
EB	Left Turn	60	62	103.0%	13.8	2.3	B
	Through	2,340	2,301	98.3%	12.6	1.0	B
	Right Turn	40	35	86.4%	8.4	3.3	A
	Subtotal	2,440	2,397	98.2%	12.6	0.9	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,110	3,083	99.1%	14.9	1.0	B




















HCM 2010 Signalized Intersection Summary
27: Lincoln & 2nd

Cumulative Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	2410	60	0	0	0	0	210	140	150	190	0
Future Volume (veh/h)	230	2410	60	0	0	0	0	210	140	150	190	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1412	1412				0	1412	1412	1382	1355	0
Adj Flow Rate, veh/h	240	2510	40				0	219	134	156	198	0
Adj No. of Lanes	0	4	1				0	1	1	0	2	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	230	2589	657				0	473	389	246	409	0
Arrive On Green	0.18	0.18	0.18				0.00	0.34	0.34	0.67	0.67	0.00
Sat Flow, veh/h	410	4624	1172				0	1412	1161	477	1281	0
Grp Volume(v), veh/h	815	1935	40				0	219	134	169	185	0
Grp Sat Flow(s),veh/h/ln	1391	1214	1172				0	1412	1161	525	1172	0
Q Serve(g_s), s	44.8	42.0	2.3				0.0	9.8	6.9	15.9	6.1	0.0
Cycle Q Clear(g_c), s	44.8	42.0	2.3				0.0	9.8	6.9	25.6	6.1	0.0
Prop In Lane	0.29		1.00				0.00		1.00	0.92		0.00
Lane Grp Cap(c), veh/h	779	2040	657				0	473	389	262	393	0
V/C Ratio(X)	1.05	0.95	0.06				0.00	0.46	0.34	0.64	0.47	0.00
Avail Cap(c_a), veh/h	779	2040	657				0	473	389	262	393	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	0.28	0.28	0.28				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.6	31.5	15.3				0.0	20.9	20.0	17.5	9.8	0.0
Incr Delay (d2), s/veh	30.6	4.0	0.1				0.0	0.7	0.5	5.3	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	23.9	14.9	0.7				0.0	3.9	2.3	4.0	1.9	0.0
LnGrp Delay(d),s/veh	63.2	35.4	15.3				0.0	21.6	20.5	22.8	10.7	0.0
LnGrp LOS	F	D	B					C	C	C	B	
Approach Vol, veh/h		2790						353			354	
Approach Delay, s/veh		43.3						21.2			16.4	
Approach LOS		D						C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		49.0		31.0				31.0				
Change Period (Y+Rc), s		* 4.2		* 4.2				* 4.2				
Max Green Setting (Gmax), s		* 45		* 27				* 27				
Max Q Clear Time (g_c+I1), s		46.8		11.8				27.6				
Green Ext Time (p_c), s		0.0		1.3				0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			38.3									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary
 28: Francisco W./Tamalpais & 2nd

Cumulative Conditions
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	2540	120	0	0	0	0	150	370	85	255	0
Future Volume (veh/h)	40	2540	120	0	0	0	0	150	370	85	255	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1412	1412				0	1412	1468	1412	1412	0
Adj Flow Rate, veh/h	42	2646	77				0	156	351	89	266	0
Adj No. of Lanes	0	4	1				0	1	1	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	39	2619	587				0	439	379	250	439	0
Arrive On Green	0.17	0.17	0.17				0.00	0.31	0.31	0.62	0.62	0.00
Sat Flow, veh/h	74	4977	1116				0	1412	1217	710	1412	0
Grp Volume(v), veh/h	802	1886	77				0	156	351	89	266	0
Grp Sat Flow(s),veh/h/ln	1408	1214	1116				0	1412	1217	710	1412	0
Q Serve(g_s), s	42.1	41.3	4.7				0.0	6.8	22.3	7.3	9.1	0.0
Cycle Q Clear(g_c), s	42.1	41.3	4.7				0.0	6.8	22.3	14.2	9.1	0.0
Prop In Lane	0.05		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	741	1917	587				0	439	379	250	439	0
V/C Ratio(X)	1.08	0.98	0.13				0.00	0.35	0.93	0.36	0.61	0.00
Avail Cap(c_a), veh/h	741	1917	587				0	468	403	265	468	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	0.21	0.21	0.21				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.1	32.7	17.6				0.0	21.3	26.7	15.6	12.1	0.0
Incr Delay (d2), s/veh	42.8	6.5	0.1				0.0	0.5	26.6	0.9	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	25.2	15.1	1.5				0.0	2.7	10.3	1.5	3.6	0.0
LnGrp Delay(d),s/veh	75.9	39.2	17.7				0.0	21.8	53.2	16.4	14.1	0.0
LnGrp LOS	F	D	B					C	D	B	B	
Approach Vol, veh/h		2765						507			355	
Approach Delay, s/veh		49.3						43.6			14.7	
Approach LOS		D						D			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		48.6		31.4				31.4				
Change Period (Y+Rc), s		6.5		6.5				6.5				
Max Green Setting (Gmax), s		40.5		26.5				26.5				
Max Q Clear Time (g_c+I1), s		44.1		24.3				16.2				
Green Ext Time (p_c), s		0.0		0.6				1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			45.1									
HCM 2010 LOS			D									





















HCM 2010 Signalized Intersection Summary
 29: 101 SBO on Hetherton/Hetherton & 2nd/2nd St

Cumulative Conditions
 Timing Plan: PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1910	1080	0	0	0	0	0	0	390	845	0
Future Volume (veh/h)	0	1910	1080	0	0	0	0	0	0	390	845	0
Number	5	2	12							7	4	14
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1500	1500							1500	1500	0
Adj Flow Rate, veh/h	0	1966	1105							406	880	0
Adj No. of Lanes	0	3	2							1	2	0
Peak Hour Factor	0.96	0.96	0.96							0.96	0.96	0.96
Percent Heavy Veh, %	0	2	2							2	2	0
Cap, veh/h	0	2271	1287							475	998	0
Arrive On Green	0.00	0.17	0.17							0.11	0.11	0.00
Sat Flow, veh/h	0	4500	2550							1429	3000	0
Grp Volume(v), veh/h	0	1966	1105							406	880	0
Grp Sat Flow(s),veh/h/ln	0	1500	1275							1429	1500	0
Q Serve(g_s), s	0.0	34.0	33.7							22.3	23.1	0.0
Cycle Q Clear(g_c), s	0.0	34.0	33.7							22.3	23.1	0.0
Prop In Lane	0.00		1.00							1.00		0.00
Lane Grp Cap(c), veh/h	0	2271	1287							475	998	0
V/C Ratio(X)	0.00	0.87	0.86							0.85	0.88	0.00
Avail Cap(c_a), veh/h	0	2271	1287							491	1031	0
HCM Platoon Ratio	1.00	0.33	0.33							0.33	0.33	1.00
Upstream Filter(l)	0.00	0.09	0.09							0.88	0.88	0.00
Uniform Delay (d), s/veh	0.0	30.7	30.6							33.7	34.1	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.8							12.0	7.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.3	12.1							10.4	10.7	0.0
LnGrp Delay(d),s/veh	0.0	31.1	31.3							45.7	42.0	0.0
LnGrp LOS		C	C							D	D	
Approach Vol, veh/h		3071									1286	
Approach Delay, s/veh		31.2									43.1	
Approach LOS		C									D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		48.9		31.1								
Change Period (Y+Rc), s		8.5		4.5								
Max Green Setting (Gmax), s		39.5		27.5								
Max Q Clear Time (g_c+I1), s		36.0		25.1								
Green Ext Time (p_c), s		3.3		1.5								
Intersection Summary												
HCM 2010 Ctrl Delay			34.7									
HCM 2010 LOS			C									
Notes												

HCM 2010 Signalized Intersection Summary
30: Irwin & 2nd St






















Cumulative Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						  				
Traffic Volume (veh/h)	960	1390	0	0	0	0	0	1480	600	0	0	0
Future Volume (veh/h)	960	1390	0	0	0	0	0	1480	600	0	0	0
Number	5	2	12				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.94			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1468	1500	0				0	1412	1412			
Adj Flow Rate, veh/h	1068	1353	0				0	1542	616			
Adj No. of Lanes	2	2	0				0	3	1			
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0				0	2	2			
Cap, veh/h	1466	1380	0				0	1628	479			
Arrive On Green	0.15	0.15	0.00				0.00	0.42	0.42			
Sat Flow, veh/h	2797	3000	0				0	3981	1133			
Grp Volume(v), veh/h	1068	1353	0				0	1542	616			
Grp Sat Flow(s),veh/h/ln	1398	1500	0				0	1285	1133			
Q Serve(g_s), s	29.6	36.0	0.0				0.0	30.8	33.8			
Cycle Q Clear(g_c), s	29.6	36.0	0.0				0.0	30.8	33.8			
Prop In Lane	1.00		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	1466	1380	0				0	1628	479			
V/C Ratio(X)	0.73	0.98	0.00				0.00	0.95	1.29			
Avail Cap(c_a), veh/h	1466	1380	0				0	1628	479			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	30.9	33.6	0.0				0.0	22.2	23.1			
Incr Delay (d2), s/veh	0.3	4.0	0.0				0.0	12.3	144.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	11.5	15.7	0.0				0.0	12.7	29.7			
LnGrp Delay(d),s/veh	31.2	37.6	0.0				0.0	34.5	167.3			
LnGrp LOS	C	D						C	F			
Approach Vol, veh/h		2421						2158				
Approach Delay, s/veh		34.8						72.4				
Approach LOS		C						E				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		41.0		39.0								
Change Period (Y+Rc), s		* 4.2		* 5.2								
Max Green Setting (Gmax), s		* 37		* 34								
Max Q Clear Time (g_c+I1), s		38.0		35.8								
Green Ext Time (p_c), s		0.0		0.0								
Intersection Summary												
HCM 2010 Ctrl Delay			52.5									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

31: Lindaro & Andersen

Cumulative Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	300	40	80	300	50	70	235	180	90	130	30
Future Volume (veh/h)	20	300	40	80	300	50	70	235	180	90	130	30
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.96	1.00		0.93
Parking Bus, Adj	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 Sat Flow, veh/h/ln	2039	2039	2000	1961	1961	2000	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	21	312	36	83	312	45	73	245	155	94	135	21
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	57	402	46	161	469	68	258	310	196	207	416	65
Arrive On Green	0.03	0.22	0.22	0.09	0.28	0.28	0.15	0.30	0.30	0.12	0.27	0.27
Sat Flow, veh/h	1942	1786	206	1867	1667	240	1774	1048	663	1774	1556	242
Grp Volume(v), veh/h	21	0	348	83	0	357	73	0	400	94	0	156
Grp Sat Flow(s),veh/h/ln	1942	0	1992	1867	0	1907	1774	0	1711	1774	0	1798
Q Serve(g_s), s	0.7	0.0	10.1	2.6	0.0	10.2	2.3	0.0	13.3	3.1	0.0	4.3
Cycle Q Clear(g_c), s	0.7	0.0	10.1	2.6	0.0	10.2	2.3	0.0	13.3	3.1	0.0	4.3
Prop In Lane	1.00		0.10	1.00		0.13	1.00		0.39	1.00		0.13
Lane Grp Cap(c), veh/h	57	0	448	161	0	537	258	0	507	207	0	480
V/C Ratio(X)	0.37	0.00	0.78	0.52	0.00	0.66	0.28	0.00	0.79	0.45	0.00	0.32
Avail Cap(c_a), veh/h	251	0	744	302	0	774	287	0	686	287	0	721
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.5	0.0	22.5	27.0	0.0	19.6	23.6	0.0	20.0	25.5	0.0	18.2
Incr Delay (d2), s/veh	1.5	0.0	2.9	1.0	0.0	1.4	0.2	0.0	4.4	0.6	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	5.9	1.4	0.0	5.6	1.1	0.0	6.8	1.5	0.0	2.2
LnGrp Delay(d),s/veh	30.9	0.0	25.4	28.0	0.0	21.1	23.8	0.0	24.4	26.1	0.0	18.6
LnGrp LOS	C		C	C		C	C		C	C		B
Approach Vol, veh/h		369			440			473			250	
Approach Delay, s/veh		25.8			22.4			24.3			21.4	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.3	18.8	13.0	20.7	5.8	22.3	11.2	22.5				
Change Period (Y+Rc), s	4.0	4.9	4.0	* 4.2	4.0	4.9	4.0	* 4.2				
Max Green Setting (Gmax), s	10.0	23.1	10.0	* 25	8.0	25.1	10.0	* 25				
Max Q Clear Time (g_c+I1), s	4.6	12.1	4.3	6.3	2.7	12.2	5.1	15.3				
Green Ext Time (p_c), s	0.1	1.1	0.0	0.5	0.0	1.2	0.1	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			23.6									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis
 32: Tamalpais & Mission

Cumulative Conditions
 Timing Plan: PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻		
Traffic Volume (vph)	520	60	0	685	0	0
Future Volume (vph)	520	60	0	685	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0			3.0		
Lane Util. Factor	1.00			1.00		
Frbp, ped/bikes	0.99			1.00		
Flpb, ped/bikes	1.00			1.00		
Frt	0.99			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	1557			1588		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	1557			1588		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	542	62	0	714	0	0
RTOR Reduction (vph)	5	0	0	0	0	0
Lane Group Flow (vph)	600	0	0	714	0	0
Confl. Peds. (#/hr)		10	10		10	
Turn Type	NA			NA		
Protected Phases	2			3 4 6		
Permitted Phases						
Actuated Green, G (s)	36.4			56.5		
Effective Green, g (s)	36.4			50.5		
Actuated g/C Ratio	0.45			0.63		
Clearance Time (s)	6.0					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	708			1002		
v/s Ratio Prot	c0.38			c0.45		
v/s Ratio Perm						
v/c Ratio	0.85			0.71		
Uniform Delay, d1	19.3			9.9		
Progression Factor	0.62			0.37		
Incremental Delay, d2	10.2			0.6		
Delay (s)	22.2			4.3		
Level of Service	C			A		
Approach Delay (s)	22.2			4.3	0.0	
Approach LOS	C			A	A	

















Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	94.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

33: Tamalpais & 5th

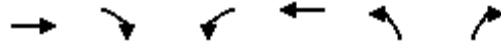
Cumulative Conditions

Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	500	60	0	330	0	0	0	0	30	20	20
Future Volume (vph)	0	500	60	0	330	0	0	0	0	30	20	20
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0			6.0						6.0	
Lane Util. Factor		1.00			1.00						1.00	
Frbp, ped/bikes		0.99			1.00						0.99	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.99			1.00						0.96	
Flt Protected		1.00			1.00						0.98	
Satd. Flow (prot)		1557			1588						1476	
Flt Permitted		1.00			1.00						0.98	
Satd. Flow (perm)		1557			1588						1476	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	521	62	0	344	0	0	0	0	31	21	21
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	0	19	0
Lane Group Flow (vph)	0	580	0	0	344	0	0	0	0	0	54	0
Confl. Peds. (#/hr)	10		10	10		10	10					10
Turn Type		NA			NA					Perm	NA	
Protected Phases		2			4	6					8	
Permitted Phases										8		
Actuated Green, G (s)		42.7			58.9						9.1	
Effective Green, g (s)		42.7			58.9						9.1	
Actuated g/C Ratio		0.53			0.74						0.11	
Clearance Time (s)		6.0									6.0	
Vehicle Extension (s)		3.0									1.5	
Lane Grp Cap (vph)		831			1169						167	
v/s Ratio Prot		c0.37			c0.22							
v/s Ratio Perm											0.04	
v/c Ratio		0.70			0.29						0.33	
Uniform Delay, d1		13.9			3.6						32.6	
Progression Factor		0.65			0.06						0.64	
Incremental Delay, d2		3.7			0.0						0.3	
Delay (s)		12.6			0.3						21.2	
Level of Service		B			A						C	
Approach Delay (s)		12.6			0.3			0.0			21.2	
Approach LOS		B			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			9.0			HCM 2000 Level of Service			A			
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			80.0			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			85.5%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 34: Tamalpais & Mission

Cumulative Conditions
 Timing Plan: PM Peak Hour















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Traffic Volume (vph)	520	0	0	675	10	20
Future Volume (vph)	520	0	0	675	10	20
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0			6.0	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.91	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	1588			1588	1420	
Flt Permitted	1.00			1.00	0.98	
Satd. Flow (perm)	1588			1588	1420	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	542	0	0	703	10	21
RTOR Reduction (vph)	0	0	0	0	17	0
Lane Group Flow (vph)	542	0	0	703	14	0
Confl. Peds. (#/hr)		10				
Turn Type	NA			NA	Prot	
Protected Phases	2 8			6	3 4	
Permitted Phases						
Actuated Green, G (s)	54.3			36.4	14.1	
Effective Green, g (s)	48.7			36.4	14.1	
Actuated g/C Ratio	0.61			0.45	0.18	
Clearance Time (s)				6.0		
Vehicle Extension (s)				3.0		
Lane Grp Cap (vph)	966			722	250	
v/s Ratio Prot	c0.34			c0.44	c0.01	
v/s Ratio Perm						
v/c Ratio	0.56			0.97	0.05	
Uniform Delay, d1	9.3			21.3	27.4	
Progression Factor	0.22			1.07	1.93	
Incremental Delay, d2	0.4			22.2	0.0	
Delay (s)	2.4			45.0	52.9	
Level of Service	A			D	D	
Approach Delay (s)	2.4			45.0	52.9	
Approach LOS	A			D	D	
Intersection Summary						
HCM 2000 Control Delay			27.1		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.72			
Actuated Cycle Length (s)			80.0		Sum of lost time (s)	20.2
Intersection Capacity Utilization			94.8%		ICU Level of Service	F
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

35: Tamalpais & 5th













Cumulative Conditions

Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑			↑				
Traffic Volume (vph)	0	530	0	0	310	10	20	20	20	0	0	0
Future Volume (vph)	0	530	0	0	310	10	20	20	20	0	0	0
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		1.00			1.00			1.00				
Frbp, ped/bikes		1.00			1.00			0.99				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			1.00			0.95				
Flt Protected		1.00			1.00			0.98				
Satd. Flow (prot)		1588			1580			1470				
Flt Permitted		1.00			1.00			0.98				
Satd. Flow (perm)		1588			1580			1470				
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	552	0	0	323	10	21	21	21	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	18	0	0	0	0
Lane Group Flow (vph)	0	552	0	0	332	0	0	45	0	0	0	0
Confl. Peds. (#/hr)	10		10			10			10			
Turn Type		NA			NA		Split	NA				
Protected Phases		2 8			6		4	4				
Permitted Phases												
Actuated Green, G (s)		57.8			42.7			10.2				
Effective Green, g (s)		57.8			42.7			10.2				
Actuated g/C Ratio		0.72			0.53			0.13				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			1.5				
Lane Grp Cap (vph)		1147			843			187				
v/s Ratio Prot		c0.35			0.21			c0.03				
v/s Ratio Perm												
v/c Ratio		0.48			0.39			0.24				
Uniform Delay, d1		4.7			11.0			31.4				
Progression Factor		0.15			0.61			1.16				
Incremental Delay, d2		0.1			1.3			0.2				
Delay (s)		0.8			8.0			36.7				
Level of Service		A			A			D				
Approach Delay (s)		0.8			8.0			36.7			0.0	
Approach LOS		A			A			D			A	
Intersection Summary												
HCM 2000 Control Delay			5.7				HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			80.0				Sum of lost time (s)		18.0			
Intersection Capacity Utilization			85.5%				ICU Level of Service		E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 36: Tamalpais & 4th

Cumulative Conditions
 Timing Plan: PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑			↔			↕					
Traffic Volume (vph)	0	465	0	0	420	40	20	15	20	0	0	0	
Future Volume (vph)	0	465	0	0	420	40	20	15	20	0	0	0	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Total Lost time (s)		6.0			6.0			6.0					
Lane Util. Factor		1.00			1.00			1.00					
Frbp, ped/bikes		1.00			0.98			0.99					
Flpb, ped/bikes		1.00			1.00			1.00					
Frt		1.00			0.99			0.95					
Flt Protected		1.00			1.00			0.98					
Satd. Flow (prot)		1588			1546			1469					
Flt Permitted		1.00			1.00			0.98					
Satd. Flow (perm)		1588			1546			1469					
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0	484	0	0	438	42	21	16	21	0	0	0	
RTOR Reduction (vph)	0	0	0	0	4	0	0	17	0	0	0	0	
Lane Group Flow (vph)	0	484	0	0	476	0	0	41	0	0	0	0	
Confl. Peds. (#/hr)	59		21			59			10				
Turn Type		NA			NA		Split	NA					
Protected Phases		2 8			6		4	4					
Permitted Phases													
Actuated Green, G (s)		54.9			35.6			13.5					
Effective Green, g (s)		54.9			35.6			13.5					
Actuated g/C Ratio		0.69			0.45			0.17					
Clearance Time (s)					6.0			6.0					
Vehicle Extension (s)					3.0			3.0					
Lane Grp Cap (vph)		1089			687			247					
v/s Ratio Prot		c0.30			c0.31			c0.03					
v/s Ratio Perm													
v/c Ratio		0.44			0.69			0.16					
Uniform Delay, d1		5.7			17.8			28.4					
Progression Factor		0.18			0.63			1.02					
Incremental Delay, d2		0.3			5.1			0.2					
Delay (s)		1.3			16.3			29.3					
Level of Service		A			B			C					
Approach Delay (s)		1.3			16.3			29.3			0.0		
Approach LOS		A			B			C			A		
Intersection Summary													
HCM 2000 Control Delay			9.9									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.54										
Actuated Cycle Length (s)			80.0									Sum of lost time (s)	17.6
Intersection Capacity Utilization			95.9%									ICU Level of Service	F
Analysis Period (min)			15										
c Critical Lane Group													

Arterial Level of Service

Cumulative Conditions

Timing Plan: AM Peak Hour

Arterial Level of Service: EB 2nd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
D	IV	25	18.1	34.8	52.9	0.07	4.6	F
C	IV	25	18.9	8.7	27.6	0.07	9.3	D
B	IV	25	17.9	29.1	47.0	0.07	5.2	F
A	IV	25	18.5	9.4	27.9	0.07	9.0	E
Lindaro	IV	25	25.3	10.9	36.2	0.14	14.0	C
Lincoln	IV	25	21.4	46.3	67.7	0.10	5.2	F
Francisco W.	IV	25	12.2	66.4	78.6	0.05	2.1	F
101 SBO n 2nd	IV	25	14.2	12.1	26.3	0.05	7.3	E
Total	IV		146.5	217.7	364.2	0.61	6.1	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	59.7	78.7	0.07	3.3	F
Tamalpais	IV	25	14.4	68.7	83.1	0.05	2.3	F
Lincoln	IV	25	13.2	68.5	81.7	0.05	2.2	F
Lindaro	IV	25	21.4	1.0	22.4	0.10	15.6	C
A	IV	25	25.3	9.1	34.4	0.14	14.7	C
B	IV	25	17.9	9.1	27.0	0.07	9.0	E
C	IV	25	19.0	3.6	22.6	0.07	11.4	D
D	IV	25	18.7	1.7	20.4	0.07	12.4	D
Total	IV		148.9	221.4	370.3	0.62	6.1	F

Arterial Level of Service: SB Hetherton

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Mission	IV	29	24.0	19.1	43.1	0.16	13.4	C
5th	IV	25	16.3	13.4	29.7	0.06	7.5	E
4th	IV	25	14.6	7.5	22.1	0.05	8.9	E
3rd	IV	25	17.7	7.9	25.6	0.07	9.4	D
2nd	IV	25	15.6	261.1	276.7	0.06	0.8	F
Total	IV		88.2	309.0	397.2	0.40	3.6	F

Arterial Level of Service: NB Irwin

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
2nd St	IV	30	25.2	60.1	85.3	0.17	7.1	E
3rd St	IV	25	14.8	20.3	35.1	0.06	5.7	F
4th	IV	25	18.3	29.9	48.2	0.07	5.1	F
5th	IV	25	14.6	8.3	22.9	0.06	8.7	E
Mission	IV	25	15.7	6.8	22.5	0.06	9.5	D
Total	IV		88.6	125.4	214.0	0.41	6.8	F

Arterial Level of Service: EB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lincoln	IV	25	28.5	15.7	44.2	0.16	12.9	D
Tamalpais	IV	25	16.0	52.8	68.8	0.06	3.2	F
Tamalpais	IV	25	3.1	2.9	6.0	0.01	7.0	E
Hetherton	IV	25	8.7	21.6	30.3	0.03	3.9	F
Irwin	IV	25	18.9	11.9	30.8	0.07	8.3	E
Total	IV		75.2	104.9	180.1	0.33	6.7	F

Arterial Level of Service: WB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Irwin	IV	25	21.6	26.8	48.4	0.10	7.3	E
Hetherton	IV	25	18.9	36.1	55.0	0.07	4.7	F
Tamalpais	IV	25	8.7	82.6	91.3	0.03	1.3	F
Tamalpais	IV	25	3.1	3.7	6.8	0.01	6.2	F
Lincoln	IV	25	16.0	88.7	104.7	0.06	2.1	F
Total	IV		68.3	237.9	306.2	0.27	3.2	F

Arterial Level of Service

Cumulative Conditions

Timing Plan: PM Peak Hour

Arterial Level of Service: EB 2nd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
D	IV	25	18.1	24.8	42.9	0.07	5.7	F
C	IV	25	18.9	8.4	27.3	0.07	9.4	D
B	IV	25	17.9	18.9	36.8	0.07	6.6	F
A	IV	25	18.5	9.7	28.2	0.07	8.9	E
Lindaro	IV	25	25.3	11.1	36.4	0.14	13.9	C
Lincoln	IV	25	21.4	14.6	36.0	0.10	9.7	D
Francisco W.	IV	25	12.2	61.4	73.6	0.05	2.3	F
101 SBO on Hetherton	IV	25	14.2	72.4	86.6	0.05	2.2	F
Total	IV		146.5	221.3	367.8	0.61	6.0	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	91.2	110.2	0.07	2.3	F
Tamalpais	IV	25	14.4	92.0	106.4	0.05	1.8	F
Lincoln	IV	25	13.2	18.2	31.4	0.05	5.7	F
Lindaro	IV	25	21.4	3.5	24.9	0.10	14.1	C
A	IV	25	25.3	10.8	36.1	0.14	14.0	C
B	IV	25	17.9	9.9	27.8	0.07	8.7	E
C	IV	25	19.0	4.3	23.3	0.07	11.1	D
D	IV	25	18.7	3.8	22.5	0.07	11.3	D
Total	IV		148.9	233.7	382.6	0.62	5.9	F

Arterial Level of Service: SB Hetherton

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Mission	IV	35	22.2	20.3	42.5	0.16	13.5	C
5th	IV	25	16.3	15.7	32.0	0.06	6.9	F
4th	IV	25	14.6	5.6	20.2	0.05	9.8	D
3rd	IV	25	17.7	21.9	39.6	0.07	6.1	F
2nd	IV	25	15.6	45.1	60.7	0.06	3.5	F
Total	IV		86.4	108.6	195.0	0.40	7.4	E

Arterial Level of Service: NB Irwin

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
2nd St	IV	38	19.3	36.3	55.6	0.17	10.9	D
3rd St	IV	25	14.8	11.5	26.3	0.06	7.6	E
4th	IV	25	18.9	12.9	31.8	0.07	8.1	E
5th	IV	25	14.0	13.4	27.4	0.05	6.9	F
Mission	IV	25	15.7	3.8	19.5	0.06	10.9	D
Total	IV		82.7	77.9	160.6	0.41	9.1	D

Arterial Level of Service: EB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lincoln	IV	25	28.5	12.8	41.3	0.16	13.8	C
Tamalpais	IV	25	16.1	24.0	40.1	0.06	5.5	F
Tamalpais	IV	25	4.3	2.3	6.6	0.02	8.9	E
Hetherton	IV	25	7.5	15.1	22.6	0.03	4.5	F
Irwin	IV	25	18.9	14.1	33.0	0.07	7.8	E
Total	IV		75.3	68.3	143.6	0.33	8.4	E

Arterial Level of Service: WB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Irwin	IV	25	21.6	28.4	50.0	0.10	7.1	E
Hetherton	IV	25	18.9	13.9	32.8	0.07	7.8	E
Tamalpais	IV	25	7.5	47.5	55.0	0.03	1.8	F
Tamalpais	IV	25	4.3	2.7	7.0	0.02	8.4	E
Lincoln	IV	25	16.1	88.2	104.3	0.06	2.1	F
Total	IV		68.4	180.7	249.1	0.27	4.0	F

Leisch Method for Weaving Analysis

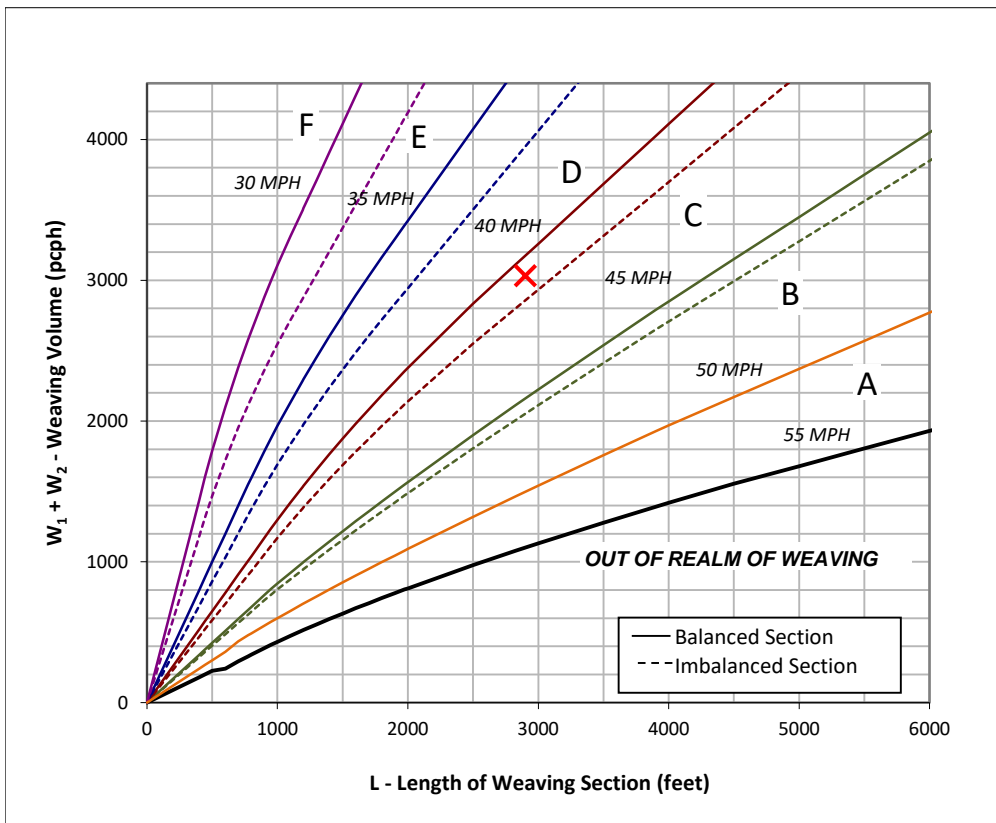
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	5
Length of Weaving Section (feet)	L	2,900

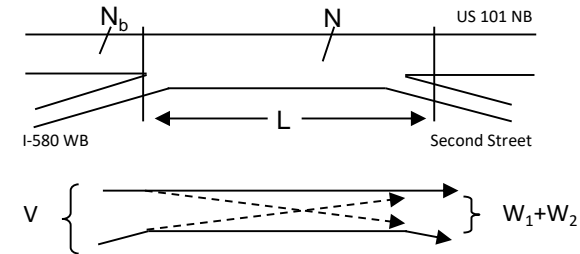
Project Information

Project	BioMarin
Scenario	Cumulative No Project AM Peak Hour
Freeway	US 101 NB
On-ramp	I-580 WB
Off-ramp	Second Street

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	5,956	Volume (vph)*	1,951	Volume (vph)*	957
Truck Percentage	4%	Truck Percentage	4%	Truck Percentage	4%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	2.0
Volume (pcph)	6,218	Volume (pcph)	2,037	Volume (pcph)	996



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
40 MPH and 45 MPH
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 38.9
- Weaving Intensity Factor (k) 2.59
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,561
- Level of Service (LOS) D

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Cumulative No Project Conditions
Project Description	BioMarin - US 101 NB Second Street to Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	4150	Heavy Vehicle Adjustment Factor (f _{HV})	0.919
Peak Hour Factor (PHF)	0.99	Flow Rate (v _{GP}), pc/h/ln	1520
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c _{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.66
Passenger Car Equivalent (E _T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f _{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f _{RLC})	-	Density (D _{GP}), pc/mi/ln	25.3
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS _{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	718	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	820
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.50
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.8
Speed 2 (S_2), mi/h	0.2	Density (D_{ML}), pc/mi/ln	13.7
Speed 2 (S_3), mi/h	1.4	Level of Service (LOS)	B

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Cumulative No Project Conditions
Project Description	BioMarin - US 101 NB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	4	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	2.86
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	1.02
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	6016	Heavy Vehicle Adjustment Factor (f_{HV})	0.889
Peak Hour Factor (PHF)	0.99	Flow Rate ($v_{p,GP}$), pc/h/ln	1709
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.74
Passenger Car Equivalent (E_T)	3.840		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	59.8
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	28.6
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	2.86

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V_{ML}), veh/h	1039	Heavy Vehicle Adjustment Factor (f_{HV})	0.916
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1246
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.76
Passenger Car Equivalent (E_T)	5.597		
Managed Lane Speed and Density			
Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	58.3
Speed 2 (S_2), mi/h	1.7	Density (D_{ML}), pc/mi/ln	21.4
Speed 3 (S_3), mi/h	7.7	Level of Service (LOS)	C

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	4/24/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Cumulative No Project Conditions
Project Description	BioMarin - US 101 SB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	-2.44
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	0.77
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	6221	Heavy Vehicle Adjustment Factor (f_{HV})	0.951
Peak Hour Factor (PHF)	0.97	Flow Rate ($v_{p,GP}$), pc/h/ln	2248
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.98
Passenger Car Equivalent (E_T)	2.180		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	52.4
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	42.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1317	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.94	Flow Rate ($V_{p,ML}$), pc/h/ln	1440
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (E_T)	2.390		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	1
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	44.8
Speed 2 (S_2), mi/h	3.0	Density (D_{ML}), pc/mi/ln	32.1
Speed 2 (S_3), mi/h	12.2	Level of Service (LOS)	D

HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	3/17/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Cumulative No Project Conditions
Project Description	BioMarin - US 101 Mission Ave Slip Off-Ramp		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	3	1
Free-Flow Speed (FFS), mi/h	60.0	50.0
Segment Length (L) / Deceleration Length (L _D), ft	1500	170
Terrain Type	Specific Grade	Specific Grade
Percent Grade, %	-2.44	-1.80
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Volume (V _i), veh/h	6221	1987
Peak Hour Factor (PHF)	0.97	0.92
Total Trucks, %	4.40	3.72
Single-Unit Trucks (SUT), %	66	66
Tractor-Trailers (TT), %	34	34
Heavy Vehicle Adjustment Factor (f _{HV})	0.951	0.958
Flow Rate (v _i), pc/h	6744	2254
Capacity (c), pc/h	6900	2100
Volume-to-Capacity Ratio (v/c)	0.98	1.07

Speed and Density

Upstream Equilibrium Distance (L _{EQ}), ft	103523.5	Density in Ramp Influence Area (D _R), pc/mi/ln	-
Distance to Upstream Ramp (L _{UP}), ft	10000	Speed Index (D _S)	-
Downstream Equilibrium Distance (L _{EQ}), ft	-	Flow Outer Lanes (v _{OA}), pc/h/ln	2299
Distance to Downstream Ramp (L _{DOWN}), ft	10000	Off-Ramp Influence Area Speed (S _R), mi/h	-
Prop. Freeway Vehicles in Lane 1 and 2 (P _{FD})	0.488	Outer Lanes Freeway Speed (S _O), mi/h	60.8
Flow in Lanes 1 and 2 (v ₁₂), pc/h	4445	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (v _{R12}), pc/h	-	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44
Managed Lane Adjustment Factors			
Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V_{ML}), veh/h	1317	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.94	Flow Rate ($V_{p,ML}$), pc/h/ln	1440
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (E_T)	2.390		
Managed Lane Speed and Density			
Breakpoint (BP_{ML})	501	Indicator Variable	1
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	44.8
Speed 2 (S_2), mi/h	3.0	Density (D_{ML}), pc/mi/ln	32.1
Speed 2 (S_3), mi/h	12.2	Level of Service (LOS)	D

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Cumulative No Project Conditions
Project Description	BioMarin - US 101 SB Mission Avenue to Second Street		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	4234	Heavy Vehicle Adjustment Factor (f _{HV})	0.919
Peak Hour Factor (PHF)	0.97	Flow Rate (v _{GP}), pc/h/ln	1583
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c _{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.69
Passenger Car Equivalent (E _T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f _{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f _{RLC})	-	Density (D _{GP}), pc/mi/ln	26.4
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS _{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	998	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.94	Flow Rate ($V_{p,ML}$), pc/h/ln	1104
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.67
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.0
Speed 2 (S_2), mi/h	1.0	Density (D_{ML}), pc/mi/ln	18.7
Speed 2 (S_3), mi/h	5.0	Level of Service (LOS)	C

Leisch Method for Weaving Analysis

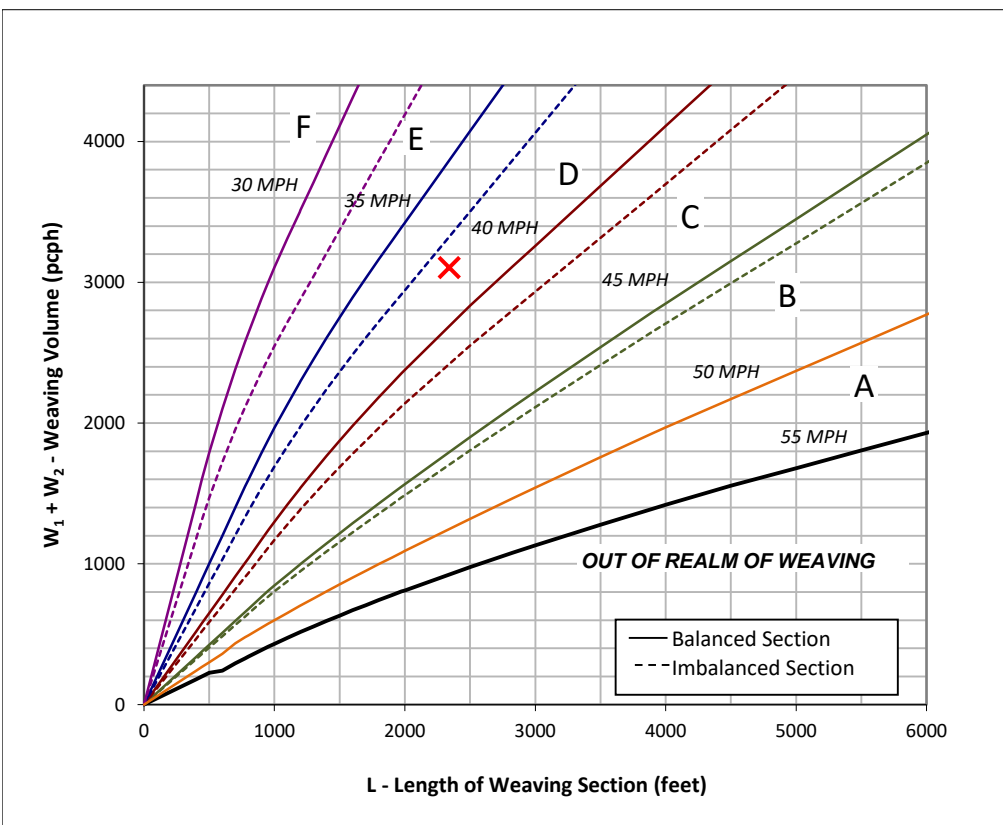
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	2,340

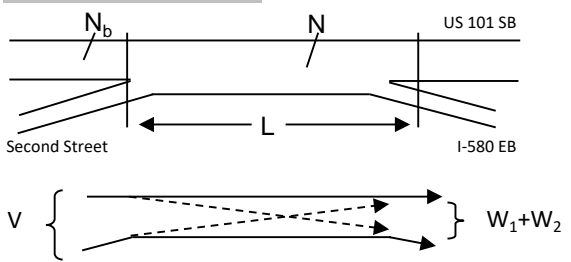
Project Information

Project	BioMarin
Scenario	Cumulative No Project AM Peak Hour
Freeway	US 101 SB
On-ramp	Second Street
Off-ramp	I-580 EB

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	6,712	Volume (vph)*	1,762	Volume (vph)*	1,224
Truck Percentage	4%	Truck Percentage	3%	Truck Percentage	2%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	4.1
Volume (pcph)	7,007	Volume (pcph)	1,809	Volume (pcph)	1,297



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)?	Y
<i>If optional exit lane, then "Y". Otherwise "N".</i>	
2. In the chart to the left, which two speed curves is the red "x" between?	35 MPH and 40 MPH
<i>If left of the 30 MPH curve, LOS is F. Select "-".</i>	
<i>If below the 55 MPH curve, out of the realm of weaving.</i>	
3. Interpolated Weaving Speed (S_w , mph)	38.2
4. Weaving Intensity Factor (k)	2.63
5. Service Volume (SV, pcph)	2,281
$SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$	
6. Level of Service (LOS)	F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

Leisch Method for Weaving Analysis

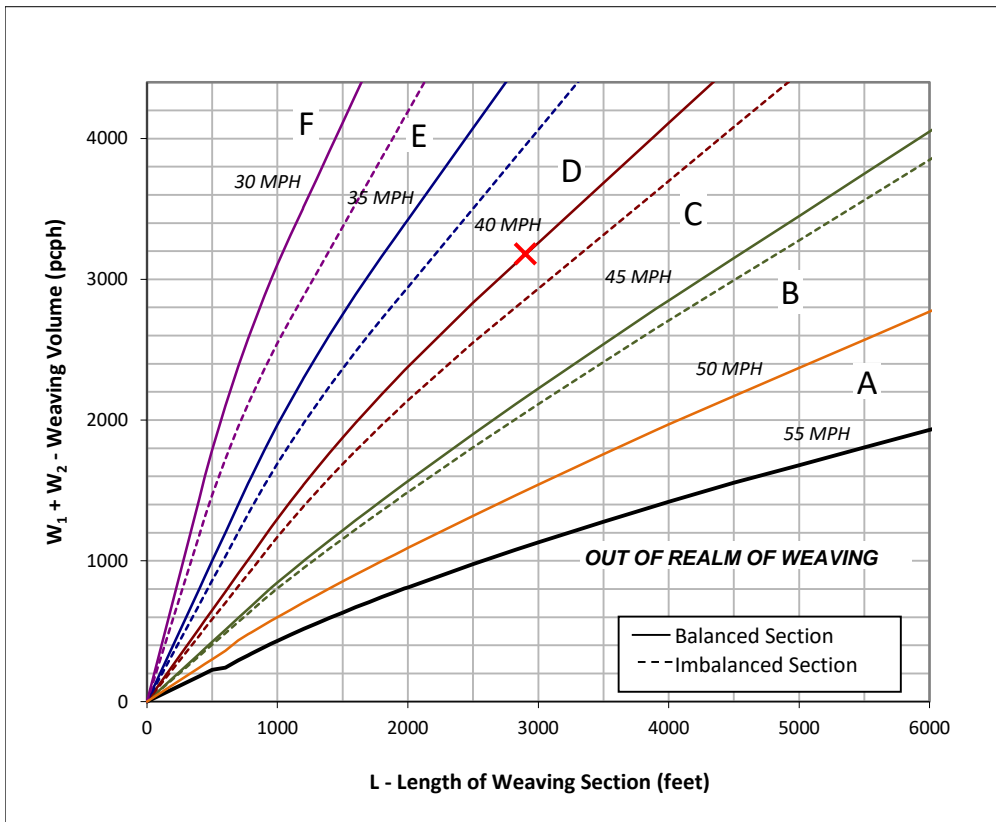
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	5
Length of Weaving Section (feet)	L	2,900

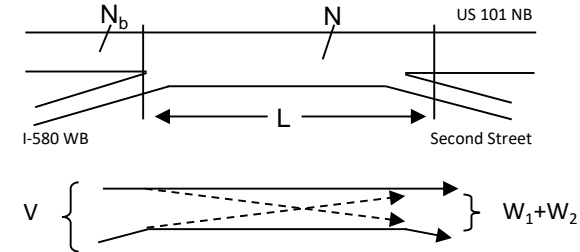
Project Information

Project	BioMarin
Scenario	Cumulative No Project PM Peak Hour
Freeway	US 101 NB
On-ramp	I-580 WB
Off-ramp	Second Street

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	7,250	Volume (vph)*	1,660	Volume (vph)*	1,412
Truck Percentage	4%	Truck Percentage	4%	Truck Percentage	3%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	2.0
Volume (pcph)	7,569	Volume (pcph)	1,733	Volume (pcph)	1,449



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
35 MPH and 40 MPH
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 38.5
- Weaving Intensity Factor (k) 2.62
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,982
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Baseline Conditions
Project Description	BioMarin - US 101 NB Second Street to Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	5170	Heavy Vehicle Adjustment Factor (f _{HV})	0.919
Peak Hour Factor (PHF)	0.98	Flow Rate (v _{p,GP}), pc/h/ln	1913
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c _{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.83
Passenger Car Equivalent (E _T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f _{LW})	-	Average Speed (S), mi/h	58.2
Right-Side Lateral Clearance Adj. (f _{RLC})	-	Density (D _{GP}), pc/mi/ln	32.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS _{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	848	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.99	Flow Rate ($V_{p,ML}$), pc/h/ln	890
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.54
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.7
Speed 2 (S_2), mi/h	0.3	Density (D_{ML}), pc/mi/ln	14.9
Speed 2 (S_3), mi/h	2.1	Level of Service (LOS)	B

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour
Project Description	BioMarin - US 101 NB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	4	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	2.86
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	1.02
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	7460	Heavy Vehicle Adjustment Factor (f _{HV})	0.889
Peak Hour Factor (PHF)	0.98	Flow Rate (v _{p,GP}), pc/h/ln	2141
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c _{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.93
Passenger Car Equivalent (E _T)	3.840		

General Purpose Speed and Density

Lane Width Adjustment (f _{LW})	-	Average Speed (S), mi/h	54.7
Right-Side Lateral Clearance Adj. (f _{RLC})	-	Density (D _{GP}), pc/mi/ln	39.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS _{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	2.86

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1217	Heavy Vehicle Adjustment Factor (f_{HV})	0.916
Peak Hour Factor	0.99	Flow Rate ($V_{p,ML}$), pc/h/ln	1342
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.81
Passenger Car Equivalent (E_T)	5.597		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	1
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	47.9
Speed 2 (S_2), mi/h	2.3	Density (D_{ML}), pc/mi/ln	28.0
Speed 2 (S_3), mi/h	9.8	Level of Service (LOS)	D

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	4/24/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Cumulative No Project Conditions
Project Description	BioMarin - US 101 SB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	-2.44
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	0.77
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	5437	Heavy Vehicle Adjustment Factor (f _{HV})	0.951
Peak Hour Factor (PHF)	0.97	Flow Rate (v _{p,GP}), pc/h/ln	1965
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c _{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.85
Passenger Car Equivalent (E _T)	2.180		

General Purpose Speed and Density

Lane Width Adjustment (f _{LW})	-	Average Speed (S), mi/h	57.6
Right-Side Lateral Clearance Adj. (f _{RLC})	-	Density (D _{GP}), pc/mi/ln	34.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS _{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1377	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1555
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.94
Passenger Car Equivalent (E_T)	2.390		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	56.0
Speed 2 (S_2), mi/h	4.0	Density (D_{ML}), pc/mi/ln	27.8
Speed 2 (S_3), mi/h	15.4	Level of Service (LOS)	D

HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	4/24/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Cumulative No Project Conditions
Project Description	BioMarin - US 101 Mission Ave Slip Off-Ramp		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	3	1
Free-Flow Speed (FFS), mi/h	60.0	50.0
Segment Length (L) / Deceleration Length (L _D), ft	1500	170
Terrain Type	Specific Grade	Specific Grade
Percent Grade, %	-2.44	-1.80
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Volume (V _i), veh/h	5437	2068
Peak Hour Factor (PHF)	0.97	0.96
Total Trucks, %	4.40	2.00
Single-Unit Trucks (SUT), %	66	66
Tractor-Trailers (TT), %	34	34
Heavy Vehicle Adjustment Factor (f _{HV})	0.951	0.973
Flow Rate (v _i), pc/h	5894	2214
Capacity (c), pc/h	6900	2100
Volume-to-Capacity Ratio (v/c)	0.85	1.05

Speed and Density

Upstream Equilibrium Distance (L _{EQ}), ft	148151.7	Density in Ramp Influence Area (D _R), pc/mi/ln	-
Distance to Upstream Ramp (L _{UP}), ft	10000	Speed Index (D _S)	-
Downstream Equilibrium Distance (L _{EQ}), ft	-	Flow Outer Lanes (v _{OA}), pc/h/ln	1800
Distance to Downstream Ramp (L _{DOWN}), ft	10000	Off-Ramp Influence Area Speed (S _R), mi/h	-
Prop. Freeway Vehicles in Lane 1 and 2 (P _{FD})	0.511	Outer Lanes Freeway Speed (S _O), mi/h	62.7
Flow in Lanes 1 and 2 (v ₁₂), pc/h	4094	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (v _{R12}), pc/h	-	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44
Managed Lane Adjustment Factors			
Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V_{ML}), veh/h	1380	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1559
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.94
Passenger Car Equivalent (E_T)	2.390		
Managed Lane Speed and Density			
Breakpoint (BP_{ML})	501	Indicator Variable	1
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	40.4
Speed 2 (S_2), mi/h	4.1	Density (D_{ML}), pc/mi/ln	38.6
Speed 2 (S_3), mi/h	15.5	Level of Service (LOS)	E

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Cumulative No Project Conditions
Project Description	BioMarin - US 101 SB Mission Avenue to Second Street		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	3369	Heavy Vehicle Adjustment Factor (f _{HV})	0.919
Peak Hour Factor (PHF)	0.97	Flow Rate (v _{p,GP}), pc/h/ln	1260
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c _{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.55
Passenger Car Equivalent (E _T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f _{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f _{RLC})	-	Density (D _{GP}), pc/mi/ln	21.0
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS _{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	918	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1049
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.64
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.2
Speed 2 (S_2), mi/h	0.8	Density (D_{ML}), pc/mi/ln	17.7
Speed 2 (S_3), mi/h	4.2	Level of Service (LOS)	B

Leisch Method for Weaving Analysis

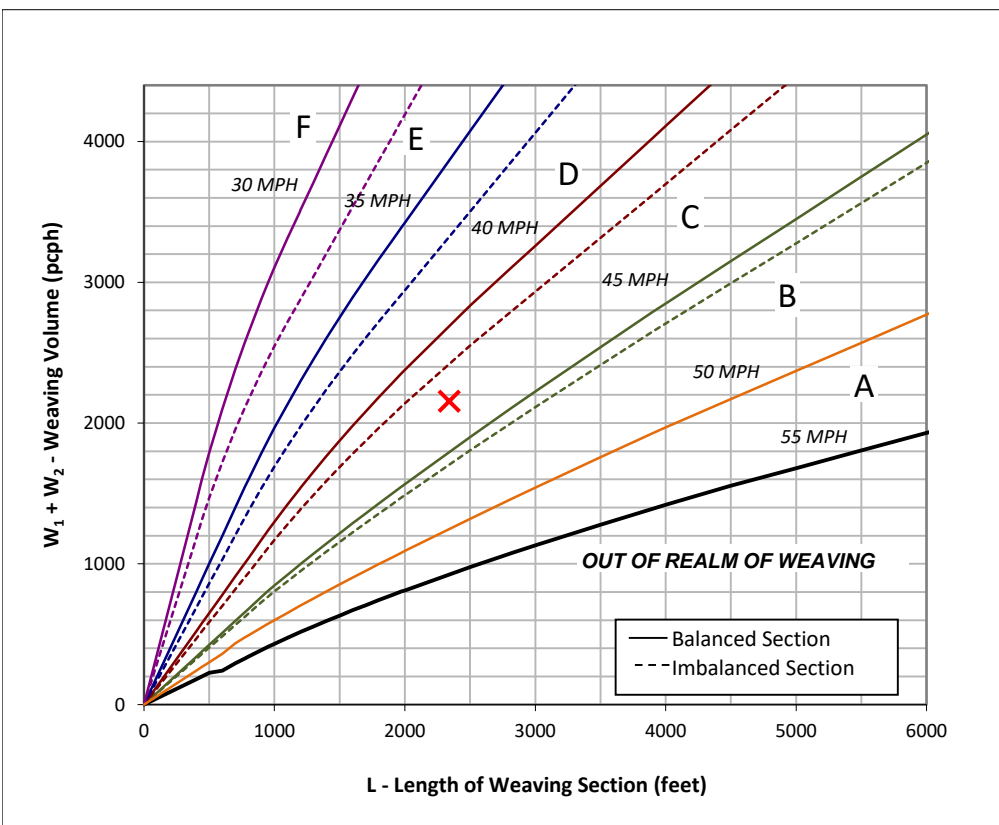
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	2,340

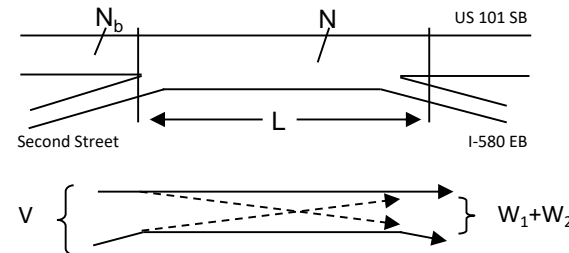
Project Information

Project	BioMarin
Scenario	Cumulative No Project PM Peak Hour
Freeway	US 101 SB
On-ramp	Second Street
Off-ramp	I-580 EB

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	5,358	Volume (vph)*	1,139	Volume (vph)*	901
Truck Percentage	4%	Truck Percentage	3%	Truck Percentage	3%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	4.1
Volume (pcph)	5,594	Volume (pcph)	1,168	Volume (pcph)	989



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
40 MPH and 45 MPH
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 43.0
- Weaving Intensity Factor (k) 2.22
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,701
- Level of Service (LOS) E

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

Appendix F: Cumulative Plus Project Conditions (R&D Only) – Technical Calculations

Transportation Impact Study




















for BioMarin 999 3rd Street

San Rafael Campus Expansion

January 23, 2019

HCM 2010 Signalized Intersection Summary
1: Lincoln & Mission

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	500	20	80	585	50	20	230	90	60	420	380
Future Volume (veh/h)	120	500	20	80	585	50	20	230	90	60	420	380
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	0.99		0.97	0.99		0.94	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1660	1660	1710	1660	1660	1710	1800	1678	1728	1800	1748	1728
Adj Flow Rate, veh/h	130	543	20	87	636	50	22	250	80	65	457	206
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	2	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	148	868	32	341	626	49	68	439	134	136	833	363
Arrive On Green	0.09	0.55	0.55	0.55	0.55	0.55	0.85	0.85	0.85	0.43	0.43	0.43
Sat Flow, veh/h	1581	1588	59	787	1515	119	39	1028	314	188	1952	850
Grp Volume(v), veh/h	130	0	563	87	0	686	352	0	0	395	0	333
Grp Sat Flow(s),veh/h/ln	1581	0	1647	787	0	1634	1381	0	0	1613	0	1376
Q Serve(g_s), s	6.1	0.0	17.7	5.7	0.0	31.0	0.0	0.0	0.0	4.5	0.0	13.8
Cycle Q Clear(g_c), s	6.1	0.0	17.7	13.4	0.0	31.0	5.3	0.0	0.0	13.1	0.0	13.8
Prop In Lane	1.00		0.04	1.00		0.07	0.06		0.23	0.16		0.62
Lane Grp Cap(c), veh/h	148	0	900	341	0	676	640	0	0	744	0	587
V/C Ratio(X)	0.88	0.00	0.63	0.26	0.00	1.02	0.55	0.00	0.00	0.53	0.00	0.57
Avail Cap(c_a), veh/h	148	0	900	341	0	676	640	0	0	744	0	587
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.64	0.00	0.64	0.84	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.6	0.0	11.7	15.5	0.0	16.9	3.5	0.0	0.0	16.0	0.0	16.3
Incr Delay (d2), s/veh	47.7	0.0	3.3	1.1	0.0	31.5	2.8	0.0	0.0	2.7	0.0	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	8.8	1.3	0.0	19.5	2.3	0.0	0.0	6.6	0.0	5.8
LnGrp Delay(d),s/veh	81.3	0.0	15.0	16.7	0.0	48.4	6.4	0.0	0.0	18.7	0.0	20.2
LnGrp LOS	F		B	B		F	A			B		C
Approach Vol, veh/h		693			773			352			728	
Approach Delay, s/veh		27.4			44.8			6.4			19.4	
Approach LOS		C			D			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		45.2		36.8	10.0	35.2		36.8				
Change Period (Y+Rc), s		* 4.2		4.6	3.0	* 4.2		4.6				
Max Green Setting (Gmax), s		* 41		25.4	7.0	* 31		25.4				
Max Q Clear Time (g_c+I1), s		19.7		7.3	8.1	33.0		15.8				
Green Ext Time (p_c), s		5.5		3.1	0.0	0.0		4.4				
Intersection Summary												
HCM 2010 Ctrl Delay			27.5									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis

2: Hetherton & Mission

Cumulative Plus BioMarin Only Conditions

Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑						↑↑	↑
Traffic Volume (vph)	0	515	90	40	230	0	0	0	0	245	1091	500
Future Volume (vph)	0	515	90	40	230	0	0	0	0	245	1091	500
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	10	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		0.95			1.00						0.95	1.00
Frbp, ped/bikes		0.99			1.00						1.00	0.97
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.98			1.00						1.00	0.85
Flt Protected		1.00			0.99						0.99	1.00
Satd. Flow (prot)		2711			1767						2961	1303
Flt Permitted		1.00			0.80						0.99	1.00
Satd. Flow (perm)		2711			1421						2961	1303
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	560	98	43	250	0	0	0	0	266	1186	543
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	639	0	0	293	0	0	0	0	0	1452	543
Confl. Peds. (#/hr)	15		22	22		15			16			1
Confl. Bikes (#/hr)			3			2			1			3
Turn Type		NA		Perm	NA					Split	NA	custom
Protected Phases		4			8					2	2	
Permitted Phases				8								5
Actuated Green, G (s)		23.8			23.8						42.4	35.4
Effective Green, g (s)		23.8			23.8						42.4	35.4
Actuated g/C Ratio		0.32			0.32						0.57	0.47
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		860			450						1673	615
v/s Ratio Prot		c0.24									c0.49	
v/s Ratio Perm					0.21							0.42
v/c Ratio		0.74			0.65						0.87	0.88
Uniform Delay, d1		22.9			22.0						13.9	17.9
Progression Factor		0.74			1.33						1.00	1.00
Incremental Delay, d2		4.8			5.6						6.4	16.7
Delay (s)		21.8			34.9						20.3	34.7
Level of Service		C			C						C	C
Approach Delay (s)		21.8			34.9			0.0			24.2	
Approach LOS		C			C			A			C	

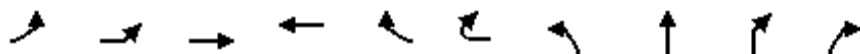
Intersection Summary

HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

3: Irwin & Mission



















Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour



Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2	
Lane Configurations		↔	↑	↑	↔			↕	↔		
Traffic Volume (vph)	400	30	330	170	340	10	110	1146	140	40	
Future Volume (vph)	400	30	330	170	340	10	110	1146	140	40	
Ideal Flow (vphpl)	2200	1800	2200	2200	2200	1800	2200	2200	1800	2200	
Lane Width	9	12	10	10	9	12	12	12	12	12	
Total Lost time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Lane Util. Factor		1.00	1.00	1.00	1.00			0.95	1.00		
Frbp, ped/bikes		1.00	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		
Frt		1.00	1.00	1.00	0.85			1.00	0.85		
Flt Protected		0.95	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (prot)		1494	1794	1615	1471			3430	1294		
Flt Permitted		0.58	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (perm)		919	1794	1615	1471			3430	1294		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	435	33	359	185	370	11	120	1246	152	43	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	46	0	
Lane Group Flow (vph)	0	468	359	185	381	0	0	1366	149	0	
Confl. Peds. (#/hr)							13			6	
Confl. Bikes (#/hr)					2	2				2	
Parking (#/hr)				0				2			
Turn Type	pm+pt	pm+pt	NA	NA	Prot		Perm	NA	Perm		
Protected Phases	5	5	2	6	6			4			
Permitted Phases	2	2					4			4	
Actuated Green, G (s)		34.8	34.8	19.8	19.8			31.8	31.8		
Effective Green, g (s)		34.8	34.8	19.8	19.8			31.8	31.8		
Actuated g/C Ratio		0.46	0.46	0.26	0.26			0.42	0.42		
Clearance Time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0		
Lane Grp Cap (vph)		509	832	426	388			1454	548		
v/s Ratio Prot		c0.13	0.20	0.11	0.26						
v/s Ratio Perm		c0.29						0.40	0.12		
v/c Ratio		0.92	0.43	0.43	0.98			0.94	0.27		
Uniform Delay, d1		19.1	13.5	22.9	27.4			20.7	14.1		
Progression Factor		0.91	0.80	1.00	1.00			0.75	0.71		
Incremental Delay, d2		14.6	0.2	0.7	40.7			6.0	0.5		
Delay (s)		32.0	11.0	23.7	68.1			21.5	10.5		
Level of Service		C	B	C	E			C	B		
Approach Delay (s)			22.9	53.6				20.1			
Approach LOS			C	D				C			
Intersection Summary											
HCM 2000 Control Delay			27.3							HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.98								
Actuated Cycle Length (s)			75.0							Sum of lost time (s)	12.6
Intersection Capacity Utilization			94.0%							ICU Level of Service	F
Analysis Period (min)			15								
c	Critical Lane Group										

HCM 2010 Signalized Intersection Summary
4: Lincoln & 5th

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	320	40	70	290	70	20	240	70	50	420	50
Future Volume (veh/h)	40	320	40	70	290	70	20	240	70	50	420	50
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	0.99		0.95	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1398	1545	1530	1398	1485	1530	1440	1485	1469	1440	1485	1469
Adj Flow Rate, veh/h	43	348	36	76	315	63	22	261	62	54	457	49
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	126	409	42	143	356	71	72	563	128	97	612	63
Arrive On Green	0.30	0.30	0.30	0.10	0.10	0.10	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	792	1370	142	785	1193	239	37	973	221	76	1057	109
Grp Volume(v), veh/h	43	0	384	76	0	378	345	0	0	560	0	0
Grp Sat Flow(s),veh/h/ln	792	0	1512	785	0	1432	1231	0	0	1242	0	0
Q Serve(g_s), s	2.9	0.0	17.9	4.5	0.0	19.5	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	22.4	0.0	17.9	22.4	0.0	19.5	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.09	1.00		0.17	0.06		0.18	0.10		0.09
Lane Grp Cap(c), veh/h	126	0	452	143	0	428	763	0	0	771	0	0
V/C Ratio(X)	0.34	0.00	0.85	0.53	0.00	0.88	0.45	0.00	0.00	0.73	0.00	0.00
Avail Cap(c_a), veh/h	126	0	452	143	0	428	763	0	0	771	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.94	0.00	0.94	0.86	0.00	0.00	0.38	0.00	0.00
Uniform Delay (d), s/veh	36.5	0.0	24.7	43.6	0.0	32.5	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	7.2	0.0	17.9	12.7	0.0	21.4	1.7	0.0	0.0	2.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	9.7	2.1	0.0	10.3	0.4	0.0	0.0	0.5	0.0	0.0
LnGrp Delay(d),s/veh	43.7	0.0	42.6	56.3	0.0	54.0	1.7	0.0	0.0	2.3	0.0	0.0
LnGrp LOS	D		D	E		D	A			A		
Approach Vol, veh/h		427			454			345			560	
Approach Delay, s/veh		42.7			54.3			1.7			2.3	
Approach LOS		D			D			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		27.0		48.0		27.0		48.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		22.4		43.4		22.4		43.4				
Max Q Clear Time (g_c+I1), s		24.4		2.0		24.4		2.0				
Green Ext Time (p_c), s		0.0		1.7		0.0		3.0				
Intersection Summary												
HCM 2010 Ctrl Delay			25.1									
HCM 2010 LOS			C									

HCM Signalized Intersection Capacity Analysis

5: Hetherton & 5th

Cumulative Plus BioMarin Only Conditions


















Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔					↔↔↔	↔↔↔	↔
Traffic Volume (vph)	0	260	180	40	245	0	0	0	0	50	1046	125
Future Volume (vph)	0	260	180	40	245	0	0	0	0	50	1046	125
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		1.00			1.00						0.91	1.00
Frbp, ped/bikes		0.99			1.00						1.00	0.95
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.94			1.00						1.00	0.85
Flt Protected		1.00			0.99						1.00	1.00
Satd. Flow (prot)		1665			1769						4119	1127
Flt Permitted		1.00			0.90						1.00	1.00
Satd. Flow (perm)		1665			1604						4119	1127
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	283	196	43	266	0	0	0	0	54	1137	136
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	468	0	0	309	0	0	0	0	0	1191	136
Confl. Peds. (#/hr)			15	15		14			22	22		10
Confl. Bikes (#/hr)			4			2			2			2
Parking (#/hr)											2	2
Turn Type		NA		Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases				8						2		5
Actuated Green, G (s)		35.8			35.8						30.4	23.4
Effective Green, g (s)		35.8			35.8						30.4	23.4
Actuated g/C Ratio		0.48			0.48						0.41	0.31
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		794			765						1669	351
v/s Ratio Prot		c0.28										
v/s Ratio Perm					0.19						0.29	0.12
v/c Ratio		0.59			0.40						0.71	0.39
Uniform Delay, d1		14.2			12.7						18.7	20.2
Progression Factor		0.45			1.32						0.61	0.69
Incremental Delay, d2		3.0			0.9						1.3	1.6
Delay (s)		9.5			17.6						12.6	15.4
Level of Service		A			B						B	B
Approach Delay (s)		9.5			17.6			0.0			12.9	
Approach LOS		A			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			12.8								B	
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			75.0							10.8		
Intersection Capacity Utilization			86.7%								E	
Analysis Period (min)			15									
c Critical Lane Group												



















HCM 2010 Signalized Intersection Summary
6: Irwin & 5th

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	110	0	0	160	130	150	1186	20	0	0	0
Future Volume (veh/h)	150	110	0	0	160	130	150	1186	20	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.89	0.89	1.00	0.89			
Adj Sat Flow, veh/h/ln	1573	1573	0	0	1573	1620	1620	1573	1620			
Adj Flow Rate, veh/h	163	120	0	0	174	103	163	1289	21			
Adj No. of Lanes	1	1	0	0	1	0	0	2	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	0	3	0			
Cap, veh/h	218	491	0	0	254	151	166	1381	24			
Arrive On Green	0.10	0.10	0.00	0.00	0.31	0.31	0.19	0.19	0.19			
Sat Flow, veh/h	976	1573	0	0	816	483	293	2442	42			
Grp Volume(v), veh/h	163	120	0	0	0	277	770	0	703			
Grp Sat Flow(s),veh/h/ln	976	1573	0	0	0	1299	1385	0	1392			
Q Serve(g_s), s	9.4	5.3	0.0	0.0	0.0	14.0	41.5	0.0	37.0			
Cycle Q Clear(g_c), s	23.4	5.3	0.0	0.0	0.0	14.0	41.5	0.0	37.0			
Prop In Lane	1.00		0.00	0.00		0.37	0.21		0.03			
Lane Grp Cap(c), veh/h	218	491	0	0	0	405	783	0	787			
V/C Ratio(X)	0.75	0.24	0.00	0.00	0.00	0.68	0.98	0.00	0.89			
Avail Cap(c_a), veh/h	218	491	0	0	0	405	783	0	787			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)	0.77	0.77	0.00	0.00	0.00	1.00	0.09	0.00	0.09			
Uniform Delay (d), s/veh	41.8	25.5	0.0	0.0	0.0	22.6	30.1	0.0	28.3			
Incr Delay (d2), s/veh	10.4	0.2	0.0	0.0	0.0	4.7	6.5	0.0	1.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.0	2.3	0.0	0.0	0.0	5.5	17.3	0.0	14.6			
LnGrp Delay(d),s/veh	52.2	25.7	0.0	0.0	0.0	27.3	36.6	0.0	30.0			
LnGrp LOS	D	C				C	D		C			
Approach Vol, veh/h		283			277			1473				
Approach Delay, s/veh		41.0			27.3			33.5				
Approach LOS		D			C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		28.0		47.0		28.0						
Change Period (Y+Rc), s		4.6		4.6		4.6						
Max Green Setting (Gmax), s		23.4		42.4		23.4						
Max Q Clear Time (g_c+I1), s		25.4		43.5		16.0						
Green Ext Time (p_c), s		0.0		0.0		0.7						
Intersection Summary												
HCM 2010 Ctrl Delay				33.7								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary
7: Lincoln & 4th

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	265	20	80	340	60	20	240	70	85	370	80
Future Volume (veh/h)	40	265	20	80	340	60	20	240	70	85	370	80
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.90	0.97		0.91	0.97		0.92	0.99		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1573	1510	1620	1573	1573	1620	1620	1573	1555	1620	1573	1555
Adj Flow Rate, veh/h	43	288	19	87	370	56	22	261	62	92	402	78
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	117	423	28	209	400	60	74	598	136	144	541	99
Arrive On Green	0.30	0.30	0.30	0.10	0.10	0.10	0.19	0.19	0.19	1.00	1.00	1.00
Sat Flow, veh/h	853	1390	92	925	1314	199	39	1024	233	151	926	170
Grp Volume(v), veh/h	43	0	307	87	0	426	345	0	0	572	0	0
Grp Sat Flow(s),veh/h/ln	853	0	1482	925	0	1513	1296	0	0	1248	0	0
Q Serve(g_s), s	1.9	0.0	13.6	7.0	0.0	20.9	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	22.8	0.0	13.6	20.6	0.0	20.9	17.1	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.13	0.06		0.18	0.16		0.14
Lane Grp Cap(c), veh/h	117	0	450	209	0	460	808	0	0	784	0	0
V/C Ratio(X)	0.37	0.00	0.68	0.42	0.00	0.93	0.43	0.00	0.00	0.73	0.00	0.00
Avail Cap(c_a), veh/h	117	0	450	209	0	460	808	0	0	784	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.92	0.00	0.92	0.76	0.00	0.00	0.48	0.00	0.00
Uniform Delay (d), s/veh	37.0	0.0	22.9	39.5	0.0	32.9	19.5	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	8.7	0.0	8.1	5.5	0.0	25.5	1.3	0.0	0.0	2.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	6.6	2.1	0.0	12.1	6.6	0.0	0.0	0.6	0.0	0.0
LnGrp Delay(d),s/veh	45.7	0.0	31.0	45.1	0.0	58.4	20.8	0.0	0.0	2.9	0.0	0.0
LnGrp LOS	D		C	D		E	C			A		
Approach Vol, veh/h		350			513			345			572	
Approach Delay, s/veh		32.8			56.1			20.8			2.9	
Approach LOS		C			E			C			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		27.0		48.0		27.0		48.0				
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2		* 4.2				
Max Green Setting (Gmax), s		* 23		* 44		* 23		* 44				
Max Q Clear Time (g_c+I1), s		24.8		19.1		22.9		2.0				
Green Ext Time (p_c), s		0.0		3.3		0.0		7.3				
Intersection Summary												
HCM 2010 Ctrl Delay				27.6								
HCM 2010 LOS				C								
Notes												

HCM Signalized Intersection Capacity Analysis
8: 4th & Tamalpais

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↗
Traffic Volume (vph)	0	500	430	0	0	55
Future Volume (vph)	0	500	430	0	0	55
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.6	5.6			5.2
Lane Util. Factor		1.00	1.00			1.00
Frbp, ped/bikes		1.00	1.00			0.87
Flpb, ped/bikes		1.00	1.00			1.00
Frt		1.00	1.00			0.86
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		1573	1573			1188
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		1573	1573			1188
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	543	467	0	0	60
RTOR Reduction (vph)	0	0	0	0	0	49
Lane Group Flow (vph)	0	543	467	0	0	11
Confl. Peds. (#/hr)				39		46
Confl. Bikes (#/hr)				4		
Turn Type		NA	NA			Perm
Protected Phases		2 8	4 6			
Permitted Phases						8
Actuated Green, G (s)		50.3	50.4			13.8
Effective Green, g (s)		50.3	50.4			13.8
Actuated g/C Ratio		0.67	0.67			0.18
Clearance Time (s)						5.2
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)		1054	1057			218
v/s Ratio Prot		c0.35	c0.30			
v/s Ratio Perm						0.01
v/c Ratio		0.52	0.44			0.05
Uniform Delay, d1		6.2	5.7			25.2
Progression Factor		1.32	0.48			1.00
Incremental Delay, d2		0.3	0.2			0.1
Delay (s)		8.6	2.9			25.3
Level of Service		A	A			C
Approach Delay (s)		8.6	2.9		25.3	
Approach LOS		A	A		C	
Intersection Summary						
HCM 2000 Control Delay			7.0		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.57			
Actuated Cycle Length (s)			75.0		Sum of lost time (s)	16.4
Intersection Capacity Utilization			97.1%		ICU Level of Service	F
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
9: Hetherton & 4th

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour




















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↘	↑						↑↑↑	↗
Traffic Volume (vph)	0	305	200	200	305	0	0	0	0	110	966	190
Future Volume (vph)	0	305	200	200	305	0	0	0	0	110	966	190
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	13	10	15	11	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Lane Util. Factor		1.00	1.00	1.00	1.00						0.91	1.00
Frbp, ped/bikes		1.00	0.95	1.00	1.00						1.00	0.89
Flpb, ped/bikes		1.00	1.00	0.98	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						0.99	1.00
Satd. Flow (prot)		1625	1181	1607	1520						4264	1184
Flt Permitted		1.00	1.00	0.49	1.00						0.99	1.00
Satd. Flow (perm)		1625	1181	824	1520						4264	1184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	332	217	217	332	0	0	0	0	120	1050	207
RTOR Reduction (vph)	0	0	27	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	332	190	217	332	0	0	0	0	0	1170	207
Confl. Peds. (#/hr)			40	40		22			9	9		30
Confl. Bikes (#/hr)			8			4						2
Turn Type		NA	Perm	Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases			4	8						2		5
Actuated Green, G (s)		35.8	35.8	35.8	35.8						30.4	23.4
Effective Green, g (s)		35.8	35.8	35.8	35.8						30.4	23.4
Actuated g/C Ratio		0.48	0.48	0.48	0.48						0.41	0.31
Clearance Time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		775	563	393	725						1728	369
v/s Ratio Prot		0.20			0.22							
v/s Ratio Perm			0.16	0.26							0.27	0.17
v/c Ratio		0.43	0.34	0.55	0.46						0.68	0.56
Uniform Delay, d1		12.9	12.2	13.9	13.1						18.3	21.5
Progression Factor		0.49	0.42	1.03	1.07						0.32	0.42
Incremental Delay, d2		1.5	1.4	3.8	1.4						1.5	4.4
Delay (s)		7.8	6.6	18.2	15.4						7.4	13.4
Level of Service		A	A	B	B						A	B
Approach Delay (s)		7.3			16.5			0.0			8.3	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			















HCM 2010 Signalized Intersection Summary
10: Irwin & 4th

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	240	0	0	380	70	130	1146	50	0	0	0
Future Volume (veh/h)	170	240	0	0	380	70	130	1146	50	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.96	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89			
Adj Sat Flow, veh/h/ln	1573	1573	0	0	1573	1620	1510	1573	1620			
Adj Flow Rate, veh/h	185	261	0	0	413	66	141	1246	50			
Adj No. of Lanes	1	1	0	0	1	0	1	2	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	137	625	0	0	465	74	706	1356	54			
Arrive On Green	0.79	0.79	0.00	0.00	0.13	0.13	0.16	0.16	0.16			
Sat Flow, veh/h	813	1573	0	0	1170	187	1438	2763	111			
Grp Volume(v), veh/h	185	261	0	0	0	479	141	673	623			
Grp Sat Flow(s),veh/h/ln	813	1573	0	0	0	1357	1438	1494	1379			
Q Serve(g_s), s	3.8	3.8	0.0	0.0	0.0	26.0	6.4	33.3	33.3			
Cycle Q Clear(g_c), s	29.8	3.8	0.0	0.0	0.0	26.0	6.4	33.3	33.3			
Prop In Lane	1.00		0.00	0.00		0.14	1.00		0.08			
Lane Grp Cap(c), veh/h	137	625	0	0	0	539	706	733	677			
V/C Ratio(X)	1.35	0.42	0.00	0.00	0.00	0.89	0.20	0.92	0.92			
Avail Cap(c_a), veh/h	137	625	0	0	0	539	706	733	677			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33			
Upstream Filter(I)	0.91	0.91	0.00	0.00	0.00	1.00	0.17	0.17	0.17			
Uniform Delay (d), s/veh	22.0	5.0	0.0	0.0	0.0	31.0	18.7	30.0	30.0			
Incr Delay (d2), s/veh	196.0	1.9	0.0	0.0	0.0	19.3	0.1	4.3	4.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	10.2	1.8	0.0	0.0	0.0	12.7	2.6	14.7	13.6			
LnGrp Delay(d),s/veh	218.1	6.9	0.0	0.0	0.0	50.2	18.8	34.2	34.7			
LnGrp LOS	F	A				D	B	C	C			
Approach Vol, veh/h		446			479			1437				
Approach Delay, s/veh		94.5			50.2			32.9				
Approach LOS		F			D			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		34.0		41.0		34.0						
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2						
Max Green Setting (Gmax), s		* 30		* 37		* 30						
Max Q Clear Time (g_c+I1), s		31.8		35.3		28.0						
Green Ext Time (p_c), s		0.0		1.0		0.4						
Intersection Summary												
HCM 2010 Ctrl Delay			48.0									
HCM 2010 LOS			D									
Notes												













HCM 2010 Signalized Intersection Summary
11: D & 3rd

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	320	1221	0	0	0	0	0	240	30
Future Volume (veh/h)	0	0	0	320	1221	0	0	0	0	0	240	30
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1530	1485	0				0	1485	1530
Adj Flow Rate, veh/h				348	1327	0				0	261	17
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				586	2028	0				0	525	34
Arrive On Green				0.22	0.22	0.00				0.00	0.21	0.21
Sat Flow, veh/h				755	3124	0				0	2611	164
Grp Volume(v), veh/h				598	1077	0				0	144	134
Grp Sat Flow(s),veh/h/ln				1297	1230	0				0	1411	1290
Q Serve(g_s), s				31.7	29.8	0.0				0.0	6.8	6.9
Cycle Q Clear(g_c), s				31.7	29.8	0.0				0.0	6.8	6.9
Prop In Lane				0.58		0.00				0.00		0.13
Lane Grp Cap(c), veh/h				952	1662	0				0	292	267
V/C Ratio(X)				0.63	0.65	0.00				0.00	0.49	0.50
Avail Cap(c_a), veh/h				952	1662	0				0	440	402
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				0.68	0.68	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				21.8	21.0	0.0				0.0	26.3	26.3
Incr Delay (d2), s/veh				2.1	1.3	0.0				0.0	1.3	1.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				12.0	10.5	0.0				0.0	2.8	2.6
LnGrp Delay(d),s/veh				23.9	22.4	0.0				0.0	27.6	27.8
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1675						278	
Approach Delay, s/veh					22.9						27.6	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		54.9		20.1								
Change Period (Y+Rc), s		* 4.2		4.6								
Max Green Setting (Gmax), s		* 43		23.4								
Max Q Clear Time (g_c+I1), s		33.7		8.9								
Green Ext Time (p_c), s		5.6		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay				23.6								
HCM 2010 LOS				C								
Notes												


















HCM 2010 Signalized Intersection Summary
12: C & 3rd

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↗		↖				
Traffic Volume (veh/h)	0	0	0	0	1416	120	110	250	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1416	120	110	250	0	0	0	0
Number				5	2	12	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.98	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1398	1398	1440	1398	0			
Adj Flow Rate, veh/h				0	1539	97	120	272	0			
Adj No. of Lanes				0	3	1	0	2	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	3	3	3	3	0			
Cap, veh/h				0	2536	774	218	404	0			
Arrive On Green				0.00	0.22	0.22	0.07	0.07	0.00			
Sat Flow, veh/h				0	3943	1164	640	1870	0			
Grp Volume(v), veh/h				0	1539	97	216	176	0			
Grp Sat Flow(s),veh/h/ln				0	1272	1164	1238	1209	0			
Q Serve(g_s), s				0.0	27.2	5.0	11.7	10.7	0.0			
Cycle Q Clear(g_c), s				0.0	27.2	5.0	12.8	10.7	0.0			
Prop In Lane				0.00		1.00	0.56		0.00			
Lane Grp Cap(c), veh/h				0	2536	774	351	270	0			
V/C Ratio(X)				0.00	0.61	0.13	0.61	0.65	0.00			
Avail Cap(c_a), veh/h				0	2536	774	421	338	0			
HCM Platoon Ratio				1.00	0.33	0.33	0.33	0.33	1.00			
Upstream Filter(I)				0.00	0.57	0.57	0.79	0.79	0.00			
Uniform Delay (d), s/veh				0.0	20.5	11.8	32.8	31.9	0.0			
Incr Delay (d2), s/veh				0.0	0.6	0.2	1.5	2.5	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	9.8	1.7	4.6	3.7	0.0			
LnGrp Delay(d),s/veh				0.0	21.1	12.0	34.3	34.4	0.0			
LnGrp LOS					C	B	C	C				
Approach Vol, veh/h					1636			392				
Approach Delay, s/veh					20.5			34.3				
Approach LOS					C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		54.0		21.0								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 46		* 21								
Max Q Clear Time (g_c+I1), s		29.2		14.8								
Green Ext Time (p_c), s		8.4		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay				23.2								
HCM 2010 LOS				C								
Notes												

















HCM 2010 Signalized Intersection Summary
13: B & 3rd

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  						 	
Traffic Volume (veh/h)	0	0	0	90	1471	0	0	0	0	0	200	60
Future Volume (veh/h)	0	0	0	90	1471	0	0	0	0	0	200	60
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.86
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1440	1398	0				0	1398	1440
Adj Flow Rate, veh/h				98	1599	0				0	217	45
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				165	2266	0				0	486	97
Arrive On Green				0.21	0.21	0.00				0.00	0.24	0.24
Sat Flow, veh/h				170	3616	0				0	2091	401
Grp Volume(v), veh/h				631	1066	0				0	139	123
Grp Sat Flow(s),veh/h/ln				1356	1158	0				0	1328	1094
Q Serve(g_s), s				23.1	32.0	0.0				0.0	6.7	7.2
Cycle Q Clear(g_c), s				32.3	32.0	0.0				0.0	6.7	7.2
Prop In Lane				0.16		0.00				0.00		0.37
Lane Grp Cap(c), veh/h				933	1499	0				0	320	263
V/C Ratio(X)				0.68	0.71	0.00				0.00	0.44	0.47
Avail Cap(c_a), veh/h				933	1499	0				0	411	338
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				0.69	0.69	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				23.0	23.0	0.0				0.0	24.2	24.3
Incr Delay (d2), s/veh				2.7	2.0	0.0				0.0	0.9	1.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				12.9	10.7	0.0				0.0	2.5	2.3
LnGrp Delay(d),s/veh				25.7	25.0	0.0				0.0	25.1	25.6
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1697						262	
Approach Delay, s/veh					25.3						25.3	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		52.7		22.3								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 43		* 23								
Max Q Clear Time (g_c+I1), s		34.3		9.2								
Green Ext Time (p_c), s		5.6		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay				25.3								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary
14: A & 3rd

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	40	1311	80	210	135	0	0	140	30
Future Volume (veh/h)	0	0	0	40	1311	80	210	135	0	0	140	30
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	0.96		1.00	1.00		0.92
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1800	1748	1800	1835	1835	0	0	1835	1890
Adj Flow Rate, veh/h				43	1425	78	228	147	0	0	152	21
Adj No. of Lanes				0	3	0	1	1	0	0	1	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	3	0	3	3	0	0	3	3
Cap, veh/h				73	2568	145	303	606	0	0	302	42
Arrive On Green				0.56	0.56	0.56	0.02	0.11	0.00	0.00	0.22	0.22
Sat Flow, veh/h				131	4617	261	1748	1835	0	0	1389	192
Grp Volume(v), veh/h				571	474	501	228	147	0	0	0	173
Grp Sat Flow(s),veh/h/ln				1741	1590	1679	1748	1835	0	0	0	1581
Q Serve(g_s), s				16.2	14.2	14.2	0.6	5.5	0.0	0.0	0.0	7.2
Cycle Q Clear(g_c), s				16.2	14.2	14.2	0.6	5.5	0.0	0.0	0.0	7.2
Prop In Lane				0.08		0.16	1.00		0.00	0.00		0.12
Lane Grp Cap(c), veh/h				968	885	934	303	606	0	0	0	344
V/C Ratio(X)				0.59	0.54	0.54	0.75	0.24	0.00	0.00	0.00	0.50
Avail Cap(c_a), veh/h				968	885	934	443	807	0	0	0	390
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	0.84	0.84	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				11.0	10.5	10.5	33.1	24.8	0.0	0.0	0.0	25.8
Incr Delay (d2), s/veh				2.6	2.3	2.2	6.8	0.4	0.0	0.0	0.0	2.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				8.5	6.8	7.1	5.2	2.9	0.0	0.0	0.0	3.4
LnGrp Delay(d),s/veh				13.6	12.9	12.7	40.0	25.2	0.0	0.0	0.0	28.2
LnGrp LOS				B	B	B	D	C				C
Approach Vol, veh/h					1546			375			173	
Approach Delay, s/veh					13.1			34.2			28.2	
Approach LOS					B			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			8.0	20.8		46.2		28.8				
Change Period (Y+Rc), s			4.0	4.5		4.5		4.0				
Max Green Setting (Gmax), s			10.0	18.5		33.5		33.0				
Max Q Clear Time (g_c+I1), s			2.6	9.2		18.2		7.5				
Green Ext Time (p_c), s			1.0	0.8		11.2		1.1				
Intersection Summary												
HCM 2010 Ctrl Delay				18.1								
HCM 2010 LOS				B								

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

BioMarin
Cumulative + BioMarin Only Conditions
AM Peak Hour

Intersection 15 Brooks St/3rd St Side-street Stop
















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	20	22	108.6%	6.4	2.1	A
	Through	5	4	81.0%	13.4	11.6	B
	Right Turn						
	Subtotal	25	26	103.0%	8.3	3.3	A
SB	Left Turn						
	Through	5	5	103.0%	27.0	18.0	D
	Right Turn	10	12	117.8%	14.0	9.6	B
	Subtotal	15	17	112.9%	20.4	7.4	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	30	24	78.5%	2.4	0.3	A
	Through	1,401	1,328	94.8%	1.8	0.3	A
	Right Turn	10	11	114.1%	1.3	0.4	A
	Subtotal	1,441	1,363	94.6%	1.8	0.3	A
Total		1,481	1,406	94.9%	2.1	0.3	A

Intersection 16 Lindaro St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	83	79	95.3%	25.7	7.2	C
	Through	10	9	88.3%	19.8	18.6	B
	Right Turn						
	Subtotal	93	88	94.6%	24.9	6.2	C
SB	Left Turn						
	Through	40	39	98.4%	45.4	12.1	D
	Right Turn	10	8	84.6%	15.9	10.2	B
	Subtotal	50	48	95.7%	40.9	10.4	D
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	477	432	90.6%	22.0	6.2	C
	Through	1,378	1,305	94.7%	7.1	1.4	A
	Right Turn	30	26	87.1%	5.8	2.0	A
	Subtotal	1,885	1,763	93.6%	10.8	2.6	B
Total		2,028	1,899	93.7%	12.2	2.7	B
















HCM 2010 Signalized Intersection Summary
17: Lincoln & 3rd

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	175	1759	75	41	195	0	0	290	165
Future Volume (veh/h)	0	0	0	175	1759	75	41	195	0	0	290	165
Number				1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.91	1.00		1.00	1.00		0.92
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Adj Sat Flow, veh/h/ln				1620	1573	1620	1620	1573	0	0	1510	1555
Adj Flow Rate, veh/h				190	1912	77	45	212	0	0	315	177
Adj No. of Lanes				0	3	0	0	1	0	0	1	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	3	0	3	3	0	0	3	3
Cap, veh/h				175	1882	78	57	189	0	0	316	178
Arrive On Green				0.16	0.16	0.16	0.13	0.13	0.00	0.00	0.13	0.13
Sat Flow, veh/h				370	3976	164	1	466	0	0	778	437
Grp Volume(v), veh/h				797	666	715	257	0	0	0	0	492
Grp Sat Flow(s),veh/h/ln				1554	1431	1525	467	0	0	0	0	1215
Q Serve(g_s), s				35.5	34.8	35.1	0.2	0.0	0.0	0.0	0.0	30.3
Cycle Q Clear(g_c), s				35.5	34.8	35.1	30.5	0.0	0.0	0.0	0.0	30.3
Prop In Lane				0.24		0.11	0.18		0.00	0.00		0.36
Lane Grp Cap(c), veh/h				736	677	722	246	0	0	0	0	494
V/C Ratio(X)				1.08	0.98	0.99	1.04	0.00	0.00	0.00	0.00	1.00
Avail Cap(c_a), veh/h				736	677	722	246	0	0	0	0	494
HCM Platoon Ratio				0.33	0.33	0.33	0.33	0.33	1.00	1.00	0.33	0.33
Upstream Filter(I)				0.26	0.26	0.26	1.00	0.00	0.00	0.00	0.00	0.44
Uniform Delay (d), s/veh				31.6	31.4	31.5	27.9	0.0	0.0	0.0	0.0	32.4
Incr Delay (d2), s/veh				44.7	13.9	14.9	69.3	0.0	0.0	0.0	0.0	25.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				24.4	16.4	17.8	9.8	0.0	0.0	0.0	0.0	13.7
LnGrp Delay(d),s/veh				76.3	45.2	46.4	97.2	0.0	0.0	0.0	0.0	58.2
LnGrp LOS				F	D	D	F					E
Approach Vol, veh/h					2179			257			492	
Approach Delay, s/veh					57.0			97.2			58.2	
Approach LOS					E			F			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				35.0		40.0		35.0				
Change Period (Y+Rc), s				4.5		4.5		4.5				
Max Green Setting (Gmax), s				30.5		35.5		30.5				
Max Q Clear Time (g_c+I1), s				32.5		37.5		32.3				
Green Ext Time (p_c), s				0.0		0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				60.7								
HCM 2010 LOS				E								

HCM Signalized Intersection Capacity Analysis
18: Tamalpais & 3rd


















Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	295	1944	30	50	50	0	0	0	0
Future Volume (vph)	0	0	0	295	1944	30	50	50	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1600	1600	1600	1600	1600	1800	1800	1600	1600
Lane Width	12	12	12	12	12	12	11	12	12	12	12	12
Total Lost time (s)					11.6		7.6	7.6				
Lane Util. Factor					0.91		1.00	1.00				
Frbp, ped/bikes					1.00		1.00	1.00				
Flpb, ped/bikes					0.98		0.93	1.00				
Frt					1.00		1.00	1.00				
Flt Protected					0.99		0.95	1.00				
Satd. Flow (prot)					3698		1057	1237				
Flt Permitted					0.99		0.95	1.00				
Satd. Flow (perm)					3698		1057	1237				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	321	2113	33	54	54	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	2465	0	54	54	0	0	0	0
Confl. Peds. (#/hr)			73	73		38	49		63			49
Confl. Bikes (#/hr)						2			2			2
Parking (#/hr)							3	3			3	3
Turn Type				Perm	NA		Perm	NA				
Protected Phases					6			4				
Permitted Phases				6			4					
Actuated Green, G (s)					51.8		19.0	19.0				
Effective Green, g (s)					51.8		19.0	19.0				
Actuated g/C Ratio					0.58		0.21	0.21				
Clearance Time (s)					11.6		7.6	7.6				
Vehicle Extension (s)					5.0		5.0	5.0				
Lane Grp Cap (vph)					2128		223	261				
v/s Ratio Prot								0.04				
v/s Ratio Perm					0.67		c0.05					
v/c Ratio					1.16		0.24	0.21				
Uniform Delay, d1					19.1		29.5	29.3				
Progression Factor					1.00		1.00	1.00				
Incremental Delay, d2					77.1		1.2	0.8				
Delay (s)					96.2		30.7	30.1				
Level of Service					F		C	C				
Approach Delay (s)		0.0			96.2			30.4			0.0	
Approach LOS		A			F			C			A	
Intersection Summary												
HCM 2000 Control Delay			93.4		HCM 2000 Level of Service				F			
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)				19.2			
Intersection Capacity Utilization			149.8%		ICU Level of Service				H			
Analysis Period (min)			15									

c Critical Lane Group













HCM 2010 Signalized Intersection Summary
19: Hetherton & 3rd

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	455	1678	0	0	0	0	0	825	541
Future Volume (veh/h)	0	0	0	455	1678	0	0	0	0	0	825	541
Number				1	6	16				3	8	18
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.84
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1545	1573	0				0	1573	1485
Adj Flow Rate, veh/h				495	1824	0				0	897	579
Adj No. of Lanes				1	3	0				0	3	1
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				721	2004	0				0	1955	481
Arrive On Green				0.14	0.14	0.00				0.00	0.15	0.15
Sat Flow, veh/h				1471	4718	0				0	4435	1057
Grp Volume(v), veh/h				495	1824	0				0	897	579
Grp Sat Flow(s),veh/h/ln				1471	1573	0				0	1431	1057
Q Serve(g_s), s				24.4	28.6	0.0				0.0	14.3	34.1
Cycle Q Clear(g_c), s				24.4	28.6	0.0				0.0	14.3	34.1
Prop In Lane				1.00		0.00				0.00		1.00
Lane Grp Cap(c), veh/h				721	2004	0				0	1955	481
V/C Ratio(X)				0.69	0.91	0.00				0.00	0.46	1.20
Avail Cap(c_a), veh/h				724	2013	0				0	1955	481
HCM Platoon Ratio				0.33	0.33	1.00				1.00	0.33	0.33
Upstream Filter(I)				0.18	0.18	0.00				0.00	0.75	0.75
Uniform Delay (d), s/veh				29.0	30.8	0.0				0.0	23.4	31.9
Incr Delay (d2), s/veh				0.5	1.3	0.0				0.0	0.6	105.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.1	12.7	0.0				0.0	5.8	24.1
LnGrp Delay(d),s/veh				29.5	32.2	0.0				0.0	24.0	137.5
LnGrp LOS				C	C						C	F
Approach Vol, veh/h					2319						1476	
Approach Delay, s/veh					31.6						68.5	
Approach LOS					C						E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs						6		8				
Phs Duration (G+Y+Rc), s						35.9		39.1				
Change Period (Y+Rc), s						4.0		5.0				
Max Green Setting (Gmax), s						32.0		34.0				
Max Q Clear Time (g_c+I1), s						30.6		36.1				
Green Ext Time (p_c), s						1.3		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay					46.0							
HCM 2010 LOS					D							
Notes												
User approved volume balancing among the lanes for turning movement.												




















HCM 2010 Signalized Intersection Summary
20: Irwin & 3rd/3rd St

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑	↑	↑↑↑				
Traffic Volume (veh/h)	0	0	0	0	1100	120	1043	1211	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1100	120	1043	1211	0	0	0	0
Number				1	6	16	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.94	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1485	1485	1398	1398	0			
Adj Flow Rate, veh/h				0	1196	104	1134	1316	0			
Adj No. of Lanes				0	3	1	2	2	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	3	3	3	3	0			
Cap, veh/h				0	1332	389	1468	1542	0			
Arrive On Green				0.00	0.33	0.33	0.18	0.18	0.00			
Sat Flow, veh/h				0	4189	1184	2663	2796	0			
Grp Volume(v), veh/h				0	1196	104	1134	1316	0			
Grp Sat Flow(s),veh/h/ln				0	1352	1184	1331	1398	0			
Q Serve(g_s), s				0.0	21.1	4.8	30.4	34.2	0.0			
Cycle Q Clear(g_c), s				0.0	21.1	4.8	30.4	34.2	0.0			
Prop In Lane				0.00		1.00	1.00		0.00			
Lane Grp Cap(c), veh/h				0	1332	389	1468	1542	0			
V/C Ratio(X)				0.00	0.90	0.27	0.77	0.85	0.00			
Avail Cap(c_a), veh/h				0	1379	403	1468	1542	0			
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	0.09	0.09	0.00			
Uniform Delay (d), s/veh				0.0	24.0	18.5	26.2	27.7	0.0			
Incr Delay (d2), s/veh				0.0	8.0	0.4	0.4	0.6	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	8.8	1.6	11.3	13.4	0.0			
LnGrp Delay(d),s/veh				0.0	32.0	18.9	26.6	28.3	0.0			
LnGrp LOS					C	B	C	C				
Approach Vol, veh/h					1300			2450				
Approach Delay, s/veh					30.9			27.5				
Approach LOS					C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				45.9		29.1						
Change Period (Y+Rc), s				4.5		4.5						
Max Green Setting (Gmax), s				40.5		25.5						
Max Q Clear Time (g_c+I1), s				36.2		23.1						
Green Ext Time (p_c), s				3.8		1.6						
Intersection Summary												
HCM 2010 Ctrl Delay				28.7								
HCM 2010 LOS				C								
Notes												



















HCM 2010 Signalized Intersection Summary
21: D & 2nd

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  										
Traffic Volume (veh/h)	0	2061	90	0	0	0	0	0	270	80	475	0
Future Volume (veh/h)	0	2061	90	0	0	0	0	0	270	80	475	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1660	1710				0	1573	1620	1748	1748	0
Adj Flow Rate, veh/h	0	2240	91				0	0	277	87	516	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	0	0	0				0	0	420	246	565	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.32	0.11	0.11	0.00
Sat Flow, veh/h		0					0	0	1300	1072	1748	0
Grp Volume(v), veh/h		0.0					0	0	277	87	516	0
Grp Sat Flow(s),veh/h/ln							0	0	1300	1072	1748	0
Q Serve(g_s), s							0.0	0.0	13.7	6.0	21.9	0.0
Cycle Q Clear(g_c), s							0.0	0.0	13.7	19.7	21.9	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	420	246	565	0
V/C Ratio(X)							0.00	0.00	0.66	0.35	0.91	0.00
Avail Cap(c_a), veh/h							0	0	440	263	592	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	0.86	0.86	0.00
Uniform Delay (d), s/veh							0.0	0.0	21.8	38.2	32.5	0.0
Incr Delay (d2), s/veh							0.0	0.0	2.6	0.3	15.7	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	5.2	1.8	13.1	0.0
LnGrp Delay(d),s/veh							0.0	0.0	24.4	38.5	48.2	0.0
LnGrp LOS									C	D	D	
Approach Vol, veh/h								277			603	
Approach Delay, s/veh								24.4			46.8	
Approach LOS								C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				28.8				28.8				
Change Period (Y+Rc), s				4.6				4.6				
Max Green Setting (Gmax), s				25.4				25.4				
Max Q Clear Time (g_c+I1), s				23.9				15.7				
Green Ext Time (p_c), s				0.3				0.6				
Intersection Summary												
HCM 2010 Ctrl Delay				39.8								
HCM 2010 LOS				D								













HCM 2010 Signalized Intersection Summary
22: C & 2nd

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						  				
Traffic Volume (veh/h)	110	2301	0	0	0	0	0	225	100	0	0	0
Future Volume (veh/h)	110	2301	0	0	0	0	0	225	100	0	0	0
Number	1	6	16				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1440	1485	0				0	1485	1440			
Adj Flow Rate, veh/h	120	2501	0				0	245	107			
Adj No. of Lanes	0	3	0				0	2	0			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0				0	3	3			
Cap, veh/h	166	2789	0				0	361	152			
Arrive On Green	0.23	0.23	0.00				0.00	0.18	0.18			
Sat Flow, veh/h	159	3990	0				0	1966	827			
Grp Volume(v), veh/h	927	1694	0				0	183	169			
Grp Sat Flow(s),veh/h/ln	1446	1352	0				0	1485	1308			
Q Serve(g_s), s	39.4	45.6	0.0				0.0	8.6	9.1			
Cycle Q Clear(g_c), s	46.9	45.6	0.0				0.0	8.6	9.1			
Prop In Lane	0.13		0.00				0.00		0.63			
Lane Grp Cap(c), veh/h	1065	1890	0				0	273	240			
V/C Ratio(X)	0.87	0.90	0.00				0.00	0.67	0.70			
Avail Cap(c_a), veh/h	1065	1890	0				0	412	363			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	0.16	0.16	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	26.6	26.2	0.0				0.0	28.5	28.7			
Incr Delay (d2), s/veh	1.7	1.2	0.0				0.0	6.0	7.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	19.3	17.4	0.0				0.0	4.0	3.8			
LnGrp Delay(d),s/veh	28.3	27.4	0.0				0.0	34.5	36.5			
LnGrp LOS	C	C						C	D			
Approach Vol, veh/h		2621						352				
Approach Delay, s/veh		27.8						35.5				
Approach LOS		C						D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				18.0		57.0						
Change Period (Y+Rc), s				* 4.2		4.6						
Max Green Setting (Gmax), s				* 21		45.4						
Max Q Clear Time (g_c+I1), s				11.1		48.9						
Green Ext Time (p_c), s				2.0		0.0						
Intersection Summary												
HCM 2010 Ctrl Delay			28.7									
HCM 2010 LOS			C									
Notes												

















HCM 2010 Signalized Intersection Summary
23: B & 2nd

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑		↑	↑	
Traffic Volume (veh/h)	0	2326	70	0	0	0	0	0	170	70	230	0
Future Volume (veh/h)	0	2326	70	0	0	0	0	0	170	70	230	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.93	0.97		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1485	1382				0	1573	1591	1545	1485	0
Adj Flow Rate, veh/h	0	2528	72				0	0	165	76	250	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	0	0	0				0	0	291	216	346	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.23	0.08	0.08	0.00
Sat Flow, veh/h		0					0	0	1247	1036	1485	0
Grp Volume(v), veh/h		0.0					0	0	165	76	250	0
Grp Sat Flow(s),veh/h/ln							0	0	1247	1036	1485	0
Q Serve(g_s), s							0.0	0.0	8.8	5.4	12.3	0.0
Cycle Q Clear(g_c), s							0.0	0.0	8.8	14.2	12.3	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	291	216	346	0
V/C Ratio(X)							0.00	0.00	0.57	0.35	0.72	0.00
Avail Cap(c_a), veh/h							0	0	357	272	426	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	0.90	0.90	0.00
Uniform Delay (d), s/veh							0.0	0.0	25.4	37.4	32.2	0.0
Incr Delay (d2), s/veh							0.0	0.0	0.7	0.3	2.8	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	3.1	1.6	5.3	0.0
LnGrp Delay(d),s/veh							0.0	0.0	26.1	37.7	35.1	0.0
LnGrp LOS									C	D	D	
Approach Vol, veh/h								165			326	
Approach Delay, s/veh								26.1			35.7	
Approach LOS								C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				22.0				22.0				
Change Period (Y+Rc), s				4.5				4.5				
Max Green Setting (Gmax), s				21.5				21.5				
Max Q Clear Time (g_c+I1), s				16.2				10.8				
Green Ext Time (p_c), s				0.4				0.3				
Intersection Summary												
HCM 2010 Ctrl Delay				32.5								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary
24: A & 2nd

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	2251	205	0	0	0	0	260	20	50	125	0
Future Volume (veh/h)	100	2251	205	0	0	0	0	260	20	50	125	0
Number	5	2	12				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97				1.00		0.95	0.98		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1748	1800				0	1660	1710	1660	1660	0
Adj Flow Rate, veh/h	109	2447	210				0	283	13	54	136	0
Adj No. of Lanes	0	3	0				0	2	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	124	2930	253				0	448	20	156	366	0
Arrive On Green	0.22	0.22	0.22				0.00	0.15	0.15	0.01	0.07	0.00
Sat Flow, veh/h	187	4423	383				0	3147	140	1581	1660	0
Grp Volume(v), veh/h	1013	840	914				0	145	151	54	136	0
Grp Sat Flow(s),veh/h/ln	1738	1590	1664				0	1577	1627	1581	1660	0
Q Serve(g_s), s	42.3	37.5	39.3				0.0	6.5	6.6	0.0	5.9	0.0
Cycle Q Clear(g_c), s	42.3	37.5	39.3				0.0	6.5	6.6	0.0	5.9	0.0
Prop In Lane	0.11		0.23				0.00		0.09	1.00		0.00
Lane Grp Cap(c), veh/h	1152	1054	1103				0	231	238	156	366	0
V/C Ratio(X)	0.88	0.80	0.83				0.00	0.63	0.64	0.35	0.37	0.00
Avail Cap(c_a), veh/h	1152	1054	1103				0	336	347	170	487	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	0.09	0.09	0.09				0.00	1.00	1.00	0.81	0.81	0.00
Uniform Delay (d), s/veh	26.4	24.5	25.2				0.0	30.1	30.1	35.9	29.8	0.0
Incr Delay (d2), s/veh	1.0	0.6	0.7				0.0	5.9	5.9	2.3	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.7	16.7	18.4				0.0	3.2	3.3	1.2	2.8	0.0
LnGrp Delay(d),s/veh	27.4	25.1	25.9				0.0	36.0	36.0	38.2	30.9	0.0
LnGrp LOS	C	C	C					D	D	D	C	
Approach Vol, veh/h		2766						296			190	
Approach Delay, s/veh		26.2						36.0			33.0	
Approach LOS		C						D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		54.3		20.7			5.6	15.2				
Change Period (Y+Rc), s		4.6		* 4.2			* 4.2	* 4.2				
Max Green Setting (Gmax), s		44.2		* 22			* 2	* 16				
Max Q Clear Time (g_c+I1), s		44.3		7.9			2.0	8.6				
Green Ext Time (p_c), s		0.0		0.8			0.0	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			27.5									
HCM 2010 LOS			C									
Notes												

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

BioMarin
Cumulative + BioMarin Only Conditions
AM Peak Hour

Intersection 25 Brooks St/2nd St Side-street Stop


















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	37	33	90.5%	19.9	7.3	C
	Through						
	Right Turn						
	Subtotal	37	33	90.5%	19.9	7.3	C
EB	Left Turn	25	27	107.5%	3.3	0.9	A
	Through	2,306	2,305	99.9%	2.7	0.3	A
	Right Turn						
	Subtotal	2,331	2,332	100.0%	2.7	0.3	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,368	2,365	99.9%	2.9	0.3	A

Intersection 26 Lindaro St/2nd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	52	58	111.1%	15.8	4.7	B
	Right Turn	281	278	99.0%	20.1	5.0	C
	Subtotal	333	336	100.9%	19.4	4.6	B
SB	Left Turn	72	70	97.6%	40.2	6.1	D
	Through	442	394	89.2%	35.4	3.0	D
	Right Turn						
	Subtotal	514	464	90.4%	36.0	3.1	D
EB	Left Turn	41	30	73.6%	15.5	5.6	B
	Through	2,277	2,260	99.2%	15.0	2.2	B
	Right Turn	60	57	94.5%	10.9	2.9	B
	Subtotal	2,378	2,347	98.7%	14.9	2.2	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,225	3,147	97.6%	18.5	1.8	B



















HCM 2010 Signalized Intersection Summary
27: Lincoln & 2nd

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	2450	40	0	0	0	0	111	50	140	270	0
Future Volume (veh/h)	140	2450	40	0	0	0	0	111	50	140	270	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1398	1398				0	1398	1398	1382	1342	0
Adj Flow Rate, veh/h	152	2663	26				0	121	41	152	293	0
Adj No. of Lanes	0	4	1				0	1	1	0	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	146	2754	656				0	429	353	245	459	0
Arrive On Green	0.19	0.19	0.19				0.00	0.31	0.31	0.10	0.10	0.00
Sat Flow, veh/h	252	4741	1130				0	1398	1149	538	1555	0
Grp Volume(v), veh/h	837	1978	26				0	121	41	229	216	0
Grp Sat Flow(s),veh/h/ln	1385	1202	1130				0	1398	1149	872	1160	0
Q Serve(g_s), s	43.6	40.6	1.4				0.0	4.9	1.9	15.1	13.3	0.0
Cycle Q Clear(g_c), s	43.6	40.6	1.4				0.0	4.9	1.9	20.0	13.3	0.0
Prop In Lane	0.18		1.00				0.00		1.00	0.66		0.00
Lane Grp Cap(c), veh/h	805	2095	656				0	429	353	348	356	0
V/C Ratio(X)	1.04	0.94	0.04				0.00	0.28	0.12	0.66	0.60	0.00
Avail Cap(c_a), veh/h	805	2095	656				0	500	411	399	415	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	0.09	0.09	0.09				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.3	29.1	13.3				0.0	19.7	18.7	33.8	29.3	0.0
Incr Delay (d2), s/veh	22.1	1.2	0.0				0.0	0.4	0.1	3.3	1.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.7	13.8	0.4				0.0	1.9	0.6	5.0	4.5	0.0
LnGrp Delay(d),s/veh	52.4	30.4	13.3				0.0	20.1	18.8	37.1	31.2	0.0
LnGrp LOS	F	C	B					C	B	D	C	
Approach Vol, veh/h		2841						162			445	
Approach Delay, s/veh		36.7						19.7			34.3	
Approach LOS		D						B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		47.8		27.2				27.2				
Change Period (Y+Rc), s		* 4.2		* 4.2				* 4.2				
Max Green Setting (Gmax), s		* 40		* 27				* 27				
Max Q Clear Time (g_c+I1), s		45.6		6.9				22.0				
Green Ext Time (p_c), s		0.0		0.6				0.9				
Intersection Summary												
HCM 2010 Ctrl Delay			35.6									
HCM 2010 LOS			D									
Notes												

















HCM 2010 Signalized Intersection Summary
 28: Francisco W./Tamalpais & 2nd

Cumulative Plus BioMarin Only Conditions
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	2505	70	0	0	0	0	50	270	100	200	0
Future Volume (veh/h)	50	2505	70	0	0	0	0	50	270	100	200	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1398	1398				0	1398	1454	1398	1398	0
Adj Flow Rate, veh/h	54	2723	48				0	54	254	109	217	0
Adj No. of Lanes	0	4	1				0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	52	2794	615				0	360	310	288	360	0
Arrive On Green	0.19	0.19	0.19				0.00	0.26	0.26	0.26	0.26	0.00
Sat Flow, veh/h	91	4910	1081				0	1398	1204	845	1398	0
Grp Volume(v), veh/h	828	1949	48				0	54	254	109	217	0
Grp Sat Flow(s),veh/h/ln	1394	1202	1081				0	1398	1204	845	1398	0
Q Serve(g_s), s	42.7	40.1	2.7				0.0	2.2	14.9	8.6	10.2	0.0
Cycle Q Clear(g_c), s	42.7	40.1	2.7				0.0	2.2	14.9	10.8	10.2	0.0
Prop In Lane	0.07		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	793	2053	615				0	360	310	288	360	0
V/C Ratio(X)	1.04	0.95	0.08				0.00	0.15	0.82	0.38	0.60	0.00
Avail Cap(c_a), veh/h	793	2053	615				0	513	441	381	513	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.09	0.09	0.09				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.5	29.4	14.2				0.0	21.5	26.2	25.7	24.5	0.0
Incr Delay (d2), s/veh	23.8	1.4	0.0				0.0	0.2	8.0	0.8	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.7	13.6	0.8				0.0	0.9	5.6	2.1	4.1	0.0
LnGrp Delay(d),s/veh	54.2	30.8	14.3				0.0	21.7	34.2	26.5	26.1	0.0
LnGrp LOS	F	C	B					C	C	C	C	
Approach Vol, veh/h		2825						308			326	
Approach Delay, s/veh		37.4						32.0			26.2	
Approach LOS		D						C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		49.2		25.8				25.8				
Change Period (Y+Rc), s		6.5		6.5				6.5				
Max Green Setting (Gmax), s		34.5		27.5				27.5				
Max Q Clear Time (g_c+I1), s		44.7		16.9				12.8				
Green Ext Time (p_c), s		0.0		2.4				2.8				
Intersection Summary												
HCM 2010 Ctrl Delay			35.8									
HCM 2010 LOS			D									





















HCM 2010 Signalized Intersection Summary
 29: 101 SBO n 2nd/Hetherton & 2nd/2nd St

Cumulative Plus BioMarin Only Conditions
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1266	1449	0	0	0	0	0	0	220	1060	0
Future Volume (veh/h)	0	1266	1449	0	0	0	0	0	0	220	1060	0
Number	5	2	12							7	4	14
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1485	1485							1485	1485	0
Adj Flow Rate, veh/h	0	1376	1562							239	1152	0
Adj No. of Lanes	0	3	2							1	2	0
Peak Hour Factor	0.92	0.92	0.92							0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3							3	3	0
Cap, veh/h	0	2406	1364							406	852	0
Arrive On Green	0.00	0.18	0.18							0.09	0.09	0.00
Sat Flow, veh/h	0	4456	2525							1415	2971	0
Grp Volume(v), veh/h	0	1376	1562							239	1152	0
Grp Sat Flow(s),veh/h/ln	0	1485	1263							1415	1485	0
Q Serve(g_s), s	0.0	21.2	40.5							12.1	21.5	0.0
Cycle Q Clear(g_c), s	0.0	21.2	40.5							12.1	21.5	0.0
Prop In Lane	0.00		1.00							1.00		0.00
Lane Grp Cap(c), veh/h	0	2406	1364							406	852	0
V/C Ratio(X)	0.00	0.57	1.15							0.59	1.35	0.00
Avail Cap(c_a), veh/h	0	2406	1364							406	852	0
HCM Platoon Ratio	1.00	0.33	0.33							0.33	0.33	1.00
Upstream Filter(l)	0.00	0.09	0.09							0.86	0.86	0.00
Uniform Delay (d), s/veh	0.0	22.9	30.8							29.7	34.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	66.4							1.9	165.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.7	26.7							5.0	28.4	0.0
LnGrp Delay(d),s/veh	0.0	23.0	97.2							31.7	199.4	0.0
LnGrp LOS		C	F							C	F	
Approach Vol, veh/h		2938									1391	
Approach Delay, s/veh		62.4									170.6	
Approach LOS		E									F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		49.0		26.0								
Change Period (Y+Rc), s		8.5		4.5								
Max Green Setting (Gmax), s		40.5		21.5								
Max Q Clear Time (g_c+I1), s		42.5		23.5								
Green Ext Time (p_c), s		0.0		0.0								
Intersection Summary												
HCM 2010 Ctrl Delay			97.2									
HCM 2010 LOS			F									
Notes												
User approved volume balancing among the lanes for turning movement.												





















HCM 2010 Signalized Intersection Summary
30: Irwin & 2nd St

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						  				
Traffic Volume (veh/h)	776	880	0	0	0	0	0	1488	500	0	0	0
Future Volume (veh/h)	776	880	0	0	0	0	0	1488	500	0	0	0
Number	5	2	12				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1454	1485	0				0	1398	1398			
Adj Flow Rate, veh/h	843	957	0				0	1617	489			
Adj No. of Lanes	2	2	0				0	3	1			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0				0	3	3			
Cap, veh/h	1551	1458	0				0	1466	451			
Arrive On Green	0.16	0.16	0.00				0.00	0.38	0.38			
Sat Flow, veh/h	2769	2971	0				0	3943	1174			
Grp Volume(v), veh/h	843	957	0				0	1617	489			
Grp Sat Flow(s),veh/h/ln	1385	1485	0				0	1272	1174			
Q Serve(g_s), s	21.3	22.7	0.0				0.0	28.8	28.8			
Cycle Q Clear(g_c), s	21.3	22.7	0.0				0.0	28.8	28.8			
Prop In Lane	1.00		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	1551	1458	0				0	1466	451			
V/C Ratio(X)	0.54	0.66	0.00				0.00	1.10	1.08			
Avail Cap(c_a), veh/h	1551	1458	0				0	1466	451			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	0.35	0.35	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	24.9	25.5	0.0				0.0	23.1	23.1			
Incr Delay (d2), s/veh	0.5	0.8	0.0				0.0	57.2	67.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.3	9.5	0.0				0.0	17.8	17.7			
LnGrp Delay(d),s/veh	25.4	26.3	0.0				0.0	80.3	90.1			
LnGrp LOS	C	C						F	F			
Approach Vol, veh/h		1800						2106				
Approach Delay, s/veh		25.9						82.5				
Approach LOS		C						F				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		41.0		34.0								
Change Period (Y+Rc), s		* 4.2		* 5.2								
Max Green Setting (Gmax), s		* 37		* 29								
Max Q Clear Time (g_c+I1), s		24.7		30.8								
Green Ext Time (p_c), s		10.3		0.0								
Intersection Summary												
HCM 2010 Ctrl Delay			56.4									
HCM 2010 LOS			E									
Notes												

HCM 2010 Signalized Intersection Summary
31: Lindaro & Andersen

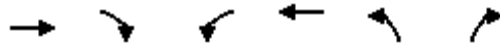
Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	20	330	50	10	80	220	63	60	299	160	71	221
Future Volume (veh/h)	20	330	50	10	80	220	63	60	299	160	71	221
Number	5	2	12		1	6	16	3	8	18	7	4
Initial Q (Qb), veh	0	0	0		0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94		1.00		0.97	1.00		0.97	1.00	
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	2019	2019	2000		1942	1942	2000	1845	1845	1900	1845	1845
Adj Flow Rate, veh/h	22	359	46		87	239	56	65	325	150	77	240
Adj No. of Lanes	1	1	0		1	1	0	1	1	0	1	1
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
Percent Heavy Veh, %	3	3	3		3	3	3	3	3	3	3	3
Cap, veh/h	58	433	56		153	456	107	164	375	173	178	547
Arrive On Green	0.03	0.25	0.25		0.08	0.30	0.30	0.09	0.32	0.32	0.10	0.33
Sat Flow, veh/h	1923	1741	223		1849	1513	354	1757	1182	546	1757	1682
Grp Volume(v), veh/h	22	0	405		87	0	295	65	0	475	77	0
Grp Sat Flow(s),veh/h/ln	1923	0	1965		1849	0	1867	1757	0	1728	1757	0
Q Serve(g_s), s	0.8	0.0	13.3		3.1	0.0	9.0	2.4	0.0	17.7	2.8	0.0
Cycle Q Clear(g_c), s	0.8	0.0	13.3		3.1	0.0	9.0	2.4	0.0	17.7	2.8	0.0
Prop In Lane	1.00		0.11		1.00		0.19	1.00		0.32	1.00	
Lane Grp Cap(c), veh/h	58	0	489		153	0	563	164	0	548	178	0
V/C Ratio(X)	0.38	0.00	0.83		0.57	0.00	0.52	0.40	0.00	0.87	0.43	0.00
Avail Cap(c_a), veh/h	225	0	635		270	0	658	231	0	677	231	0
HCM Platoon Ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00		1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.6	0.0	24.3		30.2	0.0	19.8	29.2	0.0	22.0	28.9	0.0
Incr Delay (d2), s/veh	1.5	0.0	7.0		1.2	0.0	0.8	0.6	0.0	9.8	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	8.2		1.6	0.0	4.7	1.2	0.0	9.9	1.4	0.0
LnGrp Delay(d),s/veh	34.1	0.0	31.3		31.4	0.0	20.6	29.8	0.0	31.7	29.5	0.0
LnGrp LOS	C		C		C		C	C		C	C	
Approach Vol, veh/h		427				382			540			335
Approach Delay, s/veh		31.5				23.0			31.5			21.2
Approach LOS		C				C			C			C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.7	21.9	10.4	26.4	6.1	25.5	10.9	25.9				
Change Period (Y+Rc), s	4.0	4.9	4.0	* 4.2	4.0	4.9	4.0	* 4.2				
Max Green Setting (Gmax), s	10.0	22.1	9.0	* 27	8.0	24.1	9.0	* 27				
Max Q Clear Time (g_c+I1), s	5.1	15.3	4.4	9.7	2.8	11.0	4.8	19.7				
Green Ext Time (p_c), s	0.1	1.0	0.0	0.9	0.0	0.9	0.0	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			27.5									
HCM 2010 LOS			C									
Notes												

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	20
Future Volume (veh/h)	20
Number	14
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	0.92
Parking Bus, Adj	1.00
Adj Sat Flow, veh/h/ln	1900
Adj Flow Rate, veh/h	18
Adj No. of Lanes	0
Peak Hour Factor	0.92
Percent Heavy Veh, %	3
Cap, veh/h	41
Arrive On Green	0.33
Sat Flow, veh/h	126
Grp Volume(v), veh/h	258
Grp Sat Flow(s),veh/h/ln	1809
Q Serve(g_s), s	7.7
Cycle Q Clear(g_c), s	7.7
Prop In Lane	0.07
Lane Grp Cap(c), veh/h	588
V/C Ratio(X)	0.44
Avail Cap(c_a), veh/h	709
HCM Platoon Ratio	1.00
Upstream Filter(l)	1.00
Uniform Delay (d), s/veh	18.2
Incr Delay (d2), s/veh	0.5
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	3.9
LnGrp Delay(d),s/veh	18.7
LnGrp LOS	B
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	

HCM Signalized Intersection Capacity Analysis
32: Tamalpais & Mission

Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻		
Traffic Volume (vph)	585	75	0	740	0	0
Future Volume (vph)	585	75	0	740	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.6			3.0		
Lane Util. Factor	1.00			1.00		
Frbp, ped/bikes	0.99			1.00		
Flpb, ped/bikes	1.00			1.00		
Frt	0.98			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	1540			1573		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	1540			1573		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	636	82	0	804	0	0
RTOR Reduction (vph)	6	0	0	0	0	0
Lane Group Flow (vph)	712	0	0	804	0	0
Confl. Peds. (#/hr)		10	10		10	
Turn Type	NA			NA		
Protected Phases	2			3 4 6		
Permitted Phases						
Actuated Green, G (s)	34.4			51.8		
Effective Green, g (s)	34.4			46.2		
Actuated g/C Ratio	0.46			0.62		
Clearance Time (s)	5.6					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	706			968		
v/s Ratio Prot	c0.46			c0.51		
v/s Ratio Perm						
v/c Ratio	1.01			0.83		
Uniform Delay, d1	20.3			11.3		
Progression Factor	0.97			0.51		
Incremental Delay, d2	30.6			0.6		
Delay (s)	50.4			6.3		
Level of Service	D			A		
Approach Delay (s)	50.4			6.3	0.0	
Approach LOS	D			A	A	
Intersection Summary						
HCM 2000 Control Delay			27.1		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.79			
Actuated Cycle Length (s)			75.0		Sum of lost time (s)	19.0
Intersection Capacity Utilization			102.6%		ICU Level of Service	G
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
33: Tamalpais & 5th

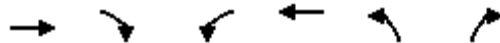
Cumulative Plus BioMarin Only Conditions
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↔			↑						↕			
Traffic Volume (vph)	0	390	50	0	380	0	0	0	0	20	20	30		
Future Volume (vph)	0	390	50	0	380	0	0	0	0	20	20	30		
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800		
Total Lost time (s)		5.6			5.6						5.6			
Lane Util. Factor		1.00			1.00						1.00			
Frbp, ped/bikes		0.99			1.00						0.98			
Flpb, ped/bikes		1.00			1.00						1.00			
Frt		0.98			1.00						0.94			
Flt Protected		1.00			1.00						0.99			
Satd. Flow (prot)		1541			1573						1432			
Flt Permitted		1.00			1.00						0.99			
Satd. Flow (perm)		1541			1573						1432			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	0	424	54	0	413	0	0	0	0	22	22	33		
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	29	0		
Lane Group Flow (vph)	0	473	0	0	413	0	0	0	0	0	48	0		
Confl. Peds. (#/hr)	10		10	10		10	10					10		
Turn Type		NA			NA					Perm	NA			
Protected Phases		2			4	6					8			
Permitted Phases										8				
Actuated Green, G (s)		39.3			55.7						8.1			
Effective Green, g (s)		39.3			55.7						8.1			
Actuated g/C Ratio		0.52			0.74						0.11			
Clearance Time (s)		5.6									5.6			
Vehicle Extension (s)		3.0									1.5			
Lane Grp Cap (vph)		807			1168						154			
v/s Ratio Prot		c0.31			c0.26									
v/s Ratio Perm											0.03			
v/c Ratio		0.59			0.35						0.31			
Uniform Delay, d1		12.3			3.4						30.9			
Progression Factor		0.57			0.09						0.85			
Incremental Delay, d2		1.8			0.1						0.0			
Delay (s)		8.8			0.4						26.2			
Level of Service		A			A						C			
Approach Delay (s)		8.8			0.4			0.0			26.2			
Approach LOS		A			A			A			C			
Intersection Summary														
HCM 2000 Control Delay			6.6									HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio			0.52											
Actuated Cycle Length (s)			75.0								16.8		Sum of lost time (s)	
Intersection Capacity Utilization			80.3%										ICU Level of Service	D
Analysis Period (min)			15											
c Critical Lane Group														

HCM Signalized Intersection Capacity Analysis
 34: Tamalpais & Mission

Cumulative Plus BioMarin Only Conditions
 Timing Plan: AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Traffic Volume (vph)	585	0	0	730	10	20
Future Volume (vph)	585	0	0	730	10	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.6			5.6	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.91	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	1573			1573	1408	
Flt Permitted	1.00			1.00	0.98	
Satd. Flow (perm)	1573			1573	1408	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	636	0	0	793	11	22
RTOR Reduction (vph)	0	0	0	0	19	0
Lane Group Flow (vph)	636	0	0	793	14	0
Confl. Peds. (#/hr)		10				
Turn Type	NA			NA	Prot	
Protected Phases	2 8			6	3 4	
Permitted Phases						
Actuated Green, G (s)	52.4			34.4	11.8	
Effective Green, g (s)	47.2			34.4	11.8	
Actuated g/C Ratio	0.63			0.46	0.16	
Clearance Time (s)				5.6		
Vehicle Extension (s)				3.0		
Lane Grp Cap (vph)	989			721	221	
v/s Ratio Prot	c0.40			c0.50	c0.01	
v/s Ratio Perm						
v/c Ratio	0.64			1.10	0.07	
Uniform Delay, d1	8.7			20.3	26.9	
Progression Factor	0.45			1.16	1.05	
Incremental Delay, d2	0.1			57.1	0.0	
Delay (s)	4.0			80.6	28.4	
Level of Service	A			F	C	
Approach Delay (s)	4.0			80.6	28.4	
Approach LOS	A			F	C	













Intersection Summary			
HCM 2000 Control Delay	46.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	102.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

35: Tamalpais & 5th













Cumulative Plus BioMarin Only Conditions

Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑			↑				
Traffic Volume (vph)	0	410	0	0	350	20	30	10	30	0	0	0
Future Volume (vph)	0	410	0	0	350	20	30	10	30	0	0	0
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.6			5.6			5.6				
Lane Util. Factor		1.00			1.00			1.00				
Frbp, ped/bikes		1.00			1.00			0.98				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.99			0.94				
Flt Protected		1.00			1.00			0.98				
Satd. Flow (prot)		1573			1557			1422				
Flt Permitted		1.00			1.00			0.98				
Satd. Flow (perm)		1573			1557			1422				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	446	0	0	380	22	33	11	33	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	28	0	0	0	0
Lane Group Flow (vph)	0	446	0	0	400	0	0	49	0	0	0	0
Confl. Peds. (#/hr)	10					10			10			
Turn Type		NA			NA		Split	NA				
Protected Phases		2 8			6		4	4				
Permitted Phases												
Actuated Green, G (s)		53.0			39.3			10.8				
Effective Green, g (s)		53.0			39.3			10.8				
Actuated g/C Ratio		0.71			0.52			0.14				
Clearance Time (s)					5.6			5.6				
Vehicle Extension (s)					3.0			1.5				
Lane Grp Cap (vph)		1111			815			204				
v/s Ratio Prot		c0.28			c0.26			c0.03				
v/s Ratio Perm												
v/c Ratio		0.40			0.49			0.24				
Uniform Delay, d1		4.5			11.4			28.5				
Progression Factor		0.02			0.65			1.26				
Incremental Delay, d2		0.1			2.0			0.1				
Delay (s)		0.1			9.4			36.1				
Level of Service		A			A			D				
Approach Delay (s)		0.1			9.4			36.1			0.0	
Approach LOS		A			A			D			A	
Intersection Summary												
HCM 2000 Control Delay			7.1				HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			75.0				Sum of lost time (s)		16.8			
Intersection Capacity Utilization			80.3%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												




















HCM Signalized Intersection Capacity Analysis
 36: Tamalpais & 4th

Cumulative Plus BioMarin Only Conditions
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑			↑				
Traffic Volume (vph)	0	500	0	0	420	70	10	10	10	0	0	0
Future Volume (vph)	0	500	0	0	420	70	10	10	10	0	0	0
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.6			5.6			5.6				
Lane Util. Factor		1.00			1.00			1.00				
Frbp, ped/bikes		1.00			0.98			0.99				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.98			0.95				
Flt Protected		1.00			1.00			0.98				
Satd. Flow (prot)		1573			1517			1464				
Flt Permitted		1.00			1.00			0.98				
Satd. Flow (perm)		1573			1517			1464				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	543	0	0	457	76	11	11	11	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	9	0	0	0	0
Lane Group Flow (vph)	0	543	0	0	525	0	0	24	0	0	0	0
Confl. Peds. (#/hr)	39		22			39			10			
Turn Type		NA			NA		Split	NA				
Protected Phases		2 8			6		4	4				
Permitted Phases												
Actuated Green, G (s)		50.3			30.9			13.9				
Effective Green, g (s)		50.3			30.9			13.9				
Actuated g/C Ratio		0.67			0.41			0.19				
Clearance Time (s)					5.6			5.6				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)		1054			625			271				
v/s Ratio Prot		c0.35			c0.35			c0.02				
v/s Ratio Perm												
v/c Ratio		0.52			0.84			0.09				
Uniform Delay, d1		6.2			19.8			25.3				
Progression Factor		0.07			0.98			1.01				
Incremental Delay, d2		0.4			11.5			0.1				
Delay (s)		0.8			30.9			25.7				
Level of Service		A			C			C				
Approach Delay (s)		0.8			30.9			25.7			0.0	
Approach LOS		A			C			C			A	
Intersection Summary												
HCM 2000 Control Delay			16.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			75.0				Sum of lost time (s)			16.4		
Intersection Capacity Utilization			97.1%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
1: Lincoln & Mission

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	495	20	70	550	70	40	525	60	0	400	320
Future Volume (veh/h)	280	495	20	70	550	70	40	525	60	0	400	320
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	0.99		0.93	1.00		0.95
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1676	1676	1710	1676	1676	1710	1800	1694	1728	0	1765	1728
Adj Flow Rate, veh/h	292	516	19	73	573	67	42	547	52	0	417	144
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	0	2	2
Cap, veh/h	279	943	35	397	551	64	97	1035	96	0	937	319
Arrive On Green	0.17	0.59	0.59	0.75	0.75	0.75	0.77	0.77	0.77	0.00	0.39	0.39
Sat Flow, veh/h	1597	1606	59	819	1469	172	119	2672	248	0	2506	823
Grp Volume(v), veh/h	292	0	535	73	0	640	332	0	309	0	287	274
Grp Sat Flow(s),veh/h/ln	1597	0	1665	819	0	1641	1563	0	1477	0	1676	1565
Q Serve(g_s), s	14.0	0.0	15.6	2.2	0.0	30.0	0.0	0.0	6.5	0.0	10.1	10.4
Cycle Q Clear(g_c), s	14.0	0.0	15.6	2.2	0.0	30.0	5.8	0.0	6.5	0.0	10.1	10.4
Prop In Lane	1.00		0.04	1.00		0.10	0.13		0.17	0.00		0.53
Lane Grp Cap(c), veh/h	279	0	978	397	0	615	656	0	572	0	650	606
V/C Ratio(X)	1.05	0.00	0.55	0.18	0.00	1.04	0.51	0.00	0.54	0.00	0.44	0.45
Avail Cap(c_a), veh/h	279	0	978	397	0	615	656	0	572	0	650	606
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.76	0.00	0.76	0.75	0.00	0.75	0.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	0.0	10.0	6.5	0.0	10.0	6.2	0.0	6.2	0.0	18.1	18.2
Incr Delay (d2), s/veh	66.1	0.0	2.2	0.8	0.0	42.5	2.1	0.0	2.7	0.0	2.2	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.3	0.0	7.7	0.6	0.0	19.9	2.9	0.0	2.8	0.0	5.1	4.9
LnGrp Delay(d),s/veh	99.1	0.0	12.2	7.3	0.0	52.5	8.3	0.0	9.0	0.0	20.3	20.6
LnGrp LOS	F		B	A		F	A		A		C	C
Approach Vol, veh/h		827			713			641			561	
Approach Delay, s/veh		42.9			47.9			8.6			20.4	
Approach LOS		D			D			A			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		51.2		35.8	17.0	34.2		35.8				
Change Period (Y+Rc), s		* 4.2		4.6	3.0	* 4.2		4.6				
Max Green Setting (Gmax), s		* 47		24.4	14.0	* 30		24.4				
Max Q Clear Time (g_c+I1), s		17.6		8.5	16.0	32.0		12.4				
Green Ext Time (p_c), s		5.8		5.2	0.0	0.0		3.8				
Intersection Summary												
HCM 2010 Ctrl Delay			31.6									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis

2: Hetherton & Mission

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑						↑↑	↑
Traffic Volume (vph)	0	490	50	40	180	0	0	0	0	250	1226	495
Future Volume (vph)	0	490	50	40	180	0	0	0	0	250	1226	495
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	10	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		0.95			1.00						0.95	1.00
Frbp, ped/bikes		1.00			1.00						1.00	0.98
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.99			1.00						1.00	0.85
Flt Protected		1.00			0.99						0.99	1.00
Satd. Flow (prot)		2769			1781						2992	1321
Flt Permitted		1.00			0.82						0.99	1.00
Satd. Flow (perm)		2769			1474						2992	1321
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	510	52	42	188	0	0	0	0	260	1277	516
RTOR Reduction (vph)	0	10	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	552	0	0	230	0	0	0	0	0	1537	516
Confl. Peds. (#/hr)			15	15		4			11			
Confl. Bikes (#/hr)			3			3			3			2
Turn Type		NA		Perm	NA					Split	NA	custom
Protected Phases		4			8					2	2	
Permitted Phases				8								5
Actuated Green, G (s)		23.8			23.8						47.4	40.4
Effective Green, g (s)		23.8			23.8						47.4	40.4
Actuated g/C Ratio		0.30			0.30						0.59	0.50
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		823			438						1772	667
v/s Ratio Prot		c0.20									c0.51	
v/s Ratio Perm					0.16							0.39
v/c Ratio		0.67			0.53						0.87	0.77
Uniform Delay, d1		24.7			23.4						13.7	16.1
Progression Factor		0.46			0.42						1.00	1.00
Incremental Delay, d2		3.8			3.8						6.0	8.5
Delay (s)		15.2			13.5						19.7	24.6
Level of Service		B			B						B	C
Approach Delay (s)		15.2			13.5			0.0			20.9	
Approach LOS		B			B			A			C	

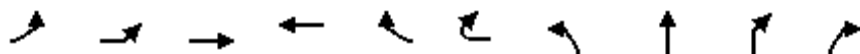
Intersection Summary

HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	98.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

3: Irwin & Mission




















Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour



Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations										
Traffic Volume (vph)	400	20	320	145	320	20	70	1623	200	60
Future Volume (vph)	400	20	320	145	320	20	70	1623	200	60
Ideal Flow (vphpl)	2200	1800	2200	2200	2200	1800	2200	2200	1800	2200
Lane Width	9	12	10	10	9	12	12	12	12	12
Total Lost time (s)		4.2	4.2	4.2	4.2			4.2	4.2	
Lane Util. Factor		1.00	1.00	1.00	1.00			0.95	1.00	
Frbp, ped/bikes		1.00	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	
Frt		1.00	1.00	1.00	0.85			1.00	0.85	
Flt Protected		0.95	1.00	1.00	1.00			1.00	1.00	
Satd. Flow (prot)		1509	1812	1812	1485			3678	1316	
Flt Permitted		0.62	1.00	1.00	1.00			1.00	1.00	
Satd. Flow (perm)		986	1812	1812	1485			3678	1316	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	417	21	333	151	333	21	73	1691	208	62
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	39	0
Lane Group Flow (vph)	0	438	333	151	354	0	0	1764	232	0
Confl. Peds. (#/hr)							8			3
Confl. Bikes (#/hr)					4	4				
Turn Type	pm+pt	pm+pt	NA	NA	Prot		Perm	NA	Perm	
Protected Phases	5	5	2	6	6			4		
Permitted Phases	2	2					4			4
Actuated Green, G (s)		33.8	33.8	18.8	18.8			37.8	37.8	
Effective Green, g (s)		33.8	33.8	18.8	18.8			37.8	37.8	
Actuated g/C Ratio		0.42	0.42	0.24	0.24			0.47	0.47	
Clearance Time (s)		4.2	4.2	4.2	4.2			4.2	4.2	
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0	
Lane Grp Cap (vph)		487	765	425	348			1737	621	
v/s Ratio Prot		c0.12	0.18	0.08	c0.24					
v/s Ratio Perm		0.26						0.48	0.18	
v/c Ratio		0.90	0.44	0.36	1.02			1.02	0.37	
Uniform Delay, d1		21.5	16.3	25.5	30.6			21.1	13.5	
Progression Factor		0.68	0.77	1.00	1.00			0.48	0.24	
Incremental Delay, d2		13.7	0.3	0.5	52.7			19.2	0.9	
Delay (s)		28.4	12.8	26.1	83.3			29.4	4.2	
Level of Service		C	B	C	F			C	A	
Approach Delay (s)			21.7	66.2				26.1		
Approach LOS			C	E				C		
Intersection Summary										
HCM 2000 Control Delay			31.2					HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			1.02							
Actuated Cycle Length (s)			80.0					Sum of lost time (s)		12.6
Intersection Capacity Utilization			103.0%					ICU Level of Service		G
Analysis Period (min)			15							
c	Critical Lane Group									

HCM 2010 Signalized Intersection Summary
4: Lincoln & 5th

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	400	40	30	245	65	60	470	90	90	360	40
Future Volume (veh/h)	90	400	40	30	245	65	60	470	90	90	360	40
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	1.00		0.97	0.98		0.93	0.98		0.93
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1412	1560	1530	1412	1500	1530	1440	1500	1469	1440	1500	1469
Adj Flow Rate, veh/h	94	417	38	31	255	56	62	490	76	94	375	34
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	427	622	57	244	525	115	137	933	142	223	812	75
Arrive On Green	0.44	0.44	0.44	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Sat Flow, veh/h	846	1405	128	745	1185	260	189	2110	321	361	1836	170
Grp Volume(v), veh/h	94	0	455	31	0	311	325	0	303	238	0	265
Grp Sat Flow(s),veh/h/ln	846	0	1533	745	0	1446	1339	0	1280	1046	0	1320
Q Serve(g_s), s	6.0	0.0	18.8	2.1	0.0	3.5	0.0	0.0	4.1	0.9	0.0	3.1
Cycle Q Clear(g_c), s	9.5	0.0	18.8	20.9	0.0	3.5	3.5	0.0	4.1	5.1	0.0	3.1
Prop In Lane	1.00		0.08	1.00		0.18	0.19		0.25	0.39		0.13
Lane Grp Cap(c), veh/h	427	0	679	244	0	640	646	0	566	526	0	584
V/C Ratio(X)	0.22	0.00	0.67	0.13	0.00	0.49	0.50	0.00	0.54	0.45	0.00	0.45
Avail Cap(c_a), veh/h	427	0	679	244	0	640	646	0	566	526	0	584
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.97	0.00	0.97	0.82	0.00	0.82	0.68	0.00	0.68
Uniform Delay (d), s/veh	16.3	0.0	17.7	9.8	0.0	2.8	2.8	0.0	2.8	2.7	0.0	2.7
Incr Delay (d2), s/veh	1.2	0.0	5.2	1.0	0.0	2.5	2.3	0.0	3.0	1.9	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	8.8	0.5	0.0	1.7	1.7	0.0	1.6	1.1	0.0	1.3
LnGrp Delay(d),s/veh	17.4	0.0	22.9	10.8	0.0	5.3	5.1	0.0	5.8	4.6	0.0	4.5
LnGrp LOS	B		C	B		A	A		A	A		A
Approach Vol, veh/h		549			342			628			503	
Approach Delay, s/veh		22.0			5.8			5.4			4.5	
Approach LOS		C			A			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		40.0		40.0		40.0		40.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		35.4		35.4		35.4		35.4				
Max Q Clear Time (g_c+I1), s		20.8		6.1		22.9		7.1				
Green Ext Time (p_c), s		2.4		3.0		1.2		2.5				
Intersection Summary												
HCM 2010 Ctrl Delay			9.8									
HCM 2010 LOS			A									

HCM Signalized Intersection Capacity Analysis
5: Hetherton & 5th

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour




















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↕↕↕	↕
Traffic Volume (vph)	0	360	190	70	180	0	0	0	0	50	1126	140
Future Volume (vph)	0	360	190	70	180	0	0	0	0	50	1126	140
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		1.00			1.00						0.91	1.00
Frbp, ped/bikes		0.99			1.00						1.00	0.95
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.95			1.00						1.00	0.85
Flt Protected		1.00			0.99						1.00	1.00
Satd. Flow (prot)		1700			1773						4164	1147
Flt Permitted		1.00			0.67						1.00	1.00
Satd. Flow (perm)		1700			1209						4164	1147
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	375	198	73	188	0	0	0	0	52	1173	146
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	566	0	0	261	0	0	0	0	0	1225	146
Confl. Peds. (#/hr)	12		12	12		12			12	12		7
Confl. Bikes (#/hr)			6			4			2			2
Parking (#/hr)											2	2
Turn Type		NA		Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases				8						2		5
Actuated Green, G (s)		40.8			40.8						30.4	23.4
Effective Green, g (s)		40.8			40.8						30.4	23.4
Actuated g/C Ratio		0.51			0.51						0.38	0.29
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		867			616						1582	335
v/s Ratio Prot		c0.33										
v/s Ratio Perm					0.22						0.29	0.13
v/c Ratio		0.65			0.42						0.77	0.44
Uniform Delay, d1		14.4			12.3						21.8	22.9
Progression Factor		0.33			0.97						0.70	0.77
Incremental Delay, d2		3.5			1.7						1.9	2.1
Delay (s)		8.3			13.6						17.1	19.6
Level of Service		A			B						B	B
Approach Delay (s)		8.3			13.6			0.0			17.3	
Approach LOS		A			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			14.5								HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			80.0								Sum of lost time (s)	10.8
Intersection Capacity Utilization			95.1%								ICU Level of Service	F
Analysis Period (min)			15									

c Critical Lane Group





















HCM 2010 Signalized Intersection Summary
6: Irwin & 5th

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	160	0	0	140	120	100	1548	20	0	0	0
Future Volume (veh/h)	270	160	0	0	140	120	100	1548	20	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.96			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1588	1588	0	0	1588	1620	1620	1588	1620			
Adj Flow Rate, veh/h	281	167	0	0	146	120	104	1612	19			
Adj No. of Lanes	1	1	0	0	1	0	0	3	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	2	0	2	0			
Cap, veh/h	366	683	0	0	297	244	118	1950	24			
Arrive On Green	0.72	0.72	0.00	0.00	0.43	0.43	0.15	0.15	0.15			
Sat Flow, veh/h	994	1588	0	0	691	568	259	4286	52			
Grp Volume(v), veh/h	281	167	0	0	0	266	632	527	576			
Grp Sat Flow(s),veh/h/ln	994	1588	0	0	0	1259	1575	1445	1577			
Q Serve(g_s), s	22.2	2.9	0.0	0.0	0.0	12.2	31.4	28.2	28.2			
Cycle Q Clear(g_c), s	34.4	2.9	0.0	0.0	0.0	12.2	31.4	28.2	28.2			
Prop In Lane	1.00		0.00	0.00		0.45	0.16		0.03			
Lane Grp Cap(c), veh/h	366	683	0	0	0	541	717	658	717			
V/C Ratio(X)	0.77	0.24	0.00	0.00	0.00	0.49	0.88	0.80	0.80			
Avail Cap(c_a), veh/h	366	683	0	0	0	541	717	658	717			
HCM Platoon Ratio	1.67	1.67	1.00	1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)	0.71	0.71	0.00	0.00	0.00	1.00	0.49	0.49	0.49			
Uniform Delay (d), s/veh	17.6	6.8	0.0	0.0	0.0	16.5	31.9	30.5	30.5			
Incr Delay (d2), s/veh	6.9	0.1	0.0	0.0	0.0	0.7	8.0	5.1	4.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.8	1.3	0.0	0.0	0.0	4.3	15.3	12.2	13.3			
LnGrp Delay(d),s/veh	24.5	7.0	0.0	0.0	0.0	17.2	39.8	35.6	35.2			
LnGrp LOS	C	A				B	D	D	D			
Approach Vol, veh/h		448			266			1735				
Approach Delay, s/veh		18.0			17.2			37.0				
Approach LOS		B			B			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		39.0		41.0		39.0						
Change Period (Y+Rc), s		4.6		4.6		4.6						
Max Green Setting (Gmax), s		34.4		36.4		34.4						
Max Q Clear Time (g_c+I1), s		36.4		33.4		14.2						
Green Ext Time (p_c), s		0.0		2.2		1.1						
Intersection Summary												
HCM 2010 Ctrl Delay				31.4								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary
7: Lincoln & 4th

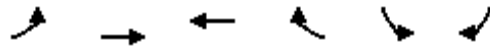
Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	245	40	115	280	155	30	430	90	50	310	70
Future Volume (veh/h)	50	245	40	115	280	155	30	430	90	50	310	70
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	0.97		0.90	0.93		0.83	0.97		0.83
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1588	1525	1620	1588	1588	1620	1620	1588	1555	1620	1588	1555
Adj Flow Rate, veh/h	52	255	34	120	292	135	31	448	73	52	323	52
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	284	647	86	446	493	228	83	934	147	123	719	125
Arrive On Green	0.50	0.50	0.50	0.16	0.16	0.16	0.13	0.13	0.13	0.80	0.80	0.80
Sat Flow, veh/h	861	1300	173	949	991	458	84	2350	370	167	1809	315
Grp Volume(v), veh/h	52	0	289	120	0	427	297	0	255	210	0	217
Grp Sat Flow(s),veh/h/ln	861	0	1473	949	0	1450	1513	0	1291	975	0	1316
Q Serve(g_s), s	4.0	0.0	9.8	9.3	0.0	21.8	0.0	0.0	14.7	4.4	0.0	4.0
Cycle Q Clear(g_c), s	25.8	0.0	9.8	19.1	0.0	21.8	13.9	0.0	14.7	19.0	0.0	4.0
Prop In Lane	1.00		0.12	1.00		0.32	0.10		0.29	0.25		0.24
Lane Grp Cap(c), veh/h	284	0	733	446	0	721	651	0	513	444	0	523
V/C Ratio(X)	0.18	0.00	0.39	0.27	0.00	0.59	0.46	0.00	0.50	0.47	0.00	0.42
Avail Cap(c_a), veh/h	284	0	733	446	0	721	651	0	513	444	0	523
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.93	0.00	0.93	0.80	0.00	0.80	0.80	0.00	0.80
Uniform Delay (d), s/veh	25.6	0.0	12.6	29.3	0.0	25.9	27.0	0.0	27.3	6.7	0.0	5.4
Incr Delay (d2), s/veh	1.4	0.0	1.6	1.4	0.0	3.3	1.9	0.0	2.7	2.9	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	4.3	2.6	0.0	9.4	6.5	0.0	5.6	1.6	0.0	1.6
LnGrp Delay(d),s/veh	27.0	0.0	14.2	30.6	0.0	29.2	28.8	0.0	30.0	9.5	0.0	7.3
LnGrp LOS	C		B	C		C	C		C	A		A
Approach Vol, veh/h		341			547			552			427	
Approach Delay, s/veh		16.1			29.5			29.4			8.4	
Approach LOS		B			C			C			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		44.0		36.0		44.0		36.0				
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2		* 4.2				
Max Green Setting (Gmax), s		* 40		* 32		* 40		* 32				
Max Q Clear Time (g_c+I1), s		27.8		16.7		23.8		21.0				
Green Ext Time (p_c), s		2.3		4.3		4.8		2.7				
Intersection Summary												
HCM 2010 Ctrl Delay				22.2								
HCM 2010 LOS				C								
Notes												

HCM Signalized Intersection Capacity Analysis
8: 4th & Tamalpais

Cumulative Plus BioMarin Only Conditions

Timing Plan: PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↗
Traffic Volume (vph)	0	465	440	0	0	120
Future Volume (vph)	0	465	440	0	0	120
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0	6.0			5.6
Lane Util. Factor		1.00	1.00			1.00
Frbp, ped/bikes		1.00	1.00			0.78
Flpb, ped/bikes		1.00	1.00			1.00
Frt		1.00	1.00			0.86
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		1588	1588			1074
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		1588	1588			1074
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	484	458	0	0	125
RTOR Reduction (vph)	0	0	0	0	0	104
Lane Group Flow (vph)	0	484	458	0	0	21
Confl. Peds. (#/hr)				59		78
Confl. Bikes (#/hr)				14		
Turn Type		NA	NA			Perm
Protected Phases		2 8	4 6			
Permitted Phases						8
Actuated Green, G (s)		54.9	55.1			13.3
Effective Green, g (s)		54.9	55.1			13.3
Actuated g/C Ratio		0.69	0.69			0.17
Clearance Time (s)						5.6
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)		1089	1093			178
v/s Ratio Prot		c0.30	c0.29			
v/s Ratio Perm						0.02
v/c Ratio		0.44	0.42			0.12
Uniform Delay, d1		5.7	5.4			28.4
Progression Factor		0.95	0.15			1.00
Incremental Delay, d2		0.3	0.2			0.3
Delay (s)		5.7	1.0			28.6
Level of Service		A	A			C
Approach Delay (s)		5.7	1.0		28.6	
Approach LOS		A	A		C	
Intersection Summary						
HCM 2000 Control Delay			6.3		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.50			
Actuated Cycle Length (s)			80.0		Sum of lost time (s)	17.6
Intersection Capacity Utilization			95.9%		ICU Level of Service	F
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
9: Hetherton & 4th

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour





















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↖	↑						↑↑↑	↗
Traffic Volume (vph)	0	285	190	80	260	0	0	0	0	135	1046	205
Future Volume (vph)	0	285	190	80	260	0	0	0	0	135	1046	205
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	13	10	15	11	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Lane Util. Factor		1.00	1.00	1.00	1.00						0.91	1.00
Frbp, ped/bikes		1.00	0.93	1.00	1.00						1.00	0.92
Flpb, ped/bikes		1.00	1.00	0.97	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						0.99	1.00
Satd. Flow (prot)		1641	1172	1609	1535						4143	1102
Flt Permitted		1.00	1.00	0.47	1.00						0.99	1.00
Satd. Flow (perm)		1641	1172	792	1535						4143	1102
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	297	198	83	271	0	0	0	0	141	1090	214
RTOR Reduction (vph)	0	0	37	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	297	161	83	271	0	0	0	0	0	1231	214
Confl. Peds. (#/hr)			51	51		28			11	11		19
Confl. Bikes (#/hr)			10			16			1			1
Parking (#/hr)											2	2
Turn Type		NA	Perm	Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases			4	8						2		5
Actuated Green, G (s)		29.8	29.8	29.8	29.8						41.4	34.4
Effective Green, g (s)		29.8	29.8	29.8	29.8						41.4	34.4
Actuated g/C Ratio		0.37	0.37	0.37	0.37						0.52	0.43
Clearance Time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		611	436	295	571						2144	473
v/s Ratio Prot		c0.18			0.18							
v/s Ratio Perm			0.14	0.10							0.30	0.19
v/c Ratio		0.49	0.37	0.28	0.47						0.57	0.45
Uniform Delay, d1		19.2	18.3	17.6	19.1						13.2	16.1
Progression Factor		0.56	0.40	0.93	0.95						0.33	0.47
Incremental Delay, d2		2.5	2.2	2.2	2.6						0.7	2.0
Delay (s)		13.2	9.5	18.5	20.7						5.1	9.7
Level of Service		B	A	B	C						A	A
Approach Delay (s)		11.7			20.2			0.0			5.8	
Approach LOS		B			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group















HCM 2010 Signalized Intersection Summary
10: Irwin & 4th

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	230	0	0	210	90	120	1403	170	0	0	0
Future Volume (veh/h)	180	230	0	0	210	90	120	1403	170	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.95	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1588	1588	0	0	1588	1620	1525	1588	1620			
Adj Flow Rate, veh/h	188	240	0	0	219	83	125	1461	157			
Adj No. of Lanes	1	1	0	0	1	0	1	3	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	262	631	0	0	374	142	722	1976	212			
Arrive On Green	0.13	0.13	0.00	0.00	0.13	0.13	0.16	0.16	0.16			
Sat Flow, veh/h	963	1588	0	0	941	356	1452	3971	427			
Grp Volume(v), veh/h	188	240	0	0	0	302	125	1063	555			
Grp Sat Flow(s),veh/h/ln	963	1588	0	0	0	1297	1452	1445	1507			
Q Serve(g_s), s	14.3	11.1	0.0	0.0	0.0	17.5	5.9	28.0	28.0			
Cycle Q Clear(g_c), s	31.8	11.1	0.0	0.0	0.0	17.5	5.9	28.0	28.0			
Prop In Lane	1.00		0.00	0.00		0.27	1.00		0.28			
Lane Grp Cap(c), veh/h	262	631	0	0	0	516	722	1438	750			
V/C Ratio(X)	0.72	0.38	0.00	0.00	0.00	0.59	0.17	0.74	0.74			
Avail Cap(c_a), veh/h	262	631	0	0	0	516	722	1438	750			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	0.33	0.33	0.33	0.33	0.33			
Upstream Filter(I)	0.87	0.87	0.00	0.00	0.00	1.00	0.35	0.35	0.35			
Uniform Delay (d), s/veh	44.1	25.7	0.0	0.0	0.0	28.6	19.3	28.5	28.5			
Incr Delay (d2), s/veh	13.7	1.5	0.0	0.0	0.0	4.8	0.2	1.2	2.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.2	5.1	0.0	0.0	0.0	7.0	2.4	11.5	12.2			
LnGrp Delay(d),s/veh	57.9	27.3	0.0	0.0	0.0	33.4	19.5	29.7	30.9			
LnGrp LOS	E	C				C	B	C	C			
Approach Vol, veh/h		428			302			1743				
Approach Delay, s/veh		40.7			33.4			29.4				
Approach LOS		D			C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		36.0		44.0		36.0						
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2						
Max Green Setting (Gmax), s		* 32		* 40		* 32						
Max Q Clear Time (g_c+I1), s		33.8		30.0		19.5						
Green Ext Time (p_c), s		0.0		6.0		1.0						
Intersection Summary												
HCM 2010 Ctrl Delay				31.8								
HCM 2010 LOS				C								
Notes												













HCM 2010 Signalized Intersection Summary
11: D & 3rd

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	335	1590	0	0	0	0	0	300	60
Future Volume (veh/h)	0	0	0	335	1590	0	0	0	0	0	300	60
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.94
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.82
Adj Sat Flow, veh/h/ln				1530	1500	0				0	1500	1530
Adj Flow Rate, veh/h				349	1656	0				0	312	43
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				510	2183	0				0	462	63
Arrive On Green				0.23	0.23	0.00				0.00	0.20	0.20
Sat Flow, veh/h				645	3301	0				0	2352	309
Grp Volume(v), veh/h				725	1280	0				0	193	162
Grp Sat Flow(s),veh/h/ln				1339	1242	0				0	1425	1161
Q Serve(g_s), s				40.8	38.4	0.0				0.0	10.0	10.3
Cycle Q Clear(g_c), s				40.8	38.4	0.0				0.0	10.0	10.3
Prop In Lane				0.48		0.00				0.00		0.27
Lane Grp Cap(c), veh/h				986	1707	0				0	289	236
V/C Ratio(X)				0.73	0.75	0.00				0.00	0.67	0.69
Avail Cap(c_a), veh/h				986	1707	0				0	417	339
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				0.45	0.45	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				25.4	24.5	0.0				0.0	29.4	29.5
Incr Delay (d2), s/veh				2.2	1.4	0.0				0.0	2.7	3.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				15.7	13.6	0.0				0.0	4.1	3.5
LnGrp Delay(d),s/veh				27.7	25.9	0.0				0.0	32.1	33.0
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					2005						355	
Approach Delay, s/veh					26.6						32.5	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		59.2		20.8								
Change Period (Y+Rc), s		* 4.2		4.6								
Max Green Setting (Gmax), s		* 48		23.4								
Max Q Clear Time (g_c+I1), s		42.8		12.3								
Green Ext Time (p_c), s		3.9		1.1								
Intersection Summary												
HCM 2010 Ctrl Delay				27.5								
HCM 2010 LOS				C								
Notes												













HCM 2010 Signalized Intersection Summary
12: C & 3rd

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑		↑↑				
Traffic Volume (veh/h)	0	0	0	0	1785	160	150	330	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1785	160	150	330	0	0	0	0
Number				5	2	12	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.98	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1412	1412	1440	1412	0			
Adj Flow Rate, veh/h				0	1859	133	156	344	0			
Adj No. of Lanes				0	3	1	0	2	0			
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %				0	2	2	2	2	0			
Cap, veh/h				0	2481	757	247	442	0			
Arrive On Green				0.00	0.21	0.21	0.08	0.08	0.00			
Sat Flow, veh/h				0	3981	1175	700	1822	0			
Grp Volume(v), veh/h				0	1859	133	270	230	0			
Grp Sat Flow(s),veh/h/ln				0	1285	1175	1237	1220	0			
Q Serve(g_s), s				0.0	36.1	7.4	16.9	14.7	0.0			
Cycle Q Clear(g_c), s				0.0	36.1	7.4	17.3	14.7	0.0			
Prop In Lane				0.00		1.00	0.58		0.00			
Lane Grp Cap(c), veh/h				0	2481	757	382	307	0			
V/C Ratio(X)				0.00	0.75	0.18	0.71	0.75	0.00			
Avail Cap(c_a), veh/h				0	2481	757	408	333	0			
HCM Platoon Ratio				1.00	0.33	0.33	0.33	0.33	1.00			
Upstream Filter(I)				0.00	0.27	0.27	0.74	0.74	0.00			
Uniform Delay (d), s/veh				0.0	25.5	14.1	35.4	34.2	0.0			
Incr Delay (d2), s/veh				0.0	0.6	0.1	3.9	6.3	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	13.0	2.4	6.3	5.5	0.0			
LnGrp Delay(d),s/veh				0.0	26.0	14.3	39.3	40.6	0.0			
LnGrp LOS					C	B	D	D				
Approach Vol, veh/h					1992			500				
Approach Delay, s/veh					25.3			39.9				
Approach LOS					C			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		55.7		24.3								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 50		* 22								
Max Q Clear Time (g_c+I1), s		38.1		19.3								
Green Ext Time (p_c), s		8.0		0.6								
Intersection Summary												
HCM 2010 Ctrl Delay				28.2								
HCM 2010 LOS				C								
Notes												

















HCM 2010 Signalized Intersection Summary
13: B & 3rd

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑						↑↑	
Traffic Volume (veh/h)	0	0	0	195	1850	0	0	0	0	0	290	100
Future Volume (veh/h)	0	0	0	195	1850	0	0	0	0	0	290	100
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.85
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1440	1412	0				0	1412	1440
Adj Flow Rate, veh/h				203	1927	0				0	302	95
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				272	2176	0				0	446	134
Arrive On Green				0.22	0.22	0.00				0.00	0.24	0.24
Sat Flow, veh/h				330	3453	0				0	1904	552
Grp Volume(v), veh/h				786	1344	0				0	217	180
Grp Sat Flow(s),veh/h/ln				1329	1169	0				0	1341	1044
Q Serve(g_s), s				44.3	44.5	0.0				0.0	11.7	12.6
Cycle Q Clear(g_c), s				46.1	44.5	0.0				0.0	11.7	12.6
Prop In Lane				0.26		0.00				0.00		0.53
Lane Grp Cap(c), veh/h				923	1524	0				0	326	254
V/C Ratio(X)				0.85	0.88	0.00				0.00	0.67	0.71
Avail Cap(c_a), veh/h				923	1524	0				0	389	303
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				0.46	0.46	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				29.0	28.4	0.0				0.0	27.3	27.7
Incr Delay (d2), s/veh				4.8	3.8	0.0				0.0	3.3	6.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				18.2	15.3	0.0				0.0	4.6	4.0
LnGrp Delay(d),s/veh				33.8	32.2	0.0				0.0	30.7	33.7
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					2130						397	
Approach Delay, s/veh					32.8						32.0	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		56.4		23.6								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 48		* 23								
Max Q Clear Time (g_c+I1), s		48.1		14.6								
Green Ext Time (p_c), s		0.2		1.1								
Intersection Summary												
HCM 2010 Ctrl Delay				32.6								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary
14: A & 3rd

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	80	1695	100	260	175	0	0	180	50
Future Volume (veh/h)	0	0	0	80	1695	100	260	175	0	0	180	50
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.91	0.96		1.00	1.00		0.91
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1800	1765	1800	1853	1853	0	0	1853	1890
Adj Flow Rate, veh/h				83	1766	96	271	182	0	0	188	38
Adj No. of Lanes				0	3	0	1	1	0	0	1	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				108	2452	137	315	666	0	0	275	56
Arrive On Green				0.53	0.53	0.53	0.03	0.12	0.00	0.00	0.21	0.21
Sat Flow, veh/h				203	4590	257	1765	1853	0	0	1308	264
Grp Volume(v), veh/h				717	597	631	271	182	0	0	0	226
Grp Sat Flow(s),veh/h/ln				1755	1606	1690	1765	1853	0	0	0	1572
Q Serve(g_s), s				25.8	22.0	22.2	5.3	7.2	0.0	0.0	0.0	10.6
Cycle Q Clear(g_c), s				25.8	22.0	22.2	5.3	7.2	0.0	0.0	0.0	10.6
Prop In Lane				0.12		0.15	1.00		0.00	0.00		0.17
Lane Grp Cap(c), veh/h				937	858	903	315	666	0	0	0	330
V/C Ratio(X)				0.77	0.70	0.70	0.86	0.27	0.00	0.00	0.00	0.68
Avail Cap(c_a), veh/h				937	858	903	327	718	0	0	0	364
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	0.73	0.73	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				14.7	13.8	13.9	35.8	25.7	0.0	0.0	0.0	29.2
Incr Delay (d2), s/veh				5.9	4.6	4.5	16.4	0.3	0.0	0.0	0.0	6.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				13.9	10.7	11.3	7.4	3.7	0.0	0.0	0.0	5.2
LnGrp Delay(d),s/veh				20.6	18.5	18.3	52.2	26.1	0.0	0.0	0.0	35.9
LnGrp LOS				C	B	B	D	C				D
Approach Vol, veh/h					1945			453			226	
Approach Delay, s/veh					19.2			41.7			35.9	
Approach LOS					B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			11.5	21.3		47.2		32.8				
Change Period (Y+Rc), s			4.0	4.5		4.5		4.0				
Max Green Setting (Gmax), s			8.0	18.5		40.5		31.0				
Max Q Clear Time (g_c+I1), s			7.3	12.6		27.8		9.2				
Green Ext Time (p_c), s			0.1	0.8		11.1		1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			24.5									
HCM 2010 LOS			C									

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

BioMarin
Cumulative Plus BioMarin Only Conditions
PM Peak Hour

Intersection 15 Brooks St/3rd St Side-street Stop
















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	41	37	90.8%	15.9	7.3	C
	Through	5	3	69.1%	12.7	16.4	B
	Right Turn						
	Subtotal	46	41	88.5%	16.1	6.6	C
SB	Left Turn						
	Through	15	18	122.9%	34.6	12.8	D
	Right Turn	10	9	92.2%	14.7	9.9	B
	Subtotal	25	28	110.6%	29.0	11.6	D
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	65	72	110.5%	3.4	0.4	A
	Through	1,829	1,817	99.4%	3.1	0.6	A
	Right Turn	10	6	61.4%	2.1	0.4	A
	Subtotal	1,904	1,895	99.5%	3.1	0.6	A
Total		1,975	1,964	99.4%	3.7	0.6	A

Intersection 16 Lindero St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	129	129	100.3%	32.3	3.4	C
	Through	20	27	134.4%	34.5	9.3	C
	Right Turn						
	Subtotal	149	156	104.9%	32.7	3.8	C
SB	Left Turn						
	Through	50	50	99.8%	30.4	9.7	C
	Right Turn	10	8	80.6%	18.9	14.5	B
	Subtotal	60	58	96.6%	29.7	8.3	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	242	253	104.7%	9.3	1.4	A
	Through	1,852	1,822	98.4%	8.2	1.5	A
	Right Turn	40	41	102.7%	8.1	3.6	A
	Subtotal	2,134	2,117	99.2%	8.3	1.4	A
Total		2,343	2,331	99.5%	10.6	1.6	B


















HCM 2010 Signalized Intersection Summary
17: Lincoln & 3rd

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	110	1814	150	50	345	0	0	285	160
Future Volume (veh/h)	0	0	0	110	1814	150	50	345	0	0	285	160
Number				1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	0.98		1.00	1.00		0.82
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1620	1588	1620	1620	1588	0	0	1525	1555
Adj Flow Rate, veh/h				115	1890	145	52	359	0	0	297	161
Adj No. of Lanes				0	3	0	0	2	0	0	2	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				132	2293	180	102	668	0	0	536	274
Arrive On Green				0.19	0.19	0.19	0.62	0.62	0.00	0.00	0.10	0.10
Sat Flow, veh/h				229	3984	313	145	2215	0	0	1796	878
Grp Volume(v), veh/h				793	661	696	201	210	0	0	247	211
Grp Sat Flow(s),veh/h/ln				1577	1445	1503	915	1373	0	0	1448	1150
Q Serve(g_s), s				39.1	34.9	35.4	3.9	6.7	0.0	0.0	13.0	14.0
Cycle Q Clear(g_c), s				39.1	34.9	35.4	17.9	6.7	0.0	0.0	13.0	14.0
Prop In Lane				0.14		0.21	0.26		0.00	0.00		0.76
Lane Grp Cap(c), veh/h				908	832	866	342	428	0	0	452	359
V/C Ratio(X)				0.87	0.79	0.80	0.59	0.49	0.00	0.00	0.55	0.59
Avail Cap(c_a), veh/h				936	858	893	342	428	0	0	452	359
HCM Platoon Ratio				0.33	0.33	0.33	2.00	2.00	1.00	1.00	0.33	0.33
Upstream Filter(I)				0.29	0.29	0.29	1.00	1.00	0.00	0.00	0.88	0.88
Uniform Delay (d), s/veh				29.6	27.9	28.1	12.6	11.6	0.0	0.0	30.5	31.0
Incr Delay (d2), s/veh				2.9	1.5	1.6	7.2	4.0	0.0	0.0	4.2	6.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				17.8	14.3	15.2	2.8	2.9	0.0	0.0	5.7	5.1
LnGrp Delay(d),s/veh				32.5	29.4	29.7	19.8	15.6	0.0	0.0	34.7	37.1
LnGrp LOS				C	C	C	B	B			C	D
Approach Vol, veh/h					2150			411			458	
Approach Delay, s/veh					30.6			17.7			35.8	
Approach LOS					C			B			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				29.4		50.6		29.4				
Change Period (Y+Rc), s				4.5		4.5		4.5				
Max Green Setting (Gmax), s				23.5		47.5		23.5				
Max Q Clear Time (g_c+I1), s				19.9		41.1		16.0				
Green Ext Time (p_c), s				0.6		4.9		1.3				
Intersection Summary												
HCM 2010 Ctrl Delay				29.6								
HCM 2010 LOS				C								

HCM Signalized Intersection Capacity Analysis
18: Tamalpais & 3rd


















Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  							
Traffic Volume (vph)	0	0	0	350	1934	50	125	55	0	0	0	0
Future Volume (vph)	0	0	0	350	1934	50	125	55	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1600	1600	1600	1600	1600	1800	1800	1600	1600
Lane Width	12	12	12	12	12	12	11	12	12	12	12	12
Total Lost time (s)					11.6		7.6	7.6				
Lane Util. Factor					0.91		1.00	1.00				
Frbp, ped/bikes					1.00		1.00	1.00				
Flpb, ped/bikes					0.96		0.96	1.00				
Frt					1.00		1.00	1.00				
Flt Protected					0.99		0.95	1.00				
Satd. Flow (prot)					3667		1098	1249				
Flt Permitted					0.99		0.95	1.00				
Satd. Flow (perm)					3667		1098	1249				
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	365	2015	52	130	57	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	2429	0	130	57	0	0	0	0
Confl. Peds. (#/hr)			106	106		44	30		69			30
Confl. Bikes (#/hr)						2			3			8
Parking (#/hr)							3	3			3	3
Turn Type				Perm	NA		Perm	NA				
Protected Phases					6			4				
Permitted Phases				6			4					
Actuated Green, G (s)					51.8		19.0	19.0				
Effective Green, g (s)					51.8		19.0	19.0				
Actuated g/C Ratio					0.58		0.21	0.21				
Clearance Time (s)					11.6		7.6	7.6				
Vehicle Extension (s)					5.0		5.0	5.0				
Lane Grp Cap (vph)					2110		231	263				
v/s Ratio Prot								0.05				
v/s Ratio Perm					0.66		c0.12					
v/c Ratio					1.15		0.56	0.22				
Uniform Delay, d1					19.1		31.8	29.3				
Progression Factor					1.00		1.00	1.00				
Incremental Delay, d2					74.1		5.1	0.9				
Delay (s)					93.2		36.9	30.2				
Level of Service					F		D	C				
Approach Delay (s)		0.0			93.2			34.8			0.0	
Approach LOS		A			F			C			A	
Intersection Summary												
HCM 2000 Control Delay			89.0		HCM 2000 Level of Service			F				
HCM 2000 Volume to Capacity ratio			0.99									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)			19.2				
Intersection Capacity Utilization			163.0%		ICU Level of Service			H				
Analysis Period (min)			15									

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
19: Hetherton & 3rd













Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	510	1728	0	0	0	0	0	725	591
Future Volume (veh/h)	0	0	0	510	1728	0	0	0	0	0	725	591
Number				1	6	16				3	8	18
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.86
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1560	1588	0				0	1588	1500
Adj Flow Rate, veh/h				531	1800	0				0	755	608
Adj No. of Lanes				1	3	0				0	3	1
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				716	2009	0				0	2020	509
Arrive On Green				0.14	0.14	0.00				0.00	0.15	0.15
Sat Flow, veh/h				1486	4765	0				0	4479	1093
Grp Volume(v), veh/h				531	1800	0				0	755	608
Grp Sat Flow(s),veh/h/ln				1486	1588	0				0	1445	1093
Q Serve(g_s), s				27.9	29.7	0.0				0.0	12.5	37.3
Cycle Q Clear(g_c), s				27.9	29.7	0.0				0.0	12.5	37.3
Prop In Lane				1.00		0.00				0.00		1.00
Lane Grp Cap(c), veh/h				716	2009	0				0	2020	509
V/C Ratio(X)				0.74	0.90	0.00				0.00	0.37	1.19
Avail Cap(c_a), veh/h				721	2025	0				0	2020	509
HCM Platoon Ratio				0.33	0.33	1.00				1.00	0.33	0.33
Upstream Filter(l)				0.09	0.09	0.00				0.00	0.83	0.83
Uniform Delay (d), s/veh				31.9	32.7	0.0				0.0	23.4	33.9
Incr Delay (d2), s/veh				0.4	0.6	0.0				0.0	0.4	102.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.6	13.2	0.0				0.0	5.1	25.8
LnGrp Delay(d),s/veh				32.3	33.3	0.0				0.0	23.8	136.5
LnGrp LOS				C	C						C	F
Approach Vol, veh/h					2331						1363	
Approach Delay, s/veh					33.1						74.1	
Approach LOS					C						E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs						6		8				
Phs Duration (G+Y+Rc), s						37.7		42.3				
Change Period (Y+Rc), s						4.0		5.0				
Max Green Setting (Gmax), s						34.0		37.0				
Max Q Clear Time (g_c+I1), s						31.7		39.3				
Green Ext Time (p_c), s						2.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay					48.2							
HCM 2010 LOS					D							
Notes												
User approved volume balancing among the lanes for turning movement.												

User approved ignoring U-Turning movement.




















HCM 2010 Signalized Intersection Summary
20: Irwin & 3rd/3rd St

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑	↑	↑↑↑				
Traffic Volume (veh/h)	0	0	0	0	1235	210	998	1483	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1235	210	998	1483	0	0	0	0
Number				1	6	16	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.93	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1500	1500	1398	1398	0			
Adj Flow Rate, veh/h				0	1286	200	1127	1424	0			
Adj No. of Lanes				0	3	1	2	2	0			
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %				0	2	2	3	3	0			
Cap, veh/h				0	1254	363	1548	1625	0			
Arrive On Green				0.00	0.31	0.31	0.19	0.19	0.00			
Sat Flow, veh/h				0	4230	1184	2663	2796	0			
Grp Volume(v), veh/h				0	1286	200	1127	1424	0			
Grp Sat Flow(s),veh/h/ln				0	1365	1184	1331	1398	0			
Q Serve(g_s), s				0.0	24.5	11.3	31.8	39.6	0.0			
Cycle Q Clear(g_c), s				0.0	24.5	11.3	31.8	39.6	0.0			
Prop In Lane				0.00		1.00	1.00		0.00			
Lane Grp Cap(c), veh/h				0	1254	363	1548	1625	0			
V/C Ratio(X)				0.00	1.03	0.55	0.73	0.88	0.00			
Avail Cap(c_a), veh/h				0	1254	363	1548	1625	0			
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	0.09	0.09	0.00			
Uniform Delay (d), s/veh				0.0	27.8	23.2	26.4	29.5	0.0			
Incr Delay (d2), s/veh				0.0	32.1	1.8	0.3	0.7	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	12.9	3.8	11.8	15.5	0.0			
LnGrp Delay(d),s/veh				0.0	59.8	25.0	26.7	30.2	0.0			
LnGrp LOS					F	C	C	C				
Approach Vol, veh/h					1486			2551				
Approach Delay, s/veh					55.1			28.7				
Approach LOS					E			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				51.0		29.0						
Change Period (Y+Rc), s				4.5		4.5						
Max Green Setting (Gmax), s				46.5		24.5						
Max Q Clear Time (g_c+I1), s				41.6		26.5						
Green Ext Time (p_c), s				4.3		0.0						
Intersection Summary												
HCM 2010 Ctrl Delay				38.4								
HCM 2010 LOS				D								
Notes												













HCM 2010 Signalized Intersection Summary
21: D & 2nd

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  								 		
Traffic Volume (veh/h)	0	1626	110	0	0	0	0	0	435	185	470	0
Future Volume (veh/h)	0	1626	110	0	0	0	0	0	435	185	470	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.96	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1676	1710				0	1588	1620	1765	1765	0
Adj Flow Rate, veh/h	0	1694	106				0	0	439	193	490	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	0	0	0				0	0	575	238	781	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.44	0.15	0.15	0.00
Sat Flow, veh/h		0					0	0	1300	933	1765	0
Grp Volume(v), veh/h		0.0					0	0	439	193	490	0
Grp Sat Flow(s),veh/h/ln							0	0	1300	933	1765	0
Q Serve(g_s), s							0.0	0.0	22.7	12.7	20.9	0.0
Cycle Q Clear(g_c), s							0.0	0.0	22.7	35.4	20.9	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	575	238	781	0
V/C Ratio(X)							0.00	0.00	0.76	0.81	0.63	0.00
Avail Cap(c_a), veh/h							0	0	575	238	781	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	0.74	0.74	0.00
Uniform Delay (d), s/veh							0.0	0.0	18.8	47.0	28.0	0.0
Incr Delay (d2), s/veh							0.0	0.0	5.4	13.7	0.9	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	8.9	5.2	10.4	0.0
LnGrp Delay(d),s/veh							0.0	0.0	24.2	60.7	28.9	0.0
LnGrp LOS									C	E	C	
Approach Vol, veh/h								439			683	
Approach Delay, s/veh								24.2			37.9	
Approach LOS								C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				40.0				40.0				
Change Period (Y+Rc), s				4.6				4.6				
Max Green Setting (Gmax), s				35.4				35.4				
Max Q Clear Time (g_c+I1), s				37.4				24.7				
Green Ext Time (p_c), s				0.0				1.1				
Intersection Summary												
HCM 2010 Ctrl Delay				32.5								
HCM 2010 LOS				C								




















HCM 2010 Signalized Intersection Summary
22: C & 2nd

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑↑				
Traffic Volume (veh/h)	200	2051	0	0	0	0	0	260	120	0	0	0
Future Volume (veh/h)	200	2051	0	0	0	0	0	260	120	0	0	0
Number	1	6	16				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1440	1500	0				0	1500	1440			
Adj Flow Rate, veh/h	208	2136	0				0	271	117			
Adj No. of Lanes	0	3	0				0	2	0			
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0				0	2	2			
Cap, veh/h	299	2663	0				0	376	157			
Arrive On Green	0.23	0.23	0.00				0.00	0.19	0.19			
Sat Flow, veh/h	346	3798	0				0	1992	833			
Grp Volume(v), veh/h	818	1526	0				0	202	186			
Grp Sat Flow(s),veh/h/ln	1414	1365	0				0	1500	1325			
Q Serve(g_s), s	42.0	42.1	0.0				0.0	10.1	10.6			
Cycle Q Clear(g_c), s	44.0	42.1	0.0				0.0	10.1	10.6			
Prop In Lane	0.25		0.00				0.00		0.63			
Lane Grp Cap(c), veh/h	1048	1914	0				0	283	250			
V/C Ratio(X)	0.78	0.80	0.00				0.00	0.71	0.74			
Avail Cap(c_a), veh/h	1048	1914	0				0	390	344			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(l)	0.37	0.37	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	26.0	25.4	0.0				0.0	30.4	30.6			
Incr Delay (d2), s/veh	2.2	1.3	0.0				0.0	7.2	9.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	17.9	16.3	0.0				0.0	4.7	4.6			
LnGrp Delay(d),s/veh	28.2	26.7	0.0				0.0	37.6	40.4			
LnGrp LOS	C	C						D	D			
Approach Vol, veh/h		2344						388				
Approach Delay, s/veh		27.2						39.0				
Approach LOS		C						D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				19.3		60.7						
Change Period (Y+Rc), s				* 4.2		4.6						
Max Green Setting (Gmax), s				* 21		50.4						
Max Q Clear Time (g_c+I1), s				12.6		46.0						
Green Ext Time (p_c), s				2.0		4.3						
Intersection Summary												
HCM 2010 Ctrl Delay			28.9									
HCM 2010 LOS			C									
Notes												

















HCM 2010 Signalized Intersection Summary
23: B & 2nd

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  										
Traffic Volume (veh/h)	0	2086	90	0	0	0	0	0	250	210	290	0
Future Volume (veh/h)	0	2086	90	0	0	0	0	0	250	210	290	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.90	0.97		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1500	1382				0	1588	1591	1560	1500	0
Adj Flow Rate, veh/h	0	2173	88				0	0	243	219	302	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	0	0	0				0	0	359	205	441	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.29	0.10	0.10	0.00
Sat Flow, veh/h		0					0	0	1221	974	1500	0
Grp Volume(v), veh/h		0.0					0	0	243	219	302	0
Grp Sat Flow(s),veh/h/ln							0	0	1221	974	1500	0
Q Serve(g_s), s							0.0	0.0	14.0	9.5	15.6	0.0
Cycle Q Clear(g_c), s							0.0	0.0	14.0	23.5	15.6	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	359	205	441	0
V/C Ratio(X)							0.00	0.00	0.68	1.07	0.69	0.00
Avail Cap(c_a), veh/h							0	0	359	205	441	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	0.68	0.68	0.00
Uniform Delay (d), s/veh							0.0	0.0	24.9	45.2	32.5	0.0
Incr Delay (d2), s/veh							0.0	0.0	4.2	70.9	2.5	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	5.1	8.6	6.8	0.0
LnGrp Delay(d),s/veh							0.0	0.0	29.1	116.1	35.1	0.0
LnGrp LOS									C	F	D	
Approach Vol, veh/h								243			521	
Approach Delay, s/veh								29.1			69.1	
Approach LOS								C			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				28.0				28.0				
Change Period (Y+Rc), s				4.5				4.5				
Max Green Setting (Gmax), s				23.5				23.5				
Max Q Clear Time (g_c+I1), s				25.5				16.0				
Green Ext Time (p_c), s				0.0				0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			56.4									
HCM 2010 LOS			E									

HCM 2010 Signalized Intersection Summary
24: A & 2nd

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	2251	185	0	0	0	0	335	30	120	140	0
Future Volume (veh/h)	110	2251	185	0	0	0	0	335	30	120	140	0
Number	5	2	12				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96				1.00		0.90	0.96		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1765	1800				0	1676	1710	1676	1744	0
Adj Flow Rate, veh/h	115	2345	182				0	349	23	125	146	0
Adj No. of Lanes	0	3	0				0	2	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	134	2881	227				0	516	34	161	431	0
Arrive On Green	0.21	0.21	0.21				0.00	0.17	0.17	0.01	0.08	0.00
Sat Flow, veh/h	208	4483	353				0	3096	197	1597	1744	0
Grp Volume(v), veh/h	969	804	869				0	183	189	125	146	0
Grp Sat Flow(s),veh/h/ln	1754	1606	1684				0	1593	1616	1597	1744	0
Q Serve(g_s), s	42.6	37.8	39.2				0.0	8.6	8.8	0.0	6.3	0.0
Cycle Q Clear(g_c), s	42.6	37.8	39.2				0.0	8.6	8.8	0.0	6.3	0.0
Prop In Lane	0.12		0.21				0.00		0.12	1.00		0.00
Lane Grp Cap(c), veh/h	1127	1032	1082				0	273	277	161	431	0
V/C Ratio(X)	0.86	0.78	0.80				0.00	0.67	0.68	0.77	0.34	0.00
Avail Cap(c_a), veh/h	1127	1032	1082				0	321	325	164	482	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	0.16	0.16	0.16				0.00	1.00	1.00	0.63	0.63	0.00
Uniform Delay (d), s/veh	28.0	26.2	26.7				0.0	31.0	31.1	38.4	30.6	0.0
Incr Delay (d2), s/veh	1.5	1.0	1.1				0.0	7.0	7.3	15.6	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.1	17.1	18.6				0.0	4.3	4.4	3.5	3.1	0.0
LnGrp Delay(d),s/veh	29.5	27.1	27.8				0.0	38.0	38.4	54.0	31.2	0.0
LnGrp LOS	C	C	C					D	D	D	C	
Approach Vol, veh/h		2642						372			271	
Approach Delay, s/veh		28.2						38.2			41.7	
Approach LOS		C						D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		56.0		24.0			6.1	17.9				
Change Period (Y+Rc), s		4.6		* 4.2			* 4.2	* 4.2				
Max Green Setting (Gmax), s		49.1		* 22			* 2	* 16				
Max Q Clear Time (g_c+I1), s		44.6		8.3			2.0	10.8				
Green Ext Time (p_c), s		4.5		0.8			0.0	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			30.5									
HCM 2010 LOS			C									
Notes												

Intersection 25 Brooks St/2nd St Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	94	96	102.5%	29.9	7.1	D
	Through						
	Right Turn						
	Subtotal	94	96	102.5%	29.9	7.1	D
EB	Left Turn	45	40	89.6%	3.1	0.4	A
	Through	2,391	2,383	99.7%	2.7	0.2	A
	Right Turn						
	Subtotal	2,436	2,423	99.5%	2.7	0.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,530	2,519	99.6%	3.8	0.6	A

Intersection 26 Lindaro St/2nd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	89	87	97.5%	18.4	3.4	B
	Right Turn	433	435	100.6%	31.4	8.8	C
	Subtotal	522	522	100.0%	29.3	7.9	C
SB	Left Turn	117	115	98.1%	31.4	11.3	C
	Through	180	195	108.2%	19.3	4.9	B
	Right Turn						
	Subtotal	297	310	104.2%	23.7	6.6	C
EB	Left Turn	60	65	108.2%	20.4	3.5	C
	Through	2,353	2,307	98.1%	19.9	2.4	B
	Right Turn	42	38	91.4%	16.4	3.5	B
	Subtotal	2,455	2,411	98.2%	19.8	2.4	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,274	3,242	99.0%	21.7	2.2	C



















HCM 2010 Signalized Intersection Summary
27: Lincoln & 2nd

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4TTH	T					T	T		4T	
Traffic Volume (veh/h)	235	2547	61	0	0	0	0	210	140	150	190	0
Future Volume (veh/h)	235	2547	61	0	0	0	0	210	140	150	190	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1412	1412				0	1412	1412	1382	1355	0
Adj Flow Rate, veh/h	245	2653	43				0	219	134	156	198	0
Adj No. of Lanes	0	4	1				0	1	1	0	2	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	222	2597	657				0	473	389	246	409	0
Arrive On Green	0.18	0.18	0.18				0.00	0.34	0.34	0.67	0.67	0.00
Sat Flow, veh/h	397	4637	1172				0	1412	1161	477	1281	0
Grp Volume(v), veh/h	859	2039	43				0	219	134	169	185	0
Grp Sat Flow(s),veh/h/ln	1392	1214	1172				0	1412	1161	525	1172	0
Q Serve(g_s), s	44.8	44.8	2.4				0.0	9.8	6.9	15.9	6.1	0.0
Cycle Q Clear(g_c), s	44.8	44.8	2.4				0.0	9.8	6.9	25.6	6.1	0.0
Prop In Lane	0.29		1.00				0.00		1.00	0.92		0.00
Lane Grp Cap(c), veh/h	779	2040	657				0	473	389	262	393	0
V/C Ratio(X)	1.10	1.00	0.07				0.00	0.46	0.34	0.64	0.47	0.00
Avail Cap(c_a), veh/h	779	2040	657				0	473	389	262	393	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	0.09	0.09	0.09				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.6	32.6	15.3				0.0	20.9	20.0	17.5	9.8	0.0
Incr Delay (d2), s/veh	48.2	5.9	0.0				0.0	0.7	0.5	5.3	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	27.7	16.1	0.8				0.0	3.9	2.3	4.0	1.9	0.0
LnGrp Delay(d),s/veh	80.8	38.5	15.4				0.0	21.6	20.5	22.8	10.7	0.0
LnGrp LOS	F	D	B					C	C	C	B	
Approach Vol, veh/h		2941						353			354	
Approach Delay, s/veh		50.5						21.2			16.4	
Approach LOS		D						C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		49.0		31.0				31.0				
Change Period (Y+Rc), s		* 4.2		* 4.2				* 4.2				
Max Green Setting (Gmax), s		* 45		* 27				* 27				
Max Q Clear Time (g_c+I1), s		46.8		11.8				27.6				
Green Ext Time (p_c), s		0.0		1.3				0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			44.4									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary
 28: Francisco W./Tamalpais & 2nd

Cumulative Plus BioMarin Only Conditions
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	2677	120	0	0	0	0	150	370	85	255	0
Future Volume (veh/h)	40	2677	120	0	0	0	0	150	370	85	255	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1412	1412				0	1412	1468	1412	1412	0
Adj Flow Rate, veh/h	42	2789	80				0	156	351	89	266	0
Adj No. of Lanes	0	4	1				0	1	1	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	37	2599	582				0	446	384	254	446	0
Arrive On Green	0.17	0.17	0.17				0.00	0.32	0.32	0.32	0.32	0.00
Sat Flow, veh/h	70	4981	1116				0	1412	1217	710	1412	0
Grp Volume(v), veh/h	845	1986	80				0	156	351	89	266	0
Grp Sat Flow(s),veh/h/ln	1408	1214	1116				0	1412	1217	710	1412	0
Q Serve(g_s), s	41.7	41.7	4.9				0.0	6.8	22.2	8.8	12.7	0.0
Cycle Q Clear(g_c), s	41.7	41.7	4.9				0.0	6.8	22.2	15.6	12.7	0.0
Prop In Lane	0.05		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	735	1901	582				0	446	384	254	446	0
V/C Ratio(X)	1.15	1.05	0.14				0.00	0.35	0.91	0.35	0.60	0.00
Avail Cap(c_a), veh/h	735	1901	582				0	468	403	265	468	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.10	0.10	0.10				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.1	33.1	17.8				0.0	21.1	26.3	27.1	23.1	0.0
Incr Delay (d2), s/veh	68.9	22.3	0.0				0.0	0.5	24.3	0.8	1.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	30.3	17.9	1.5				0.0	2.7	10.0	1.8	5.2	0.0
LnGrp Delay(d),s/veh	102.1	55.4	17.9				0.0	21.5	50.7	27.9	25.0	0.0
LnGrp LOS	F	F	B					C	D	C	C	
Approach Vol, veh/h		2911						507			355	
Approach Delay, s/veh		67.9						41.7			25.7	
Approach LOS		E						D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		48.2		31.8				31.8				
Change Period (Y+Rc), s		6.5		6.5				6.5				
Max Green Setting (Gmax), s		40.5		26.5				26.5				
Max Q Clear Time (g_c+I1), s		43.7		24.2				17.6				
Green Ext Time (p_c), s		0.0		1.1				3.0				
Intersection Summary												
HCM 2010 Ctrl Delay			60.4									
HCM 2010 LOS			E									





















HCM 2010 Signalized Intersection Summary
 29: 101 SBO on Hetherton/Hetherton & 2nd/2nd St

Cumulative Plus BioMarin Only Conditions
 Timing Plan: PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1968	1159	0	0	0	0	0	0	390	845	0
Future Volume (veh/h)	0	1968	1159	0	0	0	0	0	0	390	845	0
Number	5	2	12							7	4	14
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1500	1500							1500	1500	0
Adj Flow Rate, veh/h	0	2050	1176							406	880	0
Adj No. of Lanes	0	3	2							1	2	0
Peak Hour Factor	0.96	0.96	0.96							0.96	0.96	0.96
Percent Heavy Veh, %	0	2	2							2	2	0
Cap, veh/h	0	2303	1305							465	977	0
Arrive On Green	0.00	0.17	0.17							0.11	0.11	0.00
Sat Flow, veh/h	0	4500	2550							1429	3000	0
Grp Volume(v), veh/h	0	2050	1176							406	880	0
Grp Sat Flow(s),veh/h/ln	0	1500	1275							1429	1500	0
Q Serve(g_s), s	0.0	35.6	36.2							22.4	23.2	0.0
Cycle Q Clear(g_c), s	0.0	35.6	36.2							22.4	23.2	0.0
Prop In Lane	0.00		1.00							1.00		0.00
Lane Grp Cap(c), veh/h	0	2303	1305							465	977	0
V/C Ratio(X)	0.00	0.89	0.90							0.87	0.90	0.00
Avail Cap(c_a), veh/h	0	2303	1305							473	994	0
HCM Platoon Ratio	1.00	0.33	0.33							0.33	0.33	1.00
Upstream Filter(l)	0.00	0.09	0.09							0.90	0.90	0.00
Uniform Delay (d), s/veh	0.0	31.0	31.3							34.1	34.4	0.0
Incr Delay (d2), s/veh	0.0	0.6	1.1							14.7	10.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.9	13.0							10.8	11.0	0.0
LnGrp Delay(d),s/veh	0.0	31.6	32.4							48.8	44.5	0.0
LnGrp LOS		C	C							D	D	
Approach Vol, veh/h		3226									1286	
Approach Delay, s/veh		31.9									45.8	
Approach LOS		C									D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		49.4		30.6								
Change Period (Y+Rc), s		8.5		4.5								
Max Green Setting (Gmax), s		40.5		26.5								
Max Q Clear Time (g_c+I1), s		38.2		25.2								
Green Ext Time (p_c), s		2.3		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay			35.9									
HCM 2010 LOS			D									
Notes												
User approved volume balancing among the lanes for turning movement.												






















HCM 2010 Signalized Intersection Summary
30: Irwin & 2nd St

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						  				
Traffic Volume (veh/h)	1013	1395	0	0	0	0	0	1488	600	0	0	0
Future Volume (veh/h)	1013	1395	0	0	0	0	0	1488	600	0	0	0
Number	5	2	12				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.94			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1468	1500	0				0	1412	1412			
Adj Flow Rate, veh/h	1095	1397	0				0	1550	616			
Adj No. of Lanes	2	2	0				0	3	1			
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0				0	2	2			
Cap, veh/h	1501	1418	0				0	1580	464			
Arrive On Green	0.16	0.16	0.00				0.00	0.41	0.41			
Sat Flow, veh/h	2797	3000	0				0	3981	1132			
Grp Volume(v), veh/h	1095	1397	0				0	1550	616			
Grp Sat Flow(s),veh/h/ln	1398	1500	0				0	1285	1132			
Q Serve(g_s), s	30.4	37.2	0.0				0.0	31.8	32.8			
Cycle Q Clear(g_c), s	30.4	37.2	0.0				0.0	31.8	32.8			
Prop In Lane	1.00		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	1501	1418	0				0	1580	464			
V/C Ratio(X)	0.73	0.99	0.00				0.00	0.98	1.33			
Avail Cap(c_a), veh/h	1501	1418	0				0	1580	464			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	30.6	33.5	0.0				0.0	23.3	23.6			
Incr Delay (d2), s/veh	0.3	4.6	0.0				0.0	18.3	161.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	11.8	16.4	0.0				0.0	13.9	31.0			
LnGrp Delay(d),s/veh	30.9	38.1	0.0				0.0	41.6	185.4			
LnGrp LOS	C	D						D	F			
Approach Vol, veh/h		2492						2166				
Approach Delay, s/veh		34.9						82.5				
Approach LOS		C						F				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		42.0		38.0								
Change Period (Y+Rc), s		* 4.2		* 5.2								
Max Green Setting (Gmax), s		* 38		* 33								
Max Q Clear Time (g_c+I1), s		39.2		34.8								
Green Ext Time (p_c), s		0.0		0.0								
Intersection Summary												
HCM 2010 Ctrl Delay			57.0									
HCM 2010 LOS			E									
Notes												

HCM 2010 Signalized Intersection Summary
31: Lindaro & Andersen

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	300	40	80	300	51	70	236	180	102	139	30
Future Volume (veh/h)	20	300	40	80	300	51	70	236	180	102	139	30
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.96	1.00		0.93
Parking Bus, Adj	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 Sat Flow, veh/h/ln	2039	2039	2000	1961	1961	2000	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	21	312	36	83	312	46	73	246	155	106	145	22
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	57	401	46	160	466	69	255	310	195	215	426	65
Arrive On Green	0.03	0.22	0.22	0.09	0.28	0.28	0.14	0.30	0.30	0.12	0.27	0.27
Sat Flow, veh/h	1942	1786	206	1867	1661	245	1774	1050	662	1774	1562	237
Grp Volume(v), veh/h	21	0	348	83	0	358	73	0	401	106	0	167
Grp Sat Flow(s),veh/h/ln	1942	0	1992	1867	0	1906	1774	0	1712	1774	0	1800
Q Serve(g_s), s	0.7	0.0	10.3	2.7	0.0	10.4	2.3	0.0	13.5	3.5	0.0	4.7
Cycle Q Clear(g_c), s	0.7	0.0	10.3	2.7	0.0	10.4	2.3	0.0	13.5	3.5	0.0	4.7
Prop In Lane	1.00		0.10	1.00		0.13	1.00		0.39	1.00		0.13
Lane Grp Cap(c), veh/h	57	0	447	160	0	535	255	0	506	215	0	490
V/C Ratio(X)	0.37	0.00	0.78	0.52	0.00	0.67	0.29	0.00	0.79	0.49	0.00	0.34
Avail Cap(c_a), veh/h	249	0	736	299	0	766	284	0	679	284	0	714
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.8	0.0	22.8	27.3	0.0	19.9	23.9	0.0	20.3	25.7	0.0	18.2
Incr Delay (d2), s/veh	1.5	0.0	3.0	1.0	0.0	1.5	0.2	0.0	4.7	0.7	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	6.0	1.4	0.0	5.7	1.1	0.0	7.0	1.7	0.0	2.4
LnGrp Delay(d),s/veh	31.2	0.0	25.7	28.3	0.0	21.4	24.1	0.0	24.9	26.3	0.0	18.6
LnGrp LOS	C		C	C		C	C		C	C		B
Approach Vol, veh/h		369			441			474			273	
Approach Delay, s/veh		26.1			22.7			24.8			21.6	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.3	18.9	13.0	21.2	5.8	22.4	11.6	22.7				
Change Period (Y+Rc), s	4.0	4.9	4.0	* 4.2	4.0	4.9	4.0	* 4.2				
Max Green Setting (Gmax), s	10.0	23.1	10.0	* 25	8.0	25.1	10.0	* 25				
Max Q Clear Time (g_c+I1), s	4.7	12.3	4.3	6.7	2.7	12.4	5.5	15.5				
Green Ext Time (p_c), s	0.1	1.1	0.0	0.6	0.0	1.2	0.1	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			23.9									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis
 32: Tamalpais & Mission

Cumulative Plus BioMarin Only Conditions
 Timing Plan: PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖		
Traffic Volume (vph)	520	60	0	685	0	0
Future Volume (vph)	520	60	0	685	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0			3.0		
Lane Util. Factor	1.00			1.00		
Frbp, ped/bikes	0.99			1.00		
Flpb, ped/bikes	1.00			1.00		
Frt	0.99			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	1557			1588		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	1557			1588		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	542	62	0	714	0	0
RTOR Reduction (vph)	5	0	0	0	0	0
Lane Group Flow (vph)	600	0	0	714	0	0
Confl. Peds. (#/hr)	10		10		10	
Turn Type	NA			NA		
Protected Phases	2			3 4 6		
Permitted Phases						
Actuated Green, G (s)	36.4			56.5		
Effective Green, g (s)	36.4			50.5		
Actuated g/C Ratio	0.45			0.63		
Clearance Time (s)	6.0					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	708			1002		
v/s Ratio Prot	c0.38			c0.45		
v/s Ratio Perm						
v/c Ratio	0.85			0.71		
Uniform Delay, d1	19.3			9.9		
Progression Factor	0.62			0.37		
Incremental Delay, d2	10.2			0.6		
Delay (s)	22.1			4.3		
Level of Service	C			A		
Approach Delay (s)	22.1			4.3		0.0
Approach LOS	C			A		A

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	94.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
33: Tamalpais & 5th

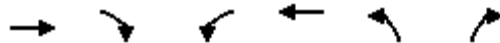
Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↶			↷						↷	↶	
Traffic Volume (vph)	0	500	60	0	330	0	0	0	0	30	20	20	
Future Volume (vph)	0	500	60	0	330	0	0	0	0	30	20	20	
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Total Lost time (s)		6.0			6.0						6.0		
Lane Util. Factor		1.00			1.00						1.00		
Frbp, ped/bikes		0.99			1.00						0.99		
Flpb, ped/bikes		1.00			1.00						1.00		
Frt		0.99			1.00						0.96		
Flt Protected		1.00			1.00						0.98		
Satd. Flow (prot)		1557			1588						1476		
Flt Permitted		1.00			1.00						0.98		
Satd. Flow (perm)		1557			1588						1476		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0	521	62	0	344	0	0	0	0	31	21	21	
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	0	19	0	
Lane Group Flow (vph)	0	580	0	0	344	0	0	0	0	0	54	0	
Confl. Peds. (#/hr)	10		10	10		10	10					10	
Turn Type		NA			NA					Perm	NA		
Protected Phases		2			4	6					8		
Permitted Phases										8			
Actuated Green, G (s)		42.7			58.9						9.1		
Effective Green, g (s)		42.7			58.9						9.1		
Actuated g/C Ratio		0.53			0.74						0.11		
Clearance Time (s)		6.0									6.0		
Vehicle Extension (s)		3.0									1.5		
Lane Grp Cap (vph)		831			1169						167		
v/s Ratio Prot		c0.37			c0.22								
v/s Ratio Perm											0.04		
v/c Ratio		0.70			0.29						0.33		
Uniform Delay, d1		13.9			3.6						32.6		
Progression Factor		0.66			0.06						0.64		
Incremental Delay, d2		3.6			0.0						0.3		
Delay (s)		12.8			0.3						21.2		
Level of Service		B			A						C		
Approach Delay (s)		12.8			0.3			0.0			21.2		
Approach LOS		B			A			A			C		
Intersection Summary													
HCM 2000 Control Delay			9.1									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.59										
Actuated Cycle Length (s)			80.0									Sum of lost time (s)	18.0
Intersection Capacity Utilization			85.5%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 34: Tamalpais & Mission

Cumulative Plus BioMarin Only Conditions
 Timing Plan: PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Traffic Volume (vph)	520	0	0	675	10	20
Future Volume (vph)	520	0	0	675	10	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0			6.0	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.91	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	1588			1588	1420	
Flt Permitted	1.00			1.00	0.98	
Satd. Flow (perm)	1588			1588	1420	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	542	0	0	703	10	21
RTOR Reduction (vph)	0	0	0	0	17	0
Lane Group Flow (vph)	542	0	0	703	14	0
Confl. Peds. (#/hr)		10				
Turn Type	NA			NA	Prot	
Protected Phases	2 8			6	3 4	
Permitted Phases						
Actuated Green, G (s)	54.3			36.4	14.1	
Effective Green, g (s)	48.7			36.4	14.1	
Actuated g/C Ratio	0.61			0.45	0.18	
Clearance Time (s)				6.0		
Vehicle Extension (s)				3.0		
Lane Grp Cap (vph)	966			722	250	
v/s Ratio Prot	c0.34			c0.44	c0.01	
v/s Ratio Perm						
v/c Ratio	0.56			0.97	0.05	
Uniform Delay, d1	9.3			21.3	27.4	
Progression Factor	0.22			1.07	1.94	
Incremental Delay, d2	0.4			22.2	0.0	
Delay (s)	2.4			45.0	53.3	
Level of Service	A			D	D	
Approach Delay (s)	2.4			45.0	53.3	
Approach LOS	A			D	D	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	94.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

Cumulative Plus BioMarin Only Conditions

35: Tamalpais & 5th

Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑			↑				
Traffic Volume (vph)	0	530	0	0	310	10	20	20	20	0	0	0
Future Volume (vph)	0	530	0	0	310	10	20	20	20	0	0	0
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		1.00			1.00			1.00				
Frbp, ped/bikes		1.00			1.00			0.99				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			1.00			0.95				
Flt Protected		1.00			1.00			0.98				
Satd. Flow (prot)		1588			1580			1470				
Flt Permitted		1.00			1.00			0.98				
Satd. Flow (perm)		1588			1580			1470				
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	552	0	0	323	10	21	21	21	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	18	0	0	0	0
Lane Group Flow (vph)	0	552	0	0	332	0	0	45	0	0	0	0
Confl. Peds. (#/hr)	10		10			10			10			
Turn Type		NA			NA		Split	NA				
Protected Phases		2 8			6		4	4				
Permitted Phases												
Actuated Green, G (s)		57.8			42.7			10.2				
Effective Green, g (s)		57.8			42.7			10.2				
Actuated g/C Ratio		0.72			0.53			0.13				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			1.5				
Lane Grp Cap (vph)		1147			843			187				
v/s Ratio Prot		c0.35			0.21			c0.03				
v/s Ratio Perm												
v/c Ratio		0.48			0.39			0.24				
Uniform Delay, d1		4.7			11.0			31.4				
Progression Factor		0.15			0.63			1.16				
Incremental Delay, d2		0.1			1.3			0.2				
Delay (s)		0.8			8.2			36.7				
Level of Service		A			A			D				
Approach Delay (s)		0.8			8.2			36.7			0.0	
Approach LOS		A			A			D			A	
Intersection Summary												
HCM 2000 Control Delay			5.8					HCM 2000 Level of Service		A		
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			80.0					Sum of lost time (s)		18.0		
Intersection Capacity Utilization			85.5%					ICU Level of Service		E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
36: Tamalpais & 4th

Cumulative Plus BioMarin Only Conditions
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑			↑			↑					
Traffic Volume (vph)	0	465	0	0	420	40	20	15	20	0	0	0	
Future Volume (vph)	0	465	0	0	420	40	20	15	20	0	0	0	
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Total Lost time (s)		6.0			6.0			6.0					
Lane Util. Factor		1.00			1.00			1.00					
Frbp, ped/bikes		1.00			0.98			0.99					
Flpb, ped/bikes		1.00			1.00			1.00					
Frt		1.00			0.99			0.95					
Flt Protected		1.00			1.00			0.98					
Satd. Flow (prot)		1588			1546			1469					
Flt Permitted		1.00			1.00			0.98					
Satd. Flow (perm)		1588			1546			1469					
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0	484	0	0	438	42	21	16	21	0	0	0	
RTOR Reduction (vph)	0	0	0	0	4	0	0	17	0	0	0	0	
Lane Group Flow (vph)	0	484	0	0	476	0	0	41	0	0	0	0	
Confl. Peds. (#/hr)	59		21			59			10				
Turn Type		NA			NA		Split	NA					
Protected Phases		2 8			6		4	4					
Permitted Phases													
Actuated Green, G (s)		54.9			35.6			13.5					
Effective Green, g (s)		54.9			35.6			13.5					
Actuated g/C Ratio		0.69			0.45			0.17					
Clearance Time (s)					6.0			6.0					
Vehicle Extension (s)					3.0			3.0					
Lane Grp Cap (vph)		1089			687			247					
v/s Ratio Prot		c0.30			c0.31			c0.03					
v/s Ratio Perm													
v/c Ratio		0.44			0.69			0.16					
Uniform Delay, d1		5.7			17.8			28.4					
Progression Factor		0.18			0.62			1.02					
Incremental Delay, d2		0.3			5.1			0.2					
Delay (s)		1.3			16.2			29.3					
Level of Service		A			B			C					
Approach Delay (s)		1.3			16.2			29.3			0.0		
Approach LOS		A			B			C			A		
Intersection Summary													
HCM 2000 Control Delay			9.9									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.54										
Actuated Cycle Length (s)			80.0									Sum of lost time (s)	17.6
Intersection Capacity Utilization			95.9%									ICU Level of Service	F
Analysis Period (min)			15										
c Critical Lane Group													

Arterial Level of Service: EB 2nd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
D	IV	25	18.1	36.0	54.1	0.07	4.5	F
C	IV	25	18.9	8.9	27.8	0.07	9.2	D
B	IV	25	17.9	30.8	48.7	0.07	5.0	F
A	IV	25	18.5	9.6	28.1	0.07	8.9	E
Lindaro	IV	25	25.3	39.2	64.5	0.14	7.8	E
Lincoln	IV	25	21.4	44.8	66.2	0.10	5.3	F
Francisco W.	IV	25	12.2	69.3	81.5	0.05	2.0	F
101 SBO on 2nd	IV	25	14.2	11.6	25.8	0.05	7.5	E
Total	IV		146.5	250.2	396.7	0.61	5.6	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	99.7	118.7	0.07	2.2	F
Tamalpais	IV	25	14.4	98.0	112.4	0.05	1.7	F
Lincoln	IV	25	13.2	73.6	86.8	0.05	2.1	F
Lindaro	IV	25	21.4	1.1	22.5	0.10	15.6	C
A	IV	25	19.5	10.0	29.5	0.07	9.0	E
B	IV	25	17.9	9.3	27.2	0.07	8.9	E
C	IV	25	19.0	3.6	22.6	0.07	11.4	D
D	IV	25	18.7	1.7	20.4	0.07	12.4	D
Total	IV		143.1	297.0	440.1	0.56	4.6	F

Arterial Level of Service: SB Hetherton

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Mission	IV	29	24.0	21.3	45.3	0.16	12.7	D
5th	IV	25	16.3	12.8	29.1	0.06	7.6	E
4th	IV	25	14.6	7.5	22.1	0.05	8.9	E
3rd	IV	25	17.7	7.6	25.3	0.07	9.5	D
2nd	IV	25	15.6	261.4	277.0	0.06	0.8	F
Total	IV		88.2	310.6	398.8	0.40	3.6	F

Arterial Level of Service: NB Irwin

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
2nd St	IV	30	25.2	82.0	107.2	0.17	5.6	F
3rd St	IV	25	14.8	26.7	41.5	0.06	4.8	F
4th	IV	25	18.3	30.3	48.6	0.07	5.1	F
5th	IV	25	14.6	8.4	23.0	0.06	8.6	E
Mission	IV	25	15.7	6.8	22.5	0.06	9.5	D
Total	IV		88.6	154.2	242.8	0.41	6.0	F

Arterial Level of Service: EB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lincoln	IV	25	28.5	15.7	44.2	0.16	12.9	D
Tamalpais	IV	25	16.0	52.8	68.8	0.06	3.2	F
Tamalpais	IV	25	3.1	2.9	6.0	0.01	7.0	E
Hetherton	IV	25	8.7	21.6	30.3	0.03	3.9	F
Irwin	IV	25	18.9	12.1	31.0	0.07	8.3	E
Total	IV		75.2	105.1	180.3	0.33	6.7	F

Arterial Level of Service: WB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Irwin	IV	25	21.6	26.8	48.4	0.10	7.3	E
Hetherton	IV	25	18.9	36.1	55.0	0.07	4.7	F
Tamalpais	IV	25	8.7	82.6	91.3	0.03	1.3	F
Tamalpais	IV	25	3.1	3.7	6.8	0.01	6.2	F
Lincoln	IV	25	16.0	88.7	104.7	0.06	2.1	F
Total	IV		68.3	237.9	306.2	0.27	3.2	F

Arterial Level of Service: EB 2nd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
D	IV	25	18.1	24.8	42.9	0.07	5.7	F
C	IV	25	18.9	8.4	27.3	0.07	9.4	D
B	IV	25	17.9	18.9	36.8	0.07	6.6	F
A	IV	25	18.5	9.7	28.2	0.07	8.9	E
Lindaro	IV	25	25.3	51.0	76.3	0.14	6.6	F
Lincoln	IV	25	21.4	24.2	45.6	0.10	7.7	E
Francisco W.	IV	25	12.2	86.3	98.5	0.05	1.7	F
101 SBO on Hetherton	IV	25	14.2	80.5	94.7	0.05	2.0	F
Total	IV		146.5	303.8	450.3	0.61	4.9	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	93.3	112.3	0.07	2.3	F
Tamalpais	IV	25	14.4	95.0	109.4	0.05	1.8	F
Lincoln	IV	25	13.2	18.5	31.7	0.05	5.7	F
Lindaro	IV	25	21.4	3.7	25.1	0.10	14.0	C
A	IV	25	19.5	10.9	30.4	0.07	8.7	E
B	IV	25	17.9	10.2	28.1	0.07	8.6	E
C	IV	25	19.0	4.4	23.4	0.07	11.0	D
D	IV	25	18.7	3.9	22.6	0.07	11.2	D
Total	IV		143.1	239.9	383.0	0.56	5.2	F

Arterial Level of Service: SB Hetherton

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Mission	IV	35	22.2	20.6	42.8	0.16	13.4	C
5th	IV	25	16.3	17.3	33.6	0.06	6.6	F
4th	IV	25	14.6	5.2	19.8	0.05	10.0	D
3rd	IV	25	17.7	21.9	39.6	0.07	6.1	F
2nd	IV	25	15.6	54.2	69.8	0.06	3.0	F
Total	IV		86.4	119.2	205.6	0.40	7.0	E

Arterial Level of Service: NB Irwin

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
2nd St	IV	38	19.3	43.2	62.5	0.17	9.7	D
3rd St	IV	25	14.8	12.7	27.5	0.06	7.3	E
4th	IV	25	18.9	12.1	31.0	0.07	8.3	E
5th	IV	25	14.0	14.2	28.2	0.05	6.7	F
Mission	IV	25	15.7	3.4	19.1	0.06	11.2	D
Total	IV		82.7	85.6	168.3	0.41	8.7	E

Arterial Level of Service: EB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lincoln	IV	25	28.5	12.8	41.3	0.16	13.8	C
Tamalpais	IV	25	16.1	24.0	40.1	0.06	5.5	F
Tamalpais	IV	25	4.3	2.3	6.6	0.02	8.9	E
Hetherton	IV	25	7.5	15.1	22.6	0.03	4.5	F
Irwin	IV	25	18.9	14.1	33.0	0.07	7.8	E
Total	IV		75.3	68.3	143.6	0.33	8.4	E

Arterial Level of Service: WB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Irwin	IV	25	21.6	28.4	50.0	0.10	7.1	E
Hetherton	IV	25	18.9	13.8	32.7	0.07	7.8	E
Tamalpais	IV	25	7.5	47.5	55.0	0.03	1.8	F
Tamalpais	IV	25	4.3	2.7	7.0	0.02	8.4	E
Lincoln	IV	25	16.1	88.2	104.3	0.06	2.1	F
Total	IV		68.4	180.6	249.0	0.27	4.0	F

Leisch Method for Weaving Analysis

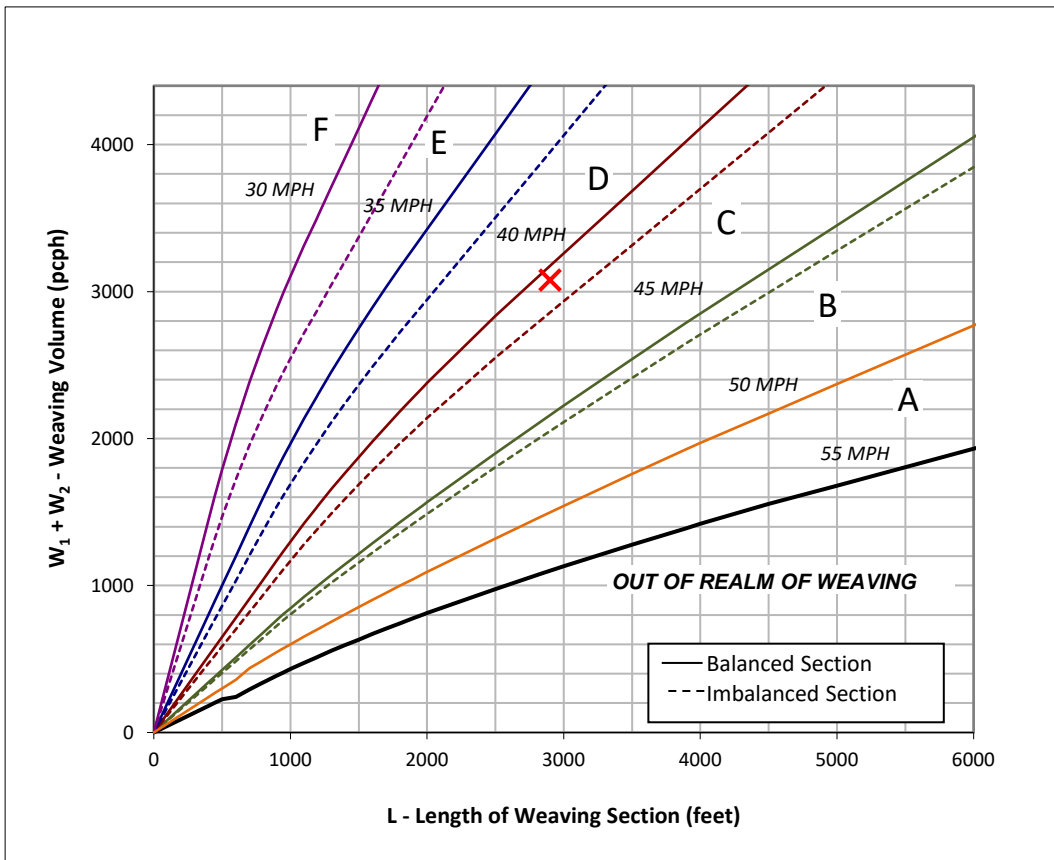
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	5
Length of Weaving Section (feet)	L	2,900

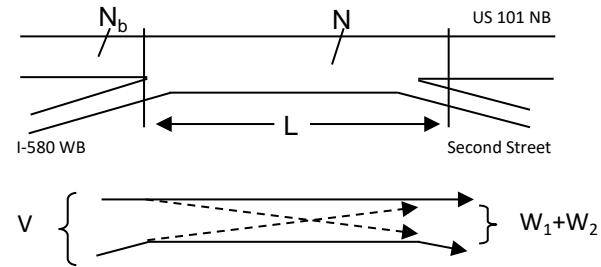
Project Information

Project	BioMarin
Scenario	Cumulative Plus Project No CS AM PH
Freeway	US 101 NB
On-ramp	I-580 WB
Off-ramp	Second Street

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	6,036	Volume (vph)*	1,951	Volume (vph)*	1,000
Truck Percentage	4%	Truck Percentage	4%	Truck Percentage	4%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	2.0
Volume (pcph)	6,302	Volume (pcph)	2,037	Volume (pcph)	1,041



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
40 MPH and 45 MPH
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 38.6
- Weaving Intensity Factor (k) 2.61
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,595
- Level of Service (LOS) D

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.
 * Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.
 Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Cumulative Plus Project No Senior Center Conditions
Project Description	BioMarin - US 101 NB Second Street to Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	4150	Heavy Vehicle Adjustment Factor (f_{HV})	0.919
Peak Hour Factor (PHF)	0.99	Flow Rate ($v_{p,GP}$), pc/h/ln	1520
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.66
Passenger Car Equivalent (E_T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	25.3
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000

Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V_{ML}), veh/h	718	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	820
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.50
Passenger Car Equivalent (E_T)	3.000		
Managed Lane Speed and Density			
Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.8
Speed 2 (S_2), mi/h	0.2	Density (D_{ML}), pc/mi/ln	13.7
Speed 2 (S_3), mi/h	1.4	Level of Service (LOS)	B

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Cumulative Plus Project No Senior Center Conditions
Project Description	BioMarin - US 101 NB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	4	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	2.86
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	1.02
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	6021	Heavy Vehicle Adjustment Factor (f_{HV})	0.889
Peak Hour Factor (PHF)	0.99	Flow Rate ($v_{p,GP}$), pc/h/ln	1710
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.74
Passenger Car Equivalent (E_T)	3.840		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	59.8
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	28.6
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	2.86

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000

Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V_{ML}), veh/h	1039	Heavy Vehicle Adjustment Factor (f_{HV})	0.916
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1246
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.76
Passenger Car Equivalent (E_T)	5.597		
Managed Lane Speed and Density			
Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	58.3
Speed 2 (S_2), mi/h	1.7	Density (D_{ML}), pc/mi/ln	21.4
Speed 2 (S_3), mi/h	7.7	Level of Service (LOS)	C

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	4/24/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Cumulative Plus Project No Senior Center Conditions
Project Description	BioMarin - US 101 SB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	-2.44
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	0.77
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	6275	Heavy Vehicle Adjustment Factor (f_{HV})	0.951
Peak Hour Factor (PHF)	0.97	Flow Rate ($v_{p,GP}$), pc/h/ln	2267
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.99
Passenger Car Equivalent (E_T)	2.180		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	51.9
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	43.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000

Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V_{ML}), veh/h	1317	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.94	Flow Rate ($V_{p,ML}$), pc/h/ln	1440
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (E_T)	2.390		
Managed Lane Speed and Density			
Breakpoint (BP_{ML})	501	Indicator Variable	1
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	44.8
Speed 2 (S_2), mi/h	3.0	Density (D_{ML}), pc/mi/ln	32.1
Speed 2 (S_3), mi/h	12.2	Level of Service (LOS)	D

HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	3/17/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Cumulative Plus Project No Senior Center Conditions
Project Description	BioMarin - US 101 Mission Ave Slip Off-Ramp		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	3	1
Free-Flow Speed (FFS), mi/h	60.0	50.0
Segment Length (L) / Deceleration Length (L _D), ft	1500	170
Terrain Type	Specific Grade	Specific Grade
Percent Grade, %	-2.44	-1.80
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Volume (V _i), veh/h	6275	2047
Peak Hour Factor (PHF)	0.97	0.92
Total Trucks, %	4.40	3.72
Single-Unit Trucks (SUT), %	66	66
Tractor-Trailers (TT), %	34	34
Heavy Vehicle Adjustment Factor (f _{HV})	0.951	0.958
Flow Rate (v _i), pc/h	6802	2323
Capacity (c), pc/h	6900	2100
Volume-to-Capacity Ratio (v/c)	0.99	1.11

Speed and Density

Upstream Equilibrium Distance (L _{EQ}), ft	111476.2	Density in Ramp Influence Area (D _R), pc/mi/ln	-
Distance to Upstream Ramp (L _{UP}), ft	10000	Speed Index (D _S)	-
Downstream Equilibrium Distance (L _{EQ}), ft	-	Flow Outer Lanes (v _{OA}), pc/h/ln	2316
Distance to Downstream Ramp (L _{DOWN}), ft	10000	Off-Ramp Influence Area Speed (S _R), mi/h	-
Prop. Freeway Vehicles in Lane 1 and 2 (P _{FD})	0.483	Outer Lanes Freeway Speed (S _O), mi/h	60.7
Flow in Lanes 1 and 2 (v ₁₂), pc/h	4486	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (v _{R12}), pc/h	-	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F		

Managed Lane Geometric Data			
Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, ln	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44
Managed Lane Adjustment Factors			
Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V_{ML}), veh/h	1317	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.94	Flow Rate ($V_{p,ML}$), pc/h/ln	1440
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (E _t)	2.390		
Managed Lane Speed and Density			
Breakpoint (BP _{ML})	501	Indicator Variable	1
Speed 1 (S ₁), mi/h	60.0	Average Speed (S _{ML}), mi/h	44.8
Speed 2 (S ₂), mi/h	3.0	Density (D _{ML}), pc/mi/ln	32.1
Speed 2 (S ₃), mi/h	12.2	Level of Service (LOS)	D

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Cumulative Plus Project No Senior Center Conditions
Project Description	BioMarin - US 101 SB Mission Avenue to Second Street		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	4234	Heavy Vehicle Adjustment Factor (f_{HV})	0.919
Peak Hour Factor (PHF)	0.97	Flow Rate ($v_{p,GP}$), pc/h/ln	1583
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.69
Passenger Car Equivalent (E_T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	26.4
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000

Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V_{ML}), veh/h	998	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.94	Flow Rate ($V_{p,ML}$), pc/h/ln	1104
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.67
Passenger Car Equivalent (E_T)	3.000		
Managed Lane Speed and Density			
Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.0
Speed 2 (S_2), mi/h	1.0	Density (D_{ML}), pc/mi/ln	18.7
Speed 2 (S_3), mi/h	5.0	Level of Service (LOS)	C

Leisch Method for Weaving Analysis

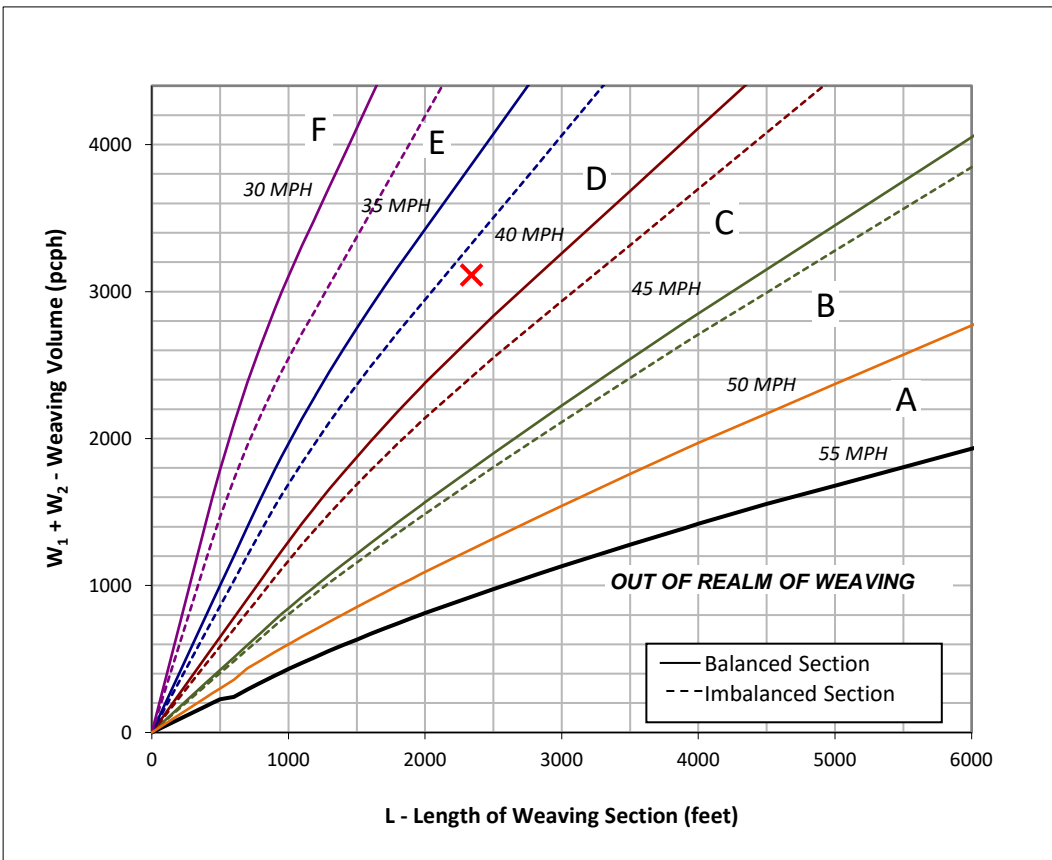
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	2,340

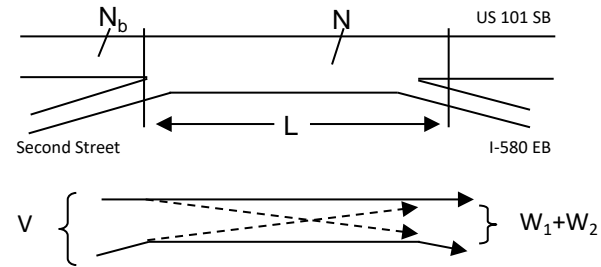
Project Information

Project	BioMarin
Scenario	Cumulative Plus Project No SenCent PM PH
Freeway	US 101 SB
On-ramp	Second Street
Off-ramp	I-580 EB

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	6,720	Volume (vph)*	1,767	Volume (vph)*	1,225
Truck Percentage	4%	Truck Percentage	3%	Truck Percentage	2%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	4.1
Volume (pcph)	7,016	Volume (pcph)	1,814	Volume (pcph)	1,298



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
35 MPH and 40 MPH
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 38.2
- Weaving Intensity Factor (k) 2.63
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 2,284
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

Leisch Method for Weaving Analysis

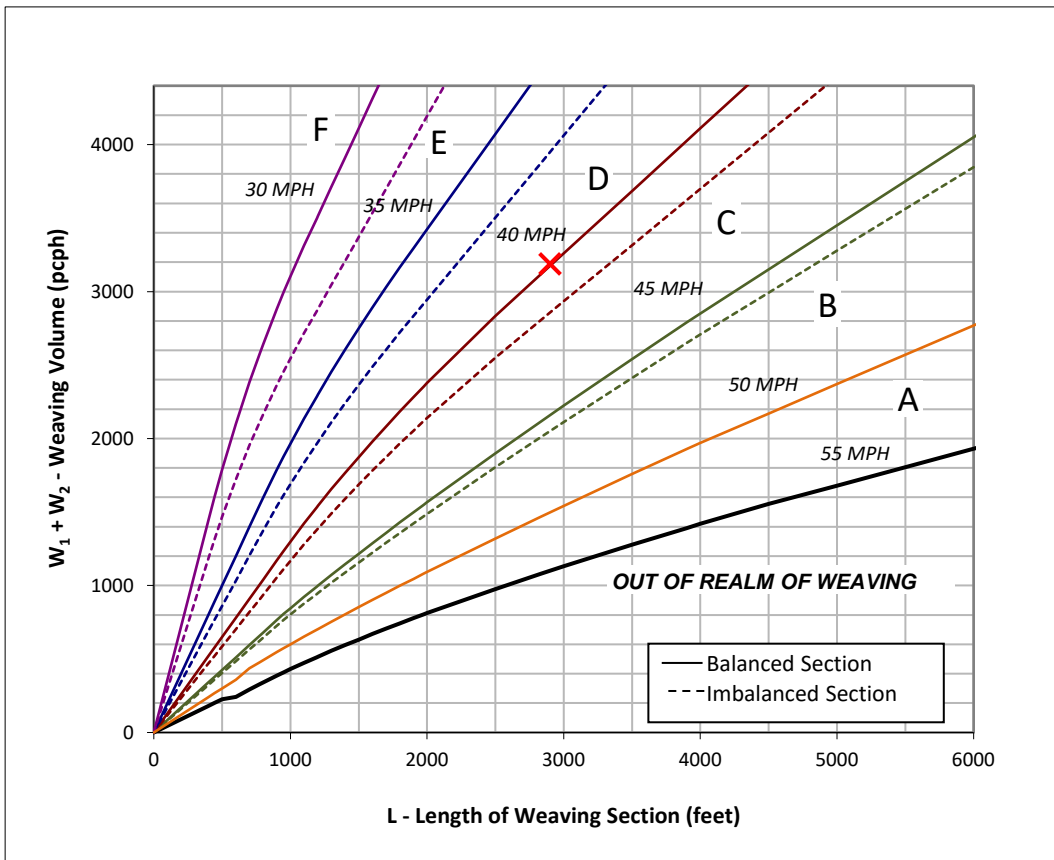
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	5
Length of Weaving Section (feet)	L	2,900

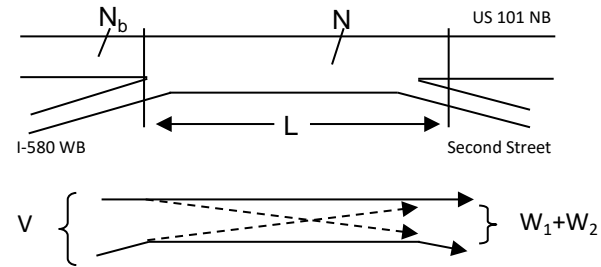
Project Information

Project	BioMarin
Scenario	Cumulative Plus Project PM Peak Hour
Freeway	US 101 NB
On-ramp	I-580 WB
Off-ramp	Second Street

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	7,257	Volume (vph)*	1,661	Volume (vph)*	1,417
Truck Percentage	4%	Truck Percentage	4%	Truck Percentage	3%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	2.0
Volume (pcph)	7,576	Volume (pcph)	1,734	Volume (pcph)	1,454



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? **N**
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
35 MPH and **40 MPH**
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) **38.5**
- Weaving Intensity Factor (k) **2.62**
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ **1,985**
- Level of Service (LOS) **F**

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Cumulative + Project No Senior Center Conditions
Project Description	BioMarin - US 101 NB Second Street to Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	5170	Heavy Vehicle Adjustment Factor (f_{HV})	0.919
Peak Hour Factor (PHF)	0.98	Flow Rate ($v_{p,GP}$), pc/h/ln	1913
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.83
Passenger Car Equivalent (E_T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	58.2
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	32.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	848	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.99	Flow Rate ($V_{p,ML}$), pc/h/ln	890
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.54
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.7
Speed 2 (S_2), mi/h	0.3	Density (D_{ML}), pc/mi/ln	14.9
Speed 2 (S_3), mi/h	2.1	Level of Service (LOS)	B

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Cumulative Plus Project No Senior Center Conditions
Project Description	BioMarin - US 101 NB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	4	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	2.86
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	1.02
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	6021	Heavy Vehicle Adjustment Factor (f_{HV})	0.889
Peak Hour Factor (PHF)	0.99	Flow Rate ($v_{p,GP}$), pc/h/ln	1710
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.74
Passenger Car Equivalent (E_T)	3.840		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	59.8
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	28.6
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	2.86

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000

Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V_{ML}), veh/h	1039	Heavy Vehicle Adjustment Factor (f_{HV})	0.916
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1246
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.76
Passenger Car Equivalent (E_T)	5.597		
Managed Lane Speed and Density			
Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	58.3
Speed 2 (S_2), mi/h	1.7	Density (D_{ML}), pc/mi/ln	21.4
Speed 2 (S_3), mi/h	7.7	Level of Service (LOS)	C

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	4/24/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Cumulative Plus Project No Senior Center Conditions
Project Description	BioMarin - US 101 SB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	-2.44
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	0.77
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	5442	Heavy Vehicle Adjustment Factor (f_{HV})	0.951
Peak Hour Factor (PHF)	0.97	Flow Rate ($v_{p,GP}$), pc/h/ln	1966
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.85
Passenger Car Equivalent (E_T)	2.180		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	57.6
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	34.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1377	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1555
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.94
Passenger Car Equivalent (E_T)	2.390		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	56.0
Speed 2 (S_2), mi/h	4.0	Density (D_{ML}), pc/mi/ln	27.8
Speed 2 (S_3), mi/h	15.4	Level of Service (LOS)	D

HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	4/24/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Cumulative Plus Project No Senior Center Conditions
Project Description	BioMarin - US 101 Mission Ave Slip Off-Ramp		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	3	1
Free-Flow Speed (FFS), mi/h	60.0	50.0
Segment Length (L) / Deceleration Length (L _D), ft	1500	170
Terrain Type	Specific Grade	Specific Grade
Percent Grade, %	-2.44	-1.80
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Volume (V _i), veh/h	5442	2080
Peak Hour Factor (PHF)	0.97	0.96
Total Trucks, %	4.40	2.00
Single-Unit Trucks (SUT), %	66	66
Tractor-Trailers (TT), %	34	34
Heavy Vehicle Adjustment Factor (f _{HV})	0.951	0.973
Flow Rate (v _i), pc/h	5899	2227
Capacity (c), pc/h	6900	2100
Volume-to-Capacity Ratio (v/c)	0.85	1.06

Speed and Density

Upstream Equilibrium Distance (L _{EQ}), ft	151607.6	Density in Ramp Influence Area (D _R), pc/mi/ln	-
Distance to Upstream Ramp (L _{UP}), ft	10000	Speed Index (D _S)	-
Downstream Equilibrium Distance (L _{EQ}), ft	-	Flow Outer Lanes (v _{OA}), pc/h/ln	1799
Distance to Downstream Ramp (L _{DOWN}), ft	10000	Off-Ramp Influence Area Speed (S _R), mi/h	-
Prop. Freeway Vehicles in Lane 1 and 2 (P _{FD})	0.510	Outer Lanes Freeway Speed (S _O), mi/h	62.7
Flow in Lanes 1 and 2 (v ₁₂), pc/h	4100	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (v _{R12}), pc/h	-	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F		

Managed Lane Geometric Data			
Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, ln	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44
Managed Lane Adjustment Factors			
Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V_{ML}), veh/h	1380	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1559
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.94
Passenger Car Equivalent (E _t)	2.390		
Managed Lane Speed and Density			
Breakpoint (BP _{ML})	501	Indicator Variable	1
Speed 1 (S ₁), mi/h	60.0	Average Speed (S _{ML}), mi/h	40.4
Speed 2 (S ₂), mi/h	4.1	Density (D _{ML}), pc/mi/ln	38.6
Speed 2 (S ₃), mi/h	15.5	Level of Service (LOS)	E

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Cumulative Plus Project No Senior Center Conditions
Project Description	BioMarin - US 101 SB Mission Avenue to Second Street		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	3369	Heavy Vehicle Adjustment Factor (f_{HV})	0.919
Peak Hour Factor (PHF)	0.97	Flow Rate ($v_{p,GP}$), pc/h/ln	1260
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.55
Passenger Car Equivalent (E_T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	21.0
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V _{ML}), veh/h	918	Heavy Vehicle Adjustment Factor (f _{HV})	0.962
Peak Hour Factor	0.91	Flow Rate (V _{p,ML}), pc/h/ln	1049
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c _{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.64
Passenger Car Equivalent (E _t)	3.000		

Managed Lane Speed and Density

Breakpoint (BP _{ML})	501	Indicator Variable	0
Speed 1 (S ₁), mi/h	60.0	Average Speed (S _{ML}), mi/h	59.2
Speed 2 (S ₂), mi/h	0.8	Density (D _{ML}), pc/mi/ln	17.7
Speed 2 (S ₃), mi/h	4.2	Level of Service (LOS)	B

Leisch Method for Weaving Analysis

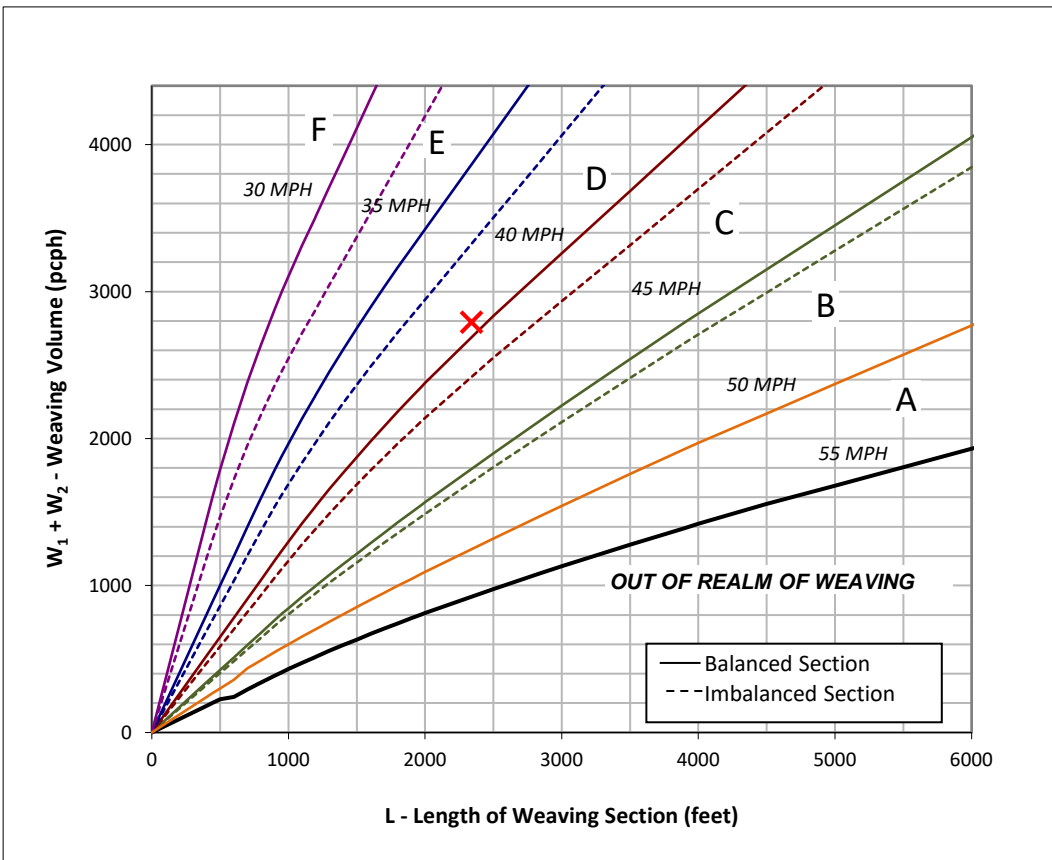
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	2,340

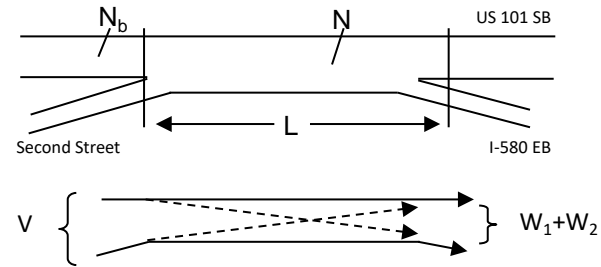
Project Information

Project	BioMarin
Scenario	Cumulative Plus Project No SenCent PM PH
Freeway	US 101 SB
On-ramp	Second Street
Off-ramp	I-580 EB

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	5,432	Volume (vph)*	1,180	Volume (vph)*	1,442
Truck Percentage	4%	Truck Percentage	3%	Truck Percentage	3%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	4.1
Volume (pcph)	5,671	Volume (pcph)	1,210	Volume (pcph)	1,582



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
35 MPH and 40 MPH
 If left of the 30 MPH curve, LOS is F. Select "-".
 If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 39.6
- Weaving Intensity Factor (k) 2.55
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,886
- Level of Service (LOS) E

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

Appendix G: Cumulative Plus Project Conditions (R&D and Senior Services and Housing) – Technical Calculations

Transportation Impact Study




















for BioMarin 999 3rd Street

San Rafael Campus Expansion

January 23, 2019

HCM 2010 Signalized Intersection Summary
1: Lincoln & Mission

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	500	20	80	585	50	20	230	90	60	421	380
Future Volume (veh/h)	120	500	20	80	585	50	20	230	90	60	421	380
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	0.99		0.97	0.99		0.94	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1660	1660	1710	1660	1660	1710	1800	1678	1728	1800	1748	1728
Adj Flow Rate, veh/h	130	543	20	87	636	50	22	250	80	65	458	206
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	2	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	148	868	32	341	626	49	68	439	134	136	833	362
Arrive On Green	0.09	0.55	0.55	0.55	0.55	0.55	0.85	0.85	0.85	0.43	0.43	0.43
Sat Flow, veh/h	1581	1588	59	787	1515	119	39	1028	314	187	1953	849
Grp Volume(v), veh/h	130	0	563	87	0	686	352	0	0	395	0	334
Grp Sat Flow(s),veh/h/ln	1581	0	1647	787	0	1634	1381	0	0	1614	0	1376
Q Serve(g_s), s	6.1	0.0	17.7	5.7	0.0	31.0	0.0	0.0	0.0	4.5	0.0	13.8
Cycle Q Clear(g_c), s	6.1	0.0	17.7	13.4	0.0	31.0	5.3	0.0	0.0	13.2	0.0	13.8
Prop In Lane	1.00		0.04	1.00		0.07	0.06		0.23	0.16		0.62
Lane Grp Cap(c), veh/h	148	0	900	341	0	676	640	0	0	744	0	587
V/C Ratio(X)	0.88	0.00	0.63	0.26	0.00	1.02	0.55	0.00	0.00	0.53	0.00	0.57
Avail Cap(c_a), veh/h	148	0	900	341	0	676	640	0	0	744	0	587
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.64	0.00	0.64	0.84	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.6	0.0	11.7	15.5	0.0	16.9	3.5	0.0	0.0	16.0	0.0	16.3
Incr Delay (d2), s/veh	47.7	0.0	3.3	1.1	0.0	31.5	2.8	0.0	0.0	2.7	0.0	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	8.8	1.3	0.0	19.5	2.3	0.0	0.0	6.6	0.0	5.8
LnGrp Delay(d),s/veh	81.3	0.0	15.0	16.7	0.0	48.4	6.4	0.0	0.0	18.7	0.0	20.2
LnGrp LOS	F		B	B		F	A			B		C
Approach Vol, veh/h		693			773			352			729	
Approach Delay, s/veh		27.4			44.8			6.4			19.4	
Approach LOS		C			D			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		45.2		36.8	10.0	35.2		36.8				
Change Period (Y+Rc), s		* 4.2		4.6	3.0	* 4.2		4.6				
Max Green Setting (Gmax), s		* 41		25.4	7.0	* 31		25.4				
Max Q Clear Time (g_c+I1), s		19.7		7.3	8.1	33.0		15.8				
Green Ext Time (p_c), s		5.5		3.1	0.0	0.0		4.4				
Intersection Summary												
HCM 2010 Ctrl Delay			27.5									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis

2: Hetherton & Mission

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑						↑↑	↑
Traffic Volume (vph)	0	515	90	40	230	0	0	0	0	245	1097	500
Future Volume (vph)	0	515	90	40	230	0	0	0	0	245	1097	500
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	10	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		0.95			1.00						0.95	1.00
Frbp, ped/bikes		0.99			1.00						1.00	0.97
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.98			1.00						1.00	0.85
Flt Protected		1.00			0.99						0.99	1.00
Satd. Flow (prot)		2711			1767						2961	1303
Flt Permitted		1.00			0.80						0.99	1.00
Satd. Flow (perm)		2711			1421						2961	1303
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	560	98	43	250	0	0	0	0	266	1192	543
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	639	0	0	293	0	0	0	0	0	1458	543
Confl. Peds. (#/hr)	15		22	22		15			16			1
Confl. Bikes (#/hr)			3			2			1			3
Turn Type		NA		Perm	NA					Split	NA	custom
Protected Phases		4			8					2	2	
Permitted Phases				8								5
Actuated Green, G (s)		23.8			23.8						42.4	35.4
Effective Green, g (s)		23.8			23.8						42.4	35.4
Actuated g/C Ratio		0.32			0.32						0.57	0.47
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		860			450						1673	615
v/s Ratio Prot		c0.24									c0.49	
v/s Ratio Perm					0.21							0.42
v/c Ratio		0.74			0.65						0.87	0.88
Uniform Delay, d1		22.9			22.0						14.0	17.9
Progression Factor		0.74			1.33						1.00	1.00
Incremental Delay, d2		4.8			5.6						6.6	16.7
Delay (s)		21.8			34.9						20.5	34.7
Level of Service		C			C						C	C
Approach Delay (s)		21.8			34.9			0.0			24.4	
Approach LOS		C			C			A			C	

Intersection Summary

HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

3: Irwin & Mission

Cumulative Plus Project Buildout




















Timing Plan: AM Peak Hour



Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2	
Lane Configurations											
Traffic Volume (vph)	400	30	330	170	340	10	110	1150	140	40	
Future Volume (vph)	400	30	330	170	340	10	110	1150	140	40	
Ideal Flow (vphpl)	2200	1800	2200	2200	2200	1800	2200	2200	1800	2200	
Lane Width	9	12	10	10	9	12	12	12	12	12	
Total Lost time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Lane Util. Factor		1.00	1.00	1.00	1.00			0.95	1.00		
Frbp, ped/bikes		1.00	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		
Frt		1.00	1.00	1.00	0.85			1.00	0.85		
Flt Protected		0.95	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (prot)		1494	1794	1615	1471			3430	1294		
Flt Permitted		0.58	1.00	1.00	1.00			1.00	1.00		
Satd. Flow (perm)		919	1794	1615	1471			3430	1294		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	435	33	359	185	370	11	120	1250	152	43	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	46	0	
Lane Group Flow (vph)	0	468	359	185	381	0	0	1370	149	0	
Confl. Peds. (#/hr)							13			6	
Confl. Bikes (#/hr)					2	2				2	
Parking (#/hr)				0				2			
Turn Type	pm+pt	pm+pt	NA	NA	Prot		Perm	NA	Perm		
Protected Phases	5	5	2	6	6			4			
Permitted Phases	2	2					4			4	
Actuated Green, G (s)		34.8	34.8	19.8	19.8			31.8	31.8		
Effective Green, g (s)		34.8	34.8	19.8	19.8			31.8	31.8		
Actuated g/C Ratio		0.46	0.46	0.26	0.26			0.42	0.42		
Clearance Time (s)		4.2	4.2	4.2	4.2			4.2	4.2		
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0		
Lane Grp Cap (vph)		509	832	426	388			1454	548		
v/s Ratio Prot		c0.13	0.20	0.11	0.26						
v/s Ratio Perm		c0.29						0.40	0.12		
v/c Ratio		0.92	0.43	0.43	0.98			0.94	0.27		
Uniform Delay, d1		19.1	13.5	22.9	27.4			20.7	14.1		
Progression Factor		0.91	0.80	1.00	1.00			0.75	0.71		
Incremental Delay, d2		14.6	0.2	0.7	40.7			6.1	0.5		
Delay (s)		32.0	11.0	23.7	68.1			21.7	10.5		
Level of Service		C	B	C	E			C	B		
Approach Delay (s)			22.9	53.6				20.3			
Approach LOS			C	D				C			
Intersection Summary											
HCM 2000 Control Delay			27.4							HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.98								
Actuated Cycle Length (s)			75.0							Sum of lost time (s)	12.6
Intersection Capacity Utilization			94.1%							ICU Level of Service	F
Analysis Period (min)			15								
c	Critical Lane Group										

HCM 2010 Signalized Intersection Summary
4: Lincoln & 5th

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	320	40	70	290	70	20	240	70	50	421	50
Future Volume (veh/h)	40	320	40	70	290	70	20	240	70	50	421	50
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	0.99		0.95	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1398	1545	1530	1398	1485	1530	1440	1485	1469	1440	1485	1469
Adj Flow Rate, veh/h	43	348	36	76	315	63	22	261	62	54	458	49
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	126	409	42	143	356	71	72	563	128	97	612	63
Arrive On Green	0.30	0.30	0.30	0.10	0.10	0.10	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	792	1370	142	785	1193	239	37	973	221	76	1057	108
Grp Volume(v), veh/h	43	0	384	76	0	378	345	0	0	561	0	0
Grp Sat Flow(s),veh/h/ln	792	0	1512	785	0	1432	1231	0	0	1242	0	0
Q Serve(g_s), s	2.9	0.0	17.9	4.5	0.0	19.5	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	22.4	0.0	17.9	22.4	0.0	19.5	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.09	1.00		0.17	0.06		0.18	0.10		0.09
Lane Grp Cap(c), veh/h	126	0	452	143	0	428	763	0	0	771	0	0
V/C Ratio(X)	0.34	0.00	0.85	0.53	0.00	0.88	0.45	0.00	0.00	0.73	0.00	0.00
Avail Cap(c_a), veh/h	126	0	452	143	0	428	763	0	0	771	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.94	0.00	0.94	0.86	0.00	0.00	0.38	0.00	0.00
Uniform Delay (d), s/veh	36.5	0.0	24.7	43.6	0.0	32.5	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	7.2	0.0	17.9	12.7	0.0	21.4	1.7	0.0	0.0	2.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	9.7	2.1	0.0	10.3	0.4	0.0	0.0	0.5	0.0	0.0
LnGrp Delay(d),s/veh	43.7	0.0	42.6	56.3	0.0	54.0	1.7	0.0	0.0	2.3	0.0	0.0
LnGrp LOS	D		D	E		D	A			A		
Approach Vol, veh/h		427			454			345			561	
Approach Delay, s/veh		42.7			54.3			1.7			2.3	
Approach LOS		D			D			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		27.0		48.0		27.0		48.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		22.4		43.4		22.4		43.4				
Max Q Clear Time (g_c+I1), s		24.4		2.0		24.4		2.0				
Green Ext Time (p_c), s		0.0		1.7		0.0		3.0				
Intersection Summary												
HCM 2010 Ctrl Delay				25.1								
HCM 2010 LOS				C								

HCM Signalized Intersection Capacity Analysis

5: Hetherton & 5th


















Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↕↕↕	↕
Traffic Volume (vph)	0	260	180	40	245	0	0	0	0	50	1052	125
Future Volume (vph)	0	260	180	40	245	0	0	0	0	50	1052	125
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		1.00			1.00						0.91	1.00
Frbp, ped/bikes		0.99			1.00						1.00	0.95
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.94			1.00						1.00	0.85
Flt Protected		1.00			0.99						1.00	1.00
Satd. Flow (prot)		1665			1769						4119	1127
Flt Permitted		1.00			0.90						1.00	1.00
Satd. Flow (perm)		1665			1604						4119	1127
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	283	196	43	266	0	0	0	0	54	1143	136
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	468	0	0	309	0	0	0	0	0	1197	136
Confl. Peds. (#/hr)			15	15		14			22	22		10
Confl. Bikes (#/hr)			4			2			2			2
Parking (#/hr)											2	2
Turn Type		NA		Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases				8						2		5
Actuated Green, G (s)		35.8			35.8						30.4	23.4
Effective Green, g (s)		35.8			35.8						30.4	23.4
Actuated g/C Ratio		0.48			0.48						0.41	0.31
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		794			765						1669	351
v/s Ratio Prot		c0.28										
v/s Ratio Perm					0.19						0.29	0.12
v/c Ratio		0.59			0.40						0.72	0.39
Uniform Delay, d1		14.2			12.7						18.7	20.2
Progression Factor		0.45			1.32						0.61	0.69
Incremental Delay, d2		3.0			0.9						1.3	1.6
Delay (s)		9.5			17.6						12.7	15.5
Level of Service		A			B						B	B
Approach Delay (s)		9.5			17.6			0.0			13.0	
Approach LOS		A			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			12.9								HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			75.0								Sum of lost time (s)	10.8
Intersection Capacity Utilization			86.8%								ICU Level of Service	E
Analysis Period (min)			15									
c Critical Lane Group												




















HCM 2010 Signalized Intersection Summary
6: Irwin & 5th

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	110	0	0	160	130	150	1190	20	0	0	0
Future Volume (veh/h)	150	110	0	0	160	130	150	1190	20	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.89	0.89	1.00	0.89			
Adj Sat Flow, veh/h/ln	1573	1573	0	0	1573	1620	1620	1573	1620			
Adj Flow Rate, veh/h	163	120	0	0	174	103	163	1293	21			
Adj No. of Lanes	1	1	0	0	1	0	0	2	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	0	3	0			
Cap, veh/h	218	491	0	0	254	151	165	1381	23			
Arrive On Green	0.10	0.10	0.00	0.00	0.31	0.31	0.19	0.19	0.19			
Sat Flow, veh/h	976	1573	0	0	816	483	292	2443	41			
Grp Volume(v), veh/h	163	120	0	0	0	277	772	0	705			
Grp Sat Flow(s),veh/h/ln	976	1573	0	0	0	1299	1385	0	1392			
Q Serve(g_s), s	9.4	5.3	0.0	0.0	0.0	14.0	41.7	0.0	37.1			
Cycle Q Clear(g_c), s	23.4	5.3	0.0	0.0	0.0	14.0	41.7	0.0	37.1			
Prop In Lane	1.00		0.00	0.00		0.37	0.21		0.03			
Lane Grp Cap(c), veh/h	218	491	0	0	0	405	783	0	787			
V/C Ratio(X)	0.75	0.24	0.00	0.00	0.00	0.68	0.99	0.00	0.90			
Avail Cap(c_a), veh/h	218	491	0	0	0	405	783	0	787			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)	0.77	0.77	0.00	0.00	0.00	1.00	0.09	0.00	0.09			
Uniform Delay (d), s/veh	41.8	25.5	0.0	0.0	0.0	22.6	30.2	0.0	28.3			
Incr Delay (d2), s/veh	10.4	0.2	0.0	0.0	0.0	4.7	6.9	0.0	1.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.0	2.3	0.0	0.0	0.0	5.5	17.5	0.0	14.7			
LnGrp Delay(d),s/veh	52.2	25.7	0.0	0.0	0.0	27.3	37.1	0.0	30.1			
LnGrp LOS	D	C				C	D		C			
Approach Vol, veh/h		283			277			1477				
Approach Delay, s/veh		41.0			27.3			33.7				
Approach LOS		D			C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		28.0		47.0		28.0						
Change Period (Y+Rc), s		4.6		4.6		4.6						
Max Green Setting (Gmax), s		23.4		42.4		23.4						
Max Q Clear Time (g_c+I1), s		25.4		43.7		16.0						
Green Ext Time (p_c), s		0.0		0.0		0.7						
Intersection Summary												
HCM 2010 Ctrl Delay				33.9								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary
7: Lincoln & 4th

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour

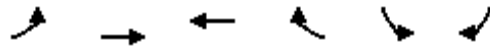
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	265	20	80	340	60	20	240	70	85	371	80
Future Volume (veh/h)	40	265	20	80	340	60	20	240	70	85	371	80
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.90	0.97		0.91	0.97		0.92	0.99		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1573	1510	1620	1573	1573	1620	1620	1573	1555	1620	1573	1555
Adj Flow Rate, veh/h	43	288	19	87	370	56	22	261	62	92	403	78
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	117	423	28	209	400	60	74	598	136	144	541	99
Arrive On Green	0.30	0.30	0.30	0.10	0.10	0.10	0.19	0.19	0.19	1.00	1.00	1.00
Sat Flow, veh/h	853	1390	92	925	1314	199	39	1024	233	151	927	170
Grp Volume(v), veh/h	43	0	307	87	0	426	345	0	0	573	0	0
Grp Sat Flow(s),veh/h/ln	853	0	1482	925	0	1513	1296	0	0	1248	0	0
Q Serve(g_s), s	1.9	0.0	13.6	7.0	0.0	20.9	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	22.8	0.0	13.6	20.6	0.0	20.9	17.1	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.13	0.06		0.18	0.16		0.14
Lane Grp Cap(c), veh/h	117	0	450	209	0	460	808	0	0	784	0	0
V/C Ratio(X)	0.37	0.00	0.68	0.42	0.00	0.93	0.43	0.00	0.00	0.73	0.00	0.00
Avail Cap(c_a), veh/h	117	0	450	209	0	460	808	0	0	784	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.92	0.00	0.92	0.75	0.00	0.00	0.48	0.00	0.00
Uniform Delay (d), s/veh	37.0	0.0	22.9	39.5	0.0	32.9	19.5	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	8.7	0.0	8.1	5.5	0.0	25.5	1.2	0.0	0.0	2.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	6.6	2.1	0.0	12.1	6.6	0.0	0.0	0.6	0.0	0.0
LnGrp Delay(d),s/veh	45.7	0.0	31.0	45.1	0.0	58.4	20.8	0.0	0.0	2.9	0.0	0.0
LnGrp LOS	D		C	D		E	C			A		
Approach Vol, veh/h		350			513			345			573	
Approach Delay, s/veh		32.8			56.1			20.8			2.9	
Approach LOS		C			E			C			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		27.0		48.0		27.0		48.0				
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2		* 4.2				
Max Green Setting (Gmax), s		* 23		* 44		* 23		* 44				
Max Q Clear Time (g_c+I1), s		24.8		19.1		22.9		2.0				
Green Ext Time (p_c), s		0.0		3.3		0.0		7.4				
Intersection Summary												
HCM 2010 Ctrl Delay				27.6								
HCM 2010 LOS				C								
Notes												

HCM Signalized Intersection Capacity Analysis

8: 4th & Tamalpais

Cumulative Plus Project Buildout

Timing Plan: AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↗
Traffic Volume (vph)	0	500	430	0	0	55
Future Volume (vph)	0	500	430	0	0	55
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.6	5.6			5.2
Lane Util. Factor		1.00	1.00			1.00
Frbp, ped/bikes		1.00	1.00			0.87
Flpb, ped/bikes		1.00	1.00			1.00
Frt		1.00	1.00			0.86
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		1573	1573			1188
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		1573	1573			1188
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	543	467	0	0	60
RTOR Reduction (vph)	0	0	0	0	0	49
Lane Group Flow (vph)	0	543	467	0	0	11
Confl. Peds. (#/hr)				39		46
Confl. Bikes (#/hr)				4		
Turn Type		NA	NA			Perm
Protected Phases		2 8	4 6			
Permitted Phases						8
Actuated Green, G (s)		50.3	50.4			13.8
Effective Green, g (s)		50.3	50.4			13.8
Actuated g/C Ratio		0.67	0.67			0.18
Clearance Time (s)						5.2
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)		1054	1057			218
v/s Ratio Prot		c0.35	c0.30			
v/s Ratio Perm						0.01
v/c Ratio		0.52	0.44			0.05
Uniform Delay, d1		6.2	5.7			25.2
Progression Factor		1.32	0.48			1.00
Incremental Delay, d2		0.3	0.2			0.1
Delay (s)		8.6	2.9			25.3
Level of Service		A	A			C
Approach Delay (s)		8.6	2.9		25.3	
Approach LOS		A	A		C	
Intersection Summary						
HCM 2000 Control Delay			7.0		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.57			
Actuated Cycle Length (s)			75.0		Sum of lost time (s)	16.4
Intersection Capacity Utilization			97.1%		ICU Level of Service	F
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

9: Hetherton & 4th

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour





















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↘	↑						↑↑↑	↗
Traffic Volume (vph)	0	305	200	200	305	0	0	0	0	110	972	190
Future Volume (vph)	0	305	200	200	305	0	0	0	0	110	972	190
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	13	10	15	11	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Lane Util. Factor		1.00	1.00	1.00	1.00						0.91	1.00
Frbp, ped/bikes		1.00	0.95	1.00	1.00						1.00	0.89
Flpb, ped/bikes		1.00	1.00	0.98	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						0.99	1.00
Satd. Flow (prot)		1625	1181	1607	1520						4265	1184
Flt Permitted		1.00	1.00	0.49	1.00						0.99	1.00
Satd. Flow (perm)		1625	1181	824	1520						4265	1184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	332	217	217	332	0	0	0	0	120	1057	207
RTOR Reduction (vph)	0	0	27	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	332	190	217	332	0	0	0	0	0	1177	207
Confl. Peds. (#/hr)			40	40		22			9	9		30
Confl. Bikes (#/hr)			8			4						2
Turn Type		NA	Perm	Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases			4	8						2		5
Actuated Green, G (s)		35.8	35.8	35.8	35.8						30.4	23.4
Effective Green, g (s)		35.8	35.8	35.8	35.8						30.4	23.4
Actuated g/C Ratio		0.48	0.48	0.48	0.48						0.41	0.31
Clearance Time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		775	563	393	725						1728	369
v/s Ratio Prot		0.20			0.22							
v/s Ratio Perm			0.16	0.26							0.28	0.17
v/c Ratio		0.43	0.34	0.55	0.46						0.68	0.56
Uniform Delay, d1		12.9	12.2	13.9	13.1						18.3	21.5
Progression Factor		0.49	0.42	1.03	1.07						0.32	0.42
Incremental Delay, d2		1.5	1.4	3.8	1.4						1.6	4.4
Delay (s)		7.9	6.6	18.2	15.4						7.4	13.3
Level of Service		A	A	B	B						A	B
Approach Delay (s)		7.4			16.5			0.0			8.3	
Approach LOS		A			B			A			A	

Intersection Summary

HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



















HCM 2010 Signalized Intersection Summary
10: Irwin & 4th

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	240	0	0	380	70	130	1150	50	0	0	0
Future Volume (veh/h)	170	240	0	0	380	70	130	1150	50	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.96	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	0.89			
Adj Sat Flow, veh/h/ln	1573	1573	0	0	1573	1620	1510	1573	1620			
Adj Flow Rate, veh/h	185	261	0	0	413	66	141	1250	50			
Adj No. of Lanes	1	1	0	0	1	0	1	2	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	137	625	0	0	465	74	706	1356	54			
Arrive On Green	0.79	0.79	0.00	0.00	0.13	0.13	0.16	0.16	0.16			
Sat Flow, veh/h	813	1573	0	0	1170	187	1438	2763	110			
Grp Volume(v), veh/h	185	261	0	0	0	479	141	675	625			
Grp Sat Flow(s),veh/h/ln	813	1573	0	0	0	1357	1438	1494	1380			
Q Serve(g_s), s	3.8	3.8	0.0	0.0	0.0	26.0	6.4	33.4	33.5			
Cycle Q Clear(g_c), s	29.8	3.8	0.0	0.0	0.0	26.0	6.4	33.4	33.5			
Prop In Lane	1.00		0.00	0.00		0.14	1.00		0.08			
Lane Grp Cap(c), veh/h	137	625	0	0	0	539	706	733	677			
V/C Ratio(X)	1.35	0.42	0.00	0.00	0.00	0.89	0.20	0.92	0.92			
Avail Cap(c_a), veh/h	137	625	0	0	0	539	706	733	677			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33			
Upstream Filter(I)	0.91	0.91	0.00	0.00	0.00	1.00	0.16	0.16	0.16			
Uniform Delay (d), s/veh	22.0	5.0	0.0	0.0	0.0	31.0	18.7	30.0	30.0			
Incr Delay (d2), s/veh	196.0	1.9	0.0	0.0	0.0	19.3	0.1	4.1	4.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	10.2	1.8	0.0	0.0	0.0	12.7	2.6	14.7	13.6			
LnGrp Delay(d),s/veh	218.1	6.9	0.0	0.0	0.0	50.2	18.8	34.1	34.6			
LnGrp LOS	F	A				D	B	C	C			
Approach Vol, veh/h		446			479			1441				
Approach Delay, s/veh		94.5			50.2			32.8				
Approach LOS		F			D			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		34.0		41.0		34.0						
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2						
Max Green Setting (Gmax), s		* 30		* 37		* 30						
Max Q Clear Time (g_c+I1), s		31.8		35.5		28.0						
Green Ext Time (p_c), s		0.0		0.9		0.4						
Intersection Summary												
HCM 2010 Ctrl Delay			48.0									
HCM 2010 LOS			D									
Notes												













HCM 2010 Signalized Intersection Summary
 11: D & 3rd

Cumulative Plus Project Buildout
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  						  	
Traffic Volume (veh/h)	0	0	0	320	1222	0	0	0	0	0	240	30
Future Volume (veh/h)	0	0	0	320	1222	0	0	0	0	0	240	30
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.98
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1530	1485	0				0	1485	1530
Adj Flow Rate, veh/h				348	1328	0				0	261	17
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				586	2029	0				0	525	34
Arrive On Green				0.22	0.22	0.00				0.00	0.21	0.21
Sat Flow, veh/h				754	3124	0				0	2611	164
Grp Volume(v), veh/h				598	1078	0				0	144	134
Grp Sat Flow(s),veh/h/ln				1297	1230	0				0	1411	1290
Q Serve(g_s), s				31.7	29.8	0.0				0.0	6.8	6.9
Cycle Q Clear(g_c), s				31.7	29.8	0.0				0.0	6.8	6.9
Prop In Lane				0.58		0.00				0.00		0.13
Lane Grp Cap(c), veh/h				952	1662	0				0	292	267
V/C Ratio(X)				0.63	0.65	0.00				0.00	0.49	0.50
Avail Cap(c_a), veh/h				952	1662	0				0	440	402
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				0.68	0.68	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				21.8	21.0	0.0				0.0	26.3	26.3
Incr Delay (d2), s/veh				2.2	1.3	0.0				0.0	1.3	1.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				12.0	10.5	0.0				0.0	2.8	2.6
LnGrp Delay(d),s/veh				23.9	22.4	0.0				0.0	27.6	27.8
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1676						278	
Approach Delay, s/veh					22.9						27.6	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		54.9		20.1								
Change Period (Y+Rc), s		* 4.2		4.6								
Max Green Setting (Gmax), s		* 43		23.4								
Max Q Clear Time (g_c+I1), s		33.7		8.9								
Green Ext Time (p_c), s		5.6		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay				23.6								
HCM 2010 LOS				C								
Notes												













HCM 2010 Signalized Intersection Summary
12: C & 3rd

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↗		↖				
Traffic Volume (veh/h)	0	0	0	0	1417	120	110	250	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1417	120	110	250	0	0	0	0
Number				5	2	12	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.98	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1398	1398	1440	1398	0			
Adj Flow Rate, veh/h				0	1540	97	120	272	0			
Adj No. of Lanes				0	3	1	0	2	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	3	3	3	3	0			
Cap, veh/h				0	2536	774	218	404	0			
Arrive On Green				0.00	0.22	0.22	0.07	0.07	0.00			
Sat Flow, veh/h				0	3943	1164	640	1870	0			
Grp Volume(v), veh/h				0	1540	97	216	176	0			
Grp Sat Flow(s),veh/h/ln				0	1272	1164	1238	1209	0			
Q Serve(g_s), s				0.0	27.3	5.0	11.7	10.7	0.0			
Cycle Q Clear(g_c), s				0.0	27.3	5.0	12.8	10.7	0.0			
Prop In Lane				0.00		1.00	0.56		0.00			
Lane Grp Cap(c), veh/h				0	2536	774	351	270	0			
V/C Ratio(X)				0.00	0.61	0.13	0.61	0.65	0.00			
Avail Cap(c_a), veh/h				0	2536	774	421	338	0			
HCM Platoon Ratio				1.00	0.33	0.33	0.33	0.33	1.00			
Upstream Filter(I)				0.00	0.56	0.56	0.79	0.79	0.00			
Uniform Delay (d), s/veh				0.0	20.5	11.8	32.8	31.9	0.0			
Incr Delay (d2), s/veh				0.0	0.6	0.2	1.5	2.5	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	9.8	1.7	4.6	3.7	0.0			
LnGrp Delay(d),s/veh				0.0	21.1	12.0	34.3	34.4	0.0			
LnGrp LOS					C	B	C	C				
Approach Vol, veh/h					1637			392				
Approach Delay, s/veh					20.5			34.3				
Approach LOS					C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		54.0		21.0								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 46		* 21								
Max Q Clear Time (g_c+I1), s		29.3		14.8								
Green Ext Time (p_c), s		8.4		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay				23.2								
HCM 2010 LOS				C								
Notes												

















HCM 2010 Signalized Intersection Summary
13: B & 3rd

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑						↑↑	
Traffic Volume (veh/h)	0	0	0	90	1472	0	0	0	0	0	200	60
Future Volume (veh/h)	0	0	0	90	1472	0	0	0	0	0	200	60
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.86
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1440	1398	0				0	1398	1440
Adj Flow Rate, veh/h				98	1600	0				0	217	45
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				165	2266	0				0	486	97
Arrive On Green				0.21	0.21	0.00				0.00	0.24	0.24
Sat Flow, veh/h				170	3616	0				0	2091	401
Grp Volume(v), veh/h				631	1067	0				0	139	123
Grp Sat Flow(s),veh/h/ln				1356	1158	0				0	1328	1094
Q Serve(g_s), s				23.2	32.0	0.0				0.0	6.7	7.2
Cycle Q Clear(g_c), s				32.3	32.0	0.0				0.0	6.7	7.2
Prop In Lane				0.16		0.00				0.00		0.37
Lane Grp Cap(c), veh/h				933	1499	0				0	320	263
V/C Ratio(X)				0.68	0.71	0.00				0.00	0.44	0.47
Avail Cap(c_a), veh/h				933	1499	0				0	411	338
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				0.69	0.69	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				23.0	23.0	0.0				0.0	24.2	24.3
Incr Delay (d2), s/veh				2.7	2.0	0.0				0.0	0.9	1.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				12.9	10.7	0.0				0.0	2.5	2.3
LnGrp Delay(d),s/veh				25.7	25.0	0.0				0.0	25.1	25.6
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					1698						262	
Approach Delay, s/veh					25.3						25.3	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		52.7		22.3								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 43		* 23								
Max Q Clear Time (g_c+I1), s		34.3		9.2								
Green Ext Time (p_c), s		5.6		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay				25.3								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary
14: A & 3rd

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	40	1312	80	210	135	0	0	140	30
Future Volume (veh/h)	0	0	0	40	1312	80	210	135	0	0	140	30
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	0.96		1.00	1.00		0.92
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1800	1748	1800	1835	1835	0	0	1835	1890
Adj Flow Rate, veh/h				43	1426	78	228	147	0	0	152	21
Adj No. of Lanes				0	3	0	1	1	0	0	1	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	3	0	3	3	0	0	3	3
Cap, veh/h				73	2568	145	303	606	0	0	302	42
Arrive On Green				0.56	0.56	0.56	0.02	0.11	0.00	0.00	0.22	0.22
Sat Flow, veh/h				131	4618	261	1748	1835	0	0	1389	192
Grp Volume(v), veh/h				571	475	501	228	147	0	0	0	173
Grp Sat Flow(s),veh/h/ln				1741	1590	1679	1748	1835	0	0	0	1581
Q Serve(g_s), s				16.2	14.2	14.2	0.6	5.5	0.0	0.0	0.0	7.2
Cycle Q Clear(g_c), s				16.2	14.2	14.2	0.6	5.5	0.0	0.0	0.0	7.2
Prop In Lane				0.08		0.16	1.00		0.00	0.00		0.12
Lane Grp Cap(c), veh/h				968	885	934	303	606	0	0	0	344
V/C Ratio(X)				0.59	0.54	0.54	0.75	0.24	0.00	0.00	0.00	0.50
Avail Cap(c_a), veh/h				968	885	934	443	807	0	0	0	390
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	0.84	0.84	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				11.0	10.5	10.5	33.1	24.8	0.0	0.0	0.0	25.8
Incr Delay (d2), s/veh				2.6	2.3	2.2	6.8	0.4	0.0	0.0	0.0	2.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				8.5	6.8	7.1	5.2	2.9	0.0	0.0	0.0	3.4
LnGrp Delay(d),s/veh				13.6	12.9	12.7	40.0	25.2	0.0	0.0	0.0	28.2
LnGrp LOS				B	B	B	D	C				C
Approach Vol, veh/h					1547			375			173	
Approach Delay, s/veh					13.1			34.2			28.2	
Approach LOS					B			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			8.0	20.8		46.2		28.8				
Change Period (Y+Rc), s			4.0	4.5		4.5		4.0				
Max Green Setting (Gmax), s			10.0	18.5		33.5		33.0				
Max Q Clear Time (g_c+I1), s			2.6	9.2		18.2		7.5				
Green Ext Time (p_c), s			1.0	0.8		11.2		1.1				
Intersection Summary												
HCM 2010 Ctrl Delay				18.1								
HCM 2010 LOS				B								

Intersection 15 Brooks St/3rd St Side-street Stop
















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	21	16	75.4%	7.5	4.0	A
	Through	5	3	51.5%	16.5	17.3	C
	Right Turn						
	Subtotal	26	18	70.8%	10.6	4.7	B
SB	Left Turn						
	Through	5	6	110.4%	13.6	13.1	B
	Right Turn	10	9	88.3%	19.8	13.6	C
	Subtotal	15	14	95.7%	18.8	11.8	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	51	39	76.5%	2.4	0.2	A
	Through	1,401	1,338	95.5%	1.9	0.4	A
	Right Turn	10	10	95.7%	1.7	1.1	A
	Subtotal	1,462	1,387	94.9%	2.0	0.4	A
Total		1,503	1,420	94.5%	2.3	0.3	A

Intersection 16 Lindaro St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	86	85	99.3%	24.0	6.5	C
	Through	10	8	81.0%	19.4	18.3	B
	Right Turn						
	Subtotal	96	93	97.4%	23.9	6.3	C
SB	Left Turn						
	Through	40	39	98.4%	51.0	25.2	D
	Right Turn	10	10	95.7%	37.4	38.5	D
	Subtotal	50	49	97.9%	48.6	27.8	D
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	477	431	90.4%	29.6	10.7	C
	Through	1,396	1,319	94.5%	9.0	3.0	A
	Right Turn	30	31	101.8%	8.3	2.6	A
	Subtotal	1,903	1,781	93.6%	13.9	4.8	B
Total		2,049	1,924	93.9%	15.3	4.7	B


















HCM 2010 Signalized Intersection Summary
17: Lincoln & 3rd

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	175	1775	75	42	195	0	0	290	166
Future Volume (veh/h)	0	0	0	175	1775	75	42	195	0	0	290	166
Number				1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.91	1.00		1.00	1.00		0.92
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Adj Sat Flow, veh/h/ln				1620	1573	1620	1620	1573	0	0	1510	1555
Adj Flow Rate, veh/h				190	1929	77	46	212	0	0	315	179
Adj No. of Lanes				0	3	0	0	1	0	0	1	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	3	0	3	3	0	0	3	3
Cap, veh/h				174	1884	77	57	184	0	0	315	179
Arrive On Green				0.16	0.16	0.16	0.13	0.13	0.00	0.00	0.13	0.13
Sat Flow, veh/h				367	3980	163	0	452	0	0	774	440
Grp Volume(v), veh/h				804	671	721	258	0	0	0	0	494
Grp Sat Flow(s),veh/h/ln				1554	1431	1525	452	0	0	0	0	1214
Q Serve(g_s), s				35.5	35.1	35.4	0.0	0.0	0.0	0.0	0.0	30.5
Cycle Q Clear(g_c), s				35.5	35.1	35.4	30.5	0.0	0.0	0.0	0.0	30.5
Prop In Lane				0.24		0.11	0.18		0.00	0.00		0.36
Lane Grp Cap(c), veh/h				736	677	722	240	0	0	0	0	494
V/C Ratio(X)				1.09	0.99	1.00	1.07	0.00	0.00	0.00	0.00	1.00
Avail Cap(c_a), veh/h				736	677	722	240	0	0	0	0	494
HCM Platoon Ratio				0.33	0.33	0.33	0.33	0.33	1.00	1.00	0.33	0.33
Upstream Filter(I)				0.24	0.24	0.24	1.00	0.00	0.00	0.00	0.00	0.44
Uniform Delay (d), s/veh				31.6	31.5	31.6	27.7	0.0	0.0	0.0	0.0	32.5
Incr Delay (d2), s/veh				47.7	14.9	16.2	79.2	0.0	0.0	0.0	0.0	26.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				25.0	16.7	18.2	10.3	0.0	0.0	0.0	0.0	13.9
LnGrp Delay(d),s/veh				79.3	46.4	47.8	106.9	0.0	0.0	0.0	0.0	59.3
LnGrp LOS				F	D	D	F					F
Approach Vol, veh/h					2196			258			494	
Approach Delay, s/veh					58.9			106.9			59.3	
Approach LOS					E			F			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				35.0		40.0		35.0				
Change Period (Y+Rc), s				4.5		4.5		4.5				
Max Green Setting (Gmax), s				30.5		35.5		30.5				
Max Q Clear Time (g_c+I1), s				32.5		37.5		32.5				
Green Ext Time (p_c), s				0.0		0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				63.2								
HCM 2010 LOS				E								

HCM Signalized Intersection Capacity Analysis
18: Tamalpais & 3rd


















Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  							
Traffic Volume (vph)	0	0	0	295	1960	30	50	50	0	0	0	0
Future Volume (vph)	0	0	0	295	1960	30	50	50	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1600	1600	1600	1600	1600	1800	1800	1600	1600
Lane Width	12	12	12	12	12	12	11	12	12	12	12	12
Total Lost time (s)					11.6		7.6	7.6				
Lane Util. Factor					0.91		1.00	1.00				
Frbp, ped/bikes					1.00		1.00	1.00				
Flpb, ped/bikes					0.98		0.93	1.00				
Frt					1.00		1.00	1.00				
Flt Protected					0.99		0.95	1.00				
Satd. Flow (prot)					3699		1057	1237				
Flt Permitted					0.99		0.95	1.00				
Satd. Flow (perm)					3699		1057	1237				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	321	2130	33	54	54	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	2482	0	54	54	0	0	0	0
Confl. Peds. (#/hr)			73	73		38	49		63			49
Confl. Bikes (#/hr)						2			2			2
Parking (#/hr)							3	3			3	3
Turn Type				Perm	NA		Perm	NA				
Protected Phases					6			4				
Permitted Phases				6			4					
Actuated Green, G (s)					51.8		19.0	19.0				
Effective Green, g (s)					51.8		19.0	19.0				
Actuated g/C Ratio					0.58		0.21	0.21				
Clearance Time (s)					11.6		7.6	7.6				
Vehicle Extension (s)					5.0		5.0	5.0				
Lane Grp Cap (vph)					2128		223	261				
v/s Ratio Prot								0.04				
v/s Ratio Perm					0.67		c0.05					
v/c Ratio					1.17		0.24	0.21				
Uniform Delay, d1					19.1		29.5	29.3				
Progression Factor					1.00		1.00	1.00				
Incremental Delay, d2					80.4		1.2	0.8				
Delay (s)					99.5		30.7	30.1				
Level of Service					F		C	C				
Approach Delay (s)		0.0			99.5			30.4			0.0	
Approach LOS		A			F			C			A	
Intersection Summary												
HCM 2000 Control Delay			96.7		HCM 2000 Level of Service				F			
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)				19.2			
Intersection Capacity Utilization			150.5%		ICU Level of Service				H			
Analysis Period (min)			15									

c Critical Lane Group













HCM 2010 Signalized Intersection Summary
19: Hetherton & 3rd

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	455	1688	0	0	0	0	0	825	547
Future Volume (veh/h)	0	0	0	455	1688	0	0	0	0	0	825	547
Number				1	6	16				3	8	18
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.84
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1545	1573	0				0	1573	1485
Adj Flow Rate, veh/h				495	1835	0				0	897	586
Adj No. of Lanes				1	3	0				0	3	1
Peak Hour Factor				0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %				3	3	0				0	3	3
Cap, veh/h				721	2006	0				0	1954	481
Arrive On Green				0.14	0.14	0.00				0.00	0.15	0.15
Sat Flow, veh/h				1471	4718	0				0	4435	1057
Grp Volume(v), veh/h				495	1835	0				0	897	586
Grp Sat Flow(s),veh/h/ln				1471	1573	0				0	1431	1057
Q Serve(g_s), s				24.4	28.8	0.0				0.0	14.3	34.1
Cycle Q Clear(g_c), s				24.4	28.8	0.0				0.0	14.3	34.1
Prop In Lane				1.00		0.00				0.00		1.00
Lane Grp Cap(c), veh/h				721	2006	0				0	1954	481
V/C Ratio(X)				0.69	0.91	0.00				0.00	0.46	1.22
Avail Cap(c_a), veh/h				724	2013	0				0	1954	481
HCM Platoon Ratio				0.33	0.33	1.00				1.00	0.33	0.33
Upstream Filter(I)				0.17	0.17	0.00				0.00	0.75	0.75
Uniform Delay (d), s/veh				29.0	30.9	0.0				0.0	23.4	31.9
Incr Delay (d2), s/veh				0.5	1.4	0.0				0.0	0.6	112.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.1	12.8	0.0				0.0	5.8	24.9
LnGrp Delay(d),s/veh				29.5	32.3	0.0				0.0	24.0	143.9
LnGrp LOS				C	C						C	F
Approach Vol, veh/h					2330						1483	
Approach Delay, s/veh					31.7						71.4	
Approach LOS					C						E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs						6		8				
Phs Duration (G+Y+Rc), s						35.9		39.1				
Change Period (Y+Rc), s						4.0		5.0				
Max Green Setting (Gmax), s						32.0		34.0				
Max Q Clear Time (g_c+I1), s						30.8		36.1				
Green Ext Time (p_c), s						1.1		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay					47.1							
HCM 2010 LOS					D							
Notes												
User approved volume balancing among the lanes for turning movement.												



















HCM 2010 Signalized Intersection Summary
20: Irwin & 3rd/3rd St

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑	↑	↑↑↑				
Traffic Volume (veh/h)	0	0	0	0	1101	120	1052	1215	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1101	120	1052	1215	0	0	0	0
Number				1	6	16	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.94	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1485	1485	1398	1398	0			
Adj Flow Rate, veh/h				0	1197	104	1143	1321	0			
Adj No. of Lanes				0	3	1	2	2	0			
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %				0	3	3	3	3	0			
Cap, veh/h				0	1333	389	1468	1542	0			
Arrive On Green				0.00	0.33	0.33	0.18	0.18	0.00			
Sat Flow, veh/h				0	4189	1184	2663	2796	0			
Grp Volume(v), veh/h				0	1197	104	1143	1321	0			
Grp Sat Flow(s),veh/h/ln				0	1352	1184	1331	1398	0			
Q Serve(g_s), s				0.0	21.1	4.8	30.7	34.3	0.0			
Cycle Q Clear(g_c), s				0.0	21.1	4.8	30.7	34.3	0.0			
Prop In Lane				0.00		1.00	1.00		0.00			
Lane Grp Cap(c), veh/h				0	1333	389	1468	1542	0			
V/C Ratio(X)				0.00	0.90	0.27	0.78	0.86	0.00			
Avail Cap(c_a), veh/h				0	1379	403	1468	1542	0			
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	0.09	0.09	0.00			
Uniform Delay (d), s/veh				0.0	24.0	18.5	26.3	27.8	0.0			
Incr Delay (d2), s/veh				0.0	8.0	0.4	0.4	0.6	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	8.9	1.6	11.4	13.4	0.0			
LnGrp Delay(d),s/veh				0.0	32.0	18.9	26.7	28.4	0.0			
LnGrp LOS					C	B	C	C				
Approach Vol, veh/h					1301			2464				
Approach Delay, s/veh					31.0			27.6				
Approach LOS					C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				45.8		29.2						
Change Period (Y+Rc), s				4.5		4.5						
Max Green Setting (Gmax), s				40.5		25.5						
Max Q Clear Time (g_c+I1), s				36.3		23.1						
Green Ext Time (p_c), s				3.7		1.6						
Intersection Summary												
HCM 2010 Ctrl Delay				28.8								
HCM 2010 LOS				C								
Notes												


















HCM 2010 Signalized Intersection Summary
21: D & 2nd

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  										
Traffic Volume (veh/h)	0	2062	90	0	0	0	0	0	270	80	475	0
Future Volume (veh/h)	0	2062	90	0	0	0	0	0	270	80	475	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1660	1710				0	1573	1620	1748	1748	0
Adj Flow Rate, veh/h	0	2241	91				0	0	277	87	516	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	0	0	0				0	0	420	246	565	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.32	0.11	0.11	0.00
Sat Flow, veh/h		0					0	0	1300	1072	1748	0
Grp Volume(v), veh/h		0.0					0	0	277	87	516	0
Grp Sat Flow(s),veh/h/ln							0	0	1300	1072	1748	0
Q Serve(g_s), s							0.0	0.0	13.7	6.0	21.9	0.0
Cycle Q Clear(g_c), s							0.0	0.0	13.7	19.7	21.9	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	420	246	565	0
V/C Ratio(X)							0.00	0.00	0.66	0.35	0.91	0.00
Avail Cap(c_a), veh/h							0	0	440	263	592	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	0.86	0.86	0.00
Uniform Delay (d), s/veh							0.0	0.0	21.8	38.2	32.5	0.0
Incr Delay (d2), s/veh							0.0	0.0	2.6	0.3	15.7	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	5.2	1.8	13.1	0.0
LnGrp Delay(d),s/veh							0.0	0.0	24.4	38.5	48.2	0.0
LnGrp LOS									C	D	D	
Approach Vol, veh/h								277			603	
Approach Delay, s/veh								24.4			46.8	
Approach LOS								C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				28.8				28.8				
Change Period (Y+Rc), s				4.6				4.6				
Max Green Setting (Gmax), s				25.4				25.4				
Max Q Clear Time (g_c+I1), s				23.9				15.7				
Green Ext Time (p_c), s				0.3				0.6				
Intersection Summary												
HCM 2010 Ctrl Delay				39.8								
HCM 2010 LOS				D								













HCM 2010 Signalized Intersection Summary
22: C & 2nd

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						 				
Traffic Volume (veh/h)	110	2302	0	0	0	0	0	225	100	0	0	0
Future Volume (veh/h)	110	2302	0	0	0	0	0	225	100	0	0	0
Number	1	6	16				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1440	1485	0				0	1485	1440			
Adj Flow Rate, veh/h	120	2502	0				0	245	107			
Adj No. of Lanes	0	3	0				0	2	0			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0				0	3	3			
Cap, veh/h	166	2789	0				0	361	152			
Arrive On Green	0.23	0.23	0.00				0.00	0.18	0.18			
Sat Flow, veh/h	159	3990	0				0	1966	827			
Grp Volume(v), veh/h	928	1694	0				0	183	169			
Grp Sat Flow(s),veh/h/ln	1446	1352	0				0	1485	1308			
Q Serve(g_s), s	39.4	45.6	0.0				0.0	8.6	9.1			
Cycle Q Clear(g_c), s	46.9	45.6	0.0				0.0	8.6	9.1			
Prop In Lane	0.13		0.00				0.00		0.63			
Lane Grp Cap(c), veh/h	1065	1890	0				0	273	240			
V/C Ratio(X)	0.87	0.90	0.00				0.00	0.67	0.70			
Avail Cap(c_a), veh/h	1065	1890	0				0	412	363			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	0.15	0.15	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	26.6	26.2	0.0				0.0	28.5	28.7			
Incr Delay (d2), s/veh	1.7	1.2	0.0				0.0	6.0	7.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	19.3	17.4	0.0				0.0	4.0	3.8			
LnGrp Delay(d),s/veh	28.4	27.4	0.0				0.0	34.5	36.5			
LnGrp LOS	C	C						C	D			
Approach Vol, veh/h		2622						352				
Approach Delay, s/veh		27.8						35.5				
Approach LOS		C						D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				18.0		57.0						
Change Period (Y+Rc), s				* 4.2		4.6						
Max Green Setting (Gmax), s				* 21		45.4						
Max Q Clear Time (g_c+I1), s				11.1		48.9						
Green Ext Time (p_c), s				2.0		0.0						
Intersection Summary												
HCM 2010 Ctrl Delay			28.7									
HCM 2010 LOS			C									
Notes												

















HCM 2010 Signalized Intersection Summary
 23: B & 2nd

Cumulative Plus Project Buildout
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑		↑	↑	
Traffic Volume (veh/h)	0	2327	70	0	0	0	0	0	170	70	230	0
Future Volume (veh/h)	0	2327	70	0	0	0	0	0	170	70	230	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.93	0.97		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1485	1382				0	1573	1591	1545	1485	0
Adj Flow Rate, veh/h	0	2529	72				0	0	165	76	250	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	0	0	0				0	0	291	216	346	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.23	0.08	0.08	0.00
Sat Flow, veh/h		0					0	0	1247	1036	1485	0
Grp Volume(v), veh/h		0.0					0	0	165	76	250	0
Grp Sat Flow(s),veh/h/ln							0	0	1247	1036	1485	0
Q Serve(g_s), s							0.0	0.0	8.8	5.4	12.3	0.0
Cycle Q Clear(g_c), s							0.0	0.0	8.8	14.2	12.3	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	291	216	346	0
V/C Ratio(X)							0.00	0.00	0.57	0.35	0.72	0.00
Avail Cap(c_a), veh/h							0	0	357	272	426	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	0.90	0.90	0.00
Uniform Delay (d), s/veh							0.0	0.0	25.4	37.4	32.2	0.0
Incr Delay (d2), s/veh							0.0	0.0	0.7	0.3	2.8	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	3.1	1.6	5.3	0.0
LnGrp Delay(d),s/veh							0.0	0.0	26.1	37.7	35.1	0.0
LnGrp LOS									C	D	D	
Approach Vol, veh/h								165			326	
Approach Delay, s/veh								26.1			35.7	
Approach LOS								C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				22.0				22.0				
Change Period (Y+Rc), s				4.5				4.5				
Max Green Setting (Gmax), s				21.5				21.5				
Max Q Clear Time (g_c+I1), s				16.2				10.8				
Green Ext Time (p_c), s				0.4				0.3				
Intersection Summary												
HCM 2010 Ctrl Delay				32.5								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary
24: A & 2nd

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	2252	205	0	0	0	0	260	20	50	125	0
Future Volume (veh/h)	100	2252	205	0	0	0	0	260	20	50	125	0
Number	5	2	12				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97				1.00		0.95	0.98		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1748	1800				0	1660	1710	1660	1660	0
Adj Flow Rate, veh/h	109	2448	210				0	283	13	54	136	0
Adj No. of Lanes	0	3	0				0	2	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	124	2931	253				0	448	20	156	366	0
Arrive On Green	0.22	0.22	0.22				0.00	0.15	0.15	0.01	0.07	0.00
Sat Flow, veh/h	187	4424	382				0	3147	140	1581	1660	0
Grp Volume(v), veh/h	1013	840	914				0	145	151	54	136	0
Grp Sat Flow(s),veh/h/ln	1738	1590	1664				0	1577	1627	1581	1660	0
Q Serve(g_s), s	42.3	37.5	39.3				0.0	6.5	6.6	0.0	5.9	0.0
Cycle Q Clear(g_c), s	42.3	37.5	39.3				0.0	6.5	6.6	0.0	5.9	0.0
Prop In Lane	0.11		0.23				0.00		0.09	1.00		0.00
Lane Grp Cap(c), veh/h	1152	1054	1103				0	231	238	156	366	0
V/C Ratio(X)	0.88	0.80	0.83				0.00	0.63	0.64	0.35	0.37	0.00
Avail Cap(c_a), veh/h	1152	1054	1103				0	336	347	170	487	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	0.09	0.09	0.09				0.00	1.00	1.00	0.81	0.81	0.00
Uniform Delay (d), s/veh	26.4	24.5	25.2				0.0	30.1	30.1	35.9	29.8	0.0
Incr Delay (d2), s/veh	1.0	0.6	0.7				0.0	5.9	5.9	2.3	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.7	16.7	18.4				0.0	3.2	3.3	1.2	2.8	0.0
LnGrp Delay(d),s/veh	27.4	25.1	25.9				0.0	36.0	36.0	38.2	30.9	0.0
LnGrp LOS	C	C	C					D	D	D	C	
Approach Vol, veh/h		2767						296			190	
Approach Delay, s/veh		26.2						36.0			33.0	
Approach LOS		C						D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		54.3		20.7			5.6	15.2				
Change Period (Y+Rc), s		4.6		* 4.2			* 4.2	* 4.2				
Max Green Setting (Gmax), s		44.2		* 22			* 2	* 16				
Max Q Clear Time (g_c+I1), s		44.3		7.9			2.0	8.6				
Green Ext Time (p_c), s		0.0		0.8			0.0	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			27.5									
HCM 2010 LOS			C									
Notes												

Intersection 25

Brooks St/2nd St

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	50	44	88.3%	22.0	9.9	C
	Through						
	Right Turn						
	Subtotal	50	44	88.3%	22.0	9.9	C
EB	Left Turn	25	17	67.7%	2.6	0.8	A
	Through	2,307	2,281	98.9%	2.5	0.2	A
	Right Turn						
	Subtotal	2,332	2,298	98.5%	2.5	0.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,382	2,342	98.3%	2.9	0.4	A

Intersection 26


















Lindaro St/2nd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	54	57	104.9%	18.0	2.8	B
	Right Turn	281	276	98.1%	18.7	4.6	B
	Subtotal	335	332	99.2%	18.7	3.9	B
SB	Left Turn	72	62	86.4%	39.3	5.7	D
	Through	442	406	91.8%	37.4	2.8	D
	Right Turn						
	Subtotal	514	468	91.0%	37.7	2.7	D
EB	Left Turn	42	37	88.5%	16.0	3.5	B
	Through	2,289	2,233	97.5%	14.7	2.5	B
	Right Turn	61	74	121.9%	14.1	3.2	B
	Subtotal	2,392	2,344	98.0%	14.7	2.4	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,241	3,144	97.0%	18.6	2.2	B



















HCM 2010 Signalized Intersection Summary
27: Lincoln & 2nd

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	2461	41	0	0	0	0	112	50	140	270	0
Future Volume (veh/h)	140	2461	41	0	0	0	0	112	50	140	270	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1398	1398				0	1398	1398	1382	1342	0
Adj Flow Rate, veh/h	152	2675	28				0	122	41	152	293	0
Adj No. of Lanes	0	4	1				0	1	1	0	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	145	2752	656				0	430	354	245	459	0
Arrive On Green	0.19	0.19	0.19				0.00	0.31	0.31	0.10	0.10	0.00
Sat Flow, veh/h	251	4742	1130				0	1398	1149	537	1554	0
Grp Volume(v), veh/h	840	1987	28				0	122	41	229	216	0
Grp Sat Flow(s),veh/h/ln	1386	1202	1130				0	1398	1149	870	1160	0
Q Serve(g_s), s	43.5	40.8	1.5				0.0	5.0	1.9	15.1	13.3	0.0
Cycle Q Clear(g_c), s	43.5	40.8	1.5				0.0	5.0	1.9	20.1	13.3	0.0
Prop In Lane	0.18		1.00				0.00		1.00	0.66		0.00
Lane Grp Cap(c), veh/h	804	2093	656				0	430	354	347	357	0
V/C Ratio(X)	1.04	0.95	0.04				0.00	0.28	0.12	0.66	0.60	0.00
Avail Cap(c_a), veh/h	804	2093	656				0	500	411	399	415	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	0.09	0.09	0.09				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.3	29.2	13.3				0.0	19.7	18.6	33.8	29.3	0.0
Incr Delay (d2), s/veh	24.2	1.4	0.0				0.0	0.4	0.1	3.3	1.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	22.1	13.9	0.5				0.0	1.9	0.6	5.0	4.5	0.0
LnGrp Delay(d),s/veh	54.5	30.6	13.3				0.0	20.1	18.8	37.1	31.2	0.0
LnGrp LOS	F	C	B					C	B	D	C	
Approach Vol, veh/h		2855						163			445	
Approach Delay, s/veh		37.4						19.7			34.3	
Approach LOS		D						B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		47.7		27.3				27.3				
Change Period (Y+Rc), s		* 4.2		* 4.2				* 4.2				
Max Green Setting (Gmax), s		* 40		* 27				* 27				
Max Q Clear Time (g_c+I1), s		45.5		7.0				22.1				
Green Ext Time (p_c), s		0.0		0.6				0.9				
Intersection Summary												
HCM 2010 Ctrl Delay			36.2									
HCM 2010 LOS			D									
Notes												

















HCM 2010 Signalized Intersection Summary
 28: Francisco W./Tamalpais & 2nd

Cumulative Plus Project Buildout
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	2516	70	0	0	0	0	50	270	100	200	0
Future Volume (veh/h)	50	2516	70	0	0	0	0	50	270	100	200	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1398	1398				0	1398	1454	1398	1398	0
Adj Flow Rate, veh/h	54	2735	48				0	54	254	109	217	0
Adj No. of Lanes	0	4	1				0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	53	2867	633				0	339	292	275	339	0
Arrive On Green	0.19	0.19	0.19				0.00	0.24	0.24	0.08	0.08	0.00
Sat Flow, veh/h	90	4910	1084				0	1398	1204	845	1398	0
Grp Volume(v), veh/h	832	1957	48				0	54	254	109	217	0
Grp Sat Flow(s),veh/h/ln	1394	1202	1084				0	1398	1204	845	1398	0
Q Serve(g_s), s	43.8	40.0	2.7				0.0	2.3	15.2	9.4	11.3	0.0
Cycle Q Clear(g_c), s	43.8	40.0	2.7				0.0	2.3	15.2	11.7	11.3	0.0
Prop In Lane	0.06		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	814	2106	633				0	339	292	275	339	0
V/C Ratio(X)	1.02	0.93	0.08				0.00	0.16	0.87	0.40	0.64	0.00
Avail Cap(c_a), veh/h	814	2106	633				0	513	441	380	513	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	0.09	0.09	0.09				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.3	28.8	13.7				0.0	22.4	27.3	32.6	31.3	0.0
Incr Delay (d2), s/veh	15.7	1.0	0.0				0.0	0.2	11.5	0.9	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.5	13.6	0.8				0.0	0.9	5.9	2.3	4.6	0.0
LnGrp Delay(d),s/veh	46.0	29.7	13.7				0.0	22.6	38.7	33.5	33.3	0.0
LnGrp LOS	F	C	B					C	D	C	C	
Approach Vol, veh/h		2837						308			326	
Approach Delay, s/veh		34.2						35.9			33.4	
Approach LOS		C						D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		50.3		24.7				24.7				
Change Period (Y+Rc), s		6.5		6.5				6.5				
Max Green Setting (Gmax), s		34.5		27.5				27.5				
Max Q Clear Time (g_c+I1), s		45.8		17.2				13.7				
Green Ext Time (p_c), s		0.0		1.0				1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			34.3									
HCM 2010 LOS			C									





















HCM 2010 Signalized Intersection Summary
 29: 101 SBO n 2nd/Hetherton & 2nd/2nd St

Cumulative Plus Project Buildout
 Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1270	1456	0	0	0	0	0	0	220	1060	0
Future Volume (veh/h)	0	1270	1456	0	0	0	0	0	0	220	1060	0
Number	5	2	12							7	4	14
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1485	1485							1485	1485	0
Adj Flow Rate, veh/h	0	1380	1570							239	1152	0
Adj No. of Lanes	0	3	2							1	2	0
Peak Hour Factor	0.92	0.92	0.92							0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3							3	3	0
Cap, veh/h	0	2406	1364							406	852	0
Arrive On Green	0.00	0.18	0.18							0.09	0.09	0.00
Sat Flow, veh/h	0	4456	2525							1415	2971	0
Grp Volume(v), veh/h	0	1380	1570							239	1152	0
Grp Sat Flow(s),veh/h/ln	0	1485	1263							1415	1485	0
Q Serve(g_s), s	0.0	21.3	40.5							12.1	21.5	0.0
Cycle Q Clear(g_c), s	0.0	21.3	40.5							12.1	21.5	0.0
Prop In Lane	0.00		1.00							1.00		0.00
Lane Grp Cap(c), veh/h	0	2406	1364							406	852	0
V/C Ratio(X)	0.00	0.57	1.15							0.59	1.35	0.00
Avail Cap(c_a), veh/h	0	2406	1364							406	852	0
HCM Platoon Ratio	1.00	0.33	0.33							0.33	0.33	1.00
Upstream Filter(I)	0.00	0.09	0.09							0.78	0.78	0.00
Uniform Delay (d), s/veh	0.0	22.9	30.8							29.7	34.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	69.0							1.8	164.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.8	27.2							5.0	28.3	0.0
LnGrp Delay(d),s/veh	0.0	23.0	99.8							31.5	198.7	0.0
LnGrp LOS		C	F							C	F	
Approach Vol, veh/h		2950									1391	
Approach Delay, s/veh		63.9									170.0	
Approach LOS		E									F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		49.0		26.0								
Change Period (Y+Rc), s		8.5		4.5								
Max Green Setting (Gmax), s		40.5		21.5								
Max Q Clear Time (g_c+I1), s		42.5		23.5								
Green Ext Time (p_c), s		0.0		0.0								
Intersection Summary												
HCM 2010 Ctrl Delay			97.9									
HCM 2010 LOS			F									
Notes												





















HCM 2010 Signalized Intersection Summary
30: Irwin & 2nd St

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						  				
Traffic Volume (veh/h)	780	880	0	0	0	0	0	1497	500	0	0	0
Future Volume (veh/h)	780	880	0	0	0	0	0	1497	500	0	0	0
Number	5	2	12				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1454	1485	0				0	1398	1398			
Adj Flow Rate, veh/h	848	957	0				0	1627	489			
Adj No. of Lanes	2	2	0				0	3	1			
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0				0	3	3			
Cap, veh/h	1551	1458	0				0	1466	451			
Arrive On Green	0.16	0.16	0.00				0.00	0.38	0.38			
Sat Flow, veh/h	2769	2971	0				0	3943	1174			
Grp Volume(v), veh/h	848	957	0				0	1627	489			
Grp Sat Flow(s),veh/h/ln	1385	1485	0				0	1272	1174			
Q Serve(g_s), s	21.4	22.7	0.0				0.0	28.8	28.8			
Cycle Q Clear(g_c), s	21.4	22.7	0.0				0.0	28.8	28.8			
Prop In Lane	1.00		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	1551	1458	0				0	1466	451			
V/C Ratio(X)	0.55	0.66	0.00				0.00	1.11	1.08			
Avail Cap(c_a), veh/h	1551	1458	0				0	1466	451			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	0.34	0.34	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	25.0	25.5	0.0				0.0	23.1	23.1			
Incr Delay (d2), s/veh	0.5	0.8	0.0				0.0	59.8	67.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.3	9.5	0.0				0.0	18.2	17.7			
LnGrp Delay(d),s/veh	25.5	26.3	0.0				0.0	82.9	90.1			
LnGrp LOS	C	C						F	F			
Approach Vol, veh/h		1805						2116				
Approach Delay, s/veh		25.9						84.6				
Approach LOS		C						F				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		41.0		34.0								
Change Period (Y+Rc), s		* 4.2		* 5.2								
Max Green Setting (Gmax), s		* 37		* 29								
Max Q Clear Time (g_c+I1), s		24.7		30.8								
Green Ext Time (p_c), s		10.3		0.0								
Intersection Summary												
HCM 2010 Ctrl Delay			57.6									
HCM 2010 LOS			E									
Notes												

HCM 2010 Signalized Intersection Summary
31: Lindaro & Andersen

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour

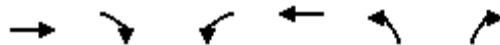
												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	20	330	50	10	80	220	64	60	300	160	71	222
Future Volume (veh/h)	20	330	50	10	80	220	64	60	300	160	71	222
Number	5	2	12		1	6	16	3	8	18	7	4
Initial Q (Qb), veh	0	0	0		0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94		1.00		0.97	1.00		0.97	1.00	
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	2019	2019	2000		1942	1942	2000	1845	1845	1900	1845	1845
Adj Flow Rate, veh/h	22	359	46		87	239	58	65	326	150	77	241
Adj No. of Lanes	1	1	0		1	1	0	1	1	0	1	1
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
Percent Heavy Veh, %	3	3	3		3	3	3	3	3	3	3	3
Cap, veh/h	58	433	56		153	453	110	164	376	173	178	548
Arrive On Green	0.03	0.25	0.25		0.08	0.30	0.30	0.09	0.32	0.32	0.10	0.33
Sat Flow, veh/h	1923	1741	223		1849	1501	364	1757	1183	545	1757	1683
Grp Volume(v), veh/h	22	0	405		87	0	297	65	0	476	77	0
Grp Sat Flow(s),veh/h/ln	1923	0	1965		1849	0	1865	1757	0	1728	1757	0
Q Serve(g_s), s	0.8	0.0	13.4		3.1	0.0	9.1	2.4	0.0	17.8	2.8	0.0
Cycle Q Clear(g_c), s	0.8	0.0	13.4		3.1	0.0	9.1	2.4	0.0	17.8	2.8	0.0
Prop In Lane	1.00		0.11		1.00		0.20	1.00		0.32	1.00	
Lane Grp Cap(c), veh/h	58	0	489		153	0	562	164	0	549	178	0
V/C Ratio(X)	0.38	0.00	0.83		0.57	0.00	0.53	0.40	0.00	0.87	0.43	0.00
Avail Cap(c_a), veh/h	225	0	634		270	0	657	231	0	677	231	0
HCM Platoon Ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00		1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.6	0.0	24.3		30.2	0.0	19.9	29.2	0.0	22.0	28.9	0.0
Incr Delay (d2), s/veh	1.5	0.0	7.1		1.2	0.0	0.8	0.6	0.0	9.9	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	8.2		1.6	0.0	4.7	1.2	0.0	10.0	1.4	0.0
LnGrp Delay(d),s/veh	34.1	0.0	31.4		31.5	0.0	20.6	29.8	0.0	31.9	29.5	0.0
LnGrp LOS	C		C		C		C	C		C	C	
Approach Vol, veh/h		427				384			541			336
Approach Delay, s/veh		31.5				23.1			31.6			21.2
Approach LOS		C				C			C			C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.7	21.9	10.4	26.5	6.1	25.5	10.9	25.9				
Change Period (Y+Rc), s	4.0	4.9	4.0	* 4.2	4.0	4.9	4.0	* 4.2				
Max Green Setting (Gmax), s	10.0	22.1	9.0	* 27	8.0	24.1	9.0	* 27				
Max Q Clear Time (g_c+I1), s	5.1	15.4	4.4	9.7	2.8	11.1	4.8	19.8				
Green Ext Time (p_c), s	0.1	1.0	0.0	0.9	0.0	0.9	0.0	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			27.6									
HCM 2010 LOS			C									
Notes												

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	20
Future Volume (veh/h)	20
Number	14
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	0.92
Parking Bus, Adj	1.00
Adj Sat Flow, veh/h/ln	1900
Adj Flow Rate, veh/h	18
Adj No. of Lanes	0
Peak Hour Factor	0.92
Percent Heavy Veh, %	3
Cap, veh/h	41
Arrive On Green	0.33
Sat Flow, veh/h	126
Grp Volume(v), veh/h	259
Grp Sat Flow(s),veh/h/ln	1809
Q Serve(g_s), s	7.7
Cycle Q Clear(g_c), s	7.7
Prop In Lane	0.07
Lane Grp Cap(c), veh/h	589
V/C Ratio(X)	0.44
Avail Cap(c_a), veh/h	708
HCM Platoon Ratio	1.00
Upstream Filter(l)	1.00
Uniform Delay (d), s/veh	18.2
Incr Delay (d2), s/veh	0.5
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	3.9
LnGrp Delay(d),s/veh	18.7
LnGrp LOS	B
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	

HCM Signalized Intersection Capacity Analysis

32: Tamalpais & Mission

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻		
Traffic Volume (vph)	585	75	0	740	0	0
Future Volume (vph)	585	75	0	740	0	0
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.6			3.0		
Lane Util. Factor	1.00			1.00		
Frbp, ped/bikes	0.99			1.00		
Flpb, ped/bikes	1.00			1.00		
Frt	0.98			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	1540			1573		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	1540			1573		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	636	82	0	804	0	0
RTOR Reduction (vph)	6	0	0	0	0	0
Lane Group Flow (vph)	712	0	0	804	0	0
Confl. Peds. (#/hr)	10		10	10		
Turn Type	NA			NA		
Protected Phases	2			3 4 6		
Permitted Phases						
Actuated Green, G (s)	34.4			51.8		
Effective Green, g (s)	34.4			46.2		
Actuated g/C Ratio	0.46			0.62		
Clearance Time (s)	5.6					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	706			968		
v/s Ratio Prot	c0.46			c0.51		
v/s Ratio Perm						
v/c Ratio	1.01			0.83		
Uniform Delay, d1	20.3			11.3		
Progression Factor	0.97			0.51		
Incremental Delay, d2	30.6			0.6		
Delay (s)	50.4			6.3		
Level of Service	D			A		
Approach Delay (s)	50.4			6.3		0.0
Approach LOS	D			A		A
Intersection Summary						
HCM 2000 Control Delay	27.1			HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio	0.79					
Actuated Cycle Length (s)	75.0			Sum of lost time (s)		19.0
Intersection Capacity Utilization	102.6%			ICU Level of Service		G
Analysis Period (min)	15					
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
33: Tamalpais & 5th

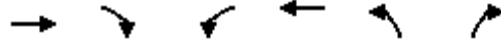
Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↑						↕	
Traffic Volume (vph)	0	390	50	0	380	0	0	0	0	20	20	30
Future Volume (vph)	0	390	50	0	380	0	0	0	0	20	20	30
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.6			5.6						5.6	
Lane Util. Factor		1.00			1.00						1.00	
Frbp, ped/bikes		0.99			1.00						0.98	
Flpb, ped/bikes		1.00			1.00						1.00	
Frt		0.98			1.00						0.94	
Flt Protected		1.00			1.00						0.99	
Satd. Flow (prot)		1541			1573						1432	
Flt Permitted		1.00			1.00						0.99	
Satd. Flow (perm)		1541			1573						1432	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	424	54	0	413	0	0	0	0	22	22	33
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	29	0
Lane Group Flow (vph)	0	473	0	0	413	0	0	0	0	0	48	0
Confl. Peds. (#/hr)	10		10	10		10	10					10
Turn Type		NA			NA					Perm	NA	
Protected Phases		2			4	6					8	
Permitted Phases										8		
Actuated Green, G (s)		39.3			55.7						8.1	
Effective Green, g (s)		39.3			55.7						8.1	
Actuated g/C Ratio		0.52			0.74						0.11	
Clearance Time (s)		5.6									5.6	
Vehicle Extension (s)		3.0									1.5	
Lane Grp Cap (vph)		807			1168						154	
v/s Ratio Prot		c0.31			c0.26							
v/s Ratio Perm											0.03	
v/c Ratio		0.59			0.35						0.31	
Uniform Delay, d1		12.3			3.4						30.9	
Progression Factor		0.57			0.09						0.85	
Incremental Delay, d2		1.8			0.1						0.0	
Delay (s)		8.8			0.4						26.2	
Level of Service		A			A						C	
Approach Delay (s)		8.8			0.4			0.0			26.2	
Approach LOS		A			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			6.6									A
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			75.0							16.8		
Intersection Capacity Utilization			80.3%									D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 34: Tamalpais & Mission

Cumulative Plus Project Buildout
 Timing Plan: AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Traffic Volume (vph)	585	0	0	730	10	20
Future Volume (vph)	585	0	0	730	10	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.6			5.6	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.91	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	1573			1573	1408	
Flt Permitted	1.00			1.00	0.98	
Satd. Flow (perm)	1573			1573	1408	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	636	0	0	793	11	22
RTOR Reduction (vph)	0	0	0	0	19	0
Lane Group Flow (vph)	636	0	0	793	14	0
Confl. Peds. (#/hr)		10				
Turn Type	NA			NA	Prot	
Protected Phases	2 8			6	3 4	
Permitted Phases						
Actuated Green, G (s)	52.4			34.4	11.8	
Effective Green, g (s)	47.2			34.4	11.8	
Actuated g/C Ratio	0.63			0.46	0.16	
Clearance Time (s)				5.6		
Vehicle Extension (s)				3.0		
Lane Grp Cap (vph)	989			721	221	
v/s Ratio Prot	c0.40			c0.50	c0.01	
v/s Ratio Perm						
v/c Ratio	0.64			1.10	0.07	
Uniform Delay, d1	8.7			20.3	26.9	
Progression Factor	0.45			1.16	1.05	
Incremental Delay, d2	0.1			57.1	0.0	
Delay (s)	4.0			80.6	28.4	
Level of Service	A			F	C	
Approach Delay (s)	4.0			80.6	28.4	
Approach LOS	A			F	C	

Intersection Summary			
HCM 2000 Control Delay	46.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	102.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

35: Tamalpais & 5th

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑			↑				
Traffic Volume (vph)	0	410	0	0	350	20	30	10	30	0	0	0
Future Volume (vph)	0	410	0	0	350	20	30	10	30	0	0	0
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.6			5.6			5.6				
Lane Util. Factor		1.00			1.00			1.00				
Frbp, ped/bikes		1.00			1.00			0.98				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.99			0.94				
Flt Protected		1.00			1.00			0.98				
Satd. Flow (prot)		1573			1557			1422				
Flt Permitted		1.00			1.00			0.98				
Satd. Flow (perm)		1573			1557			1422				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	446	0	0	380	22	33	11	33	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	28	0	0	0	0
Lane Group Flow (vph)	0	446	0	0	400	0	0	49	0	0	0	0
Confl. Peds. (#/hr)	10					10			10			
Turn Type		NA			NA		Split	NA				
Protected Phases		2 8			6		4	4				
Permitted Phases												
Actuated Green, G (s)		53.0			39.3			10.8				
Effective Green, g (s)		53.0			39.3			10.8				
Actuated g/C Ratio		0.71			0.52			0.14				
Clearance Time (s)					5.6			5.6				
Vehicle Extension (s)					3.0			1.5				
Lane Grp Cap (vph)		1111			815			204				
v/s Ratio Prot		c0.28			c0.26			c0.03				
v/s Ratio Perm												
v/c Ratio		0.40			0.49			0.24				
Uniform Delay, d1		4.5			11.4			28.5				
Progression Factor		0.02			0.65			1.26				
Incremental Delay, d2		0.1			2.0			0.1				
Delay (s)		0.1			9.3			36.1				
Level of Service		A			A			D				
Approach Delay (s)		0.1			9.3			36.1			0.0	
Approach LOS		A			A			D			A	
Intersection Summary												
HCM 2000 Control Delay			7.1				HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			75.0				Sum of lost time (s)		16.8			
Intersection Capacity Utilization			80.3%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis




















36: Tamalpais & 4th

Cumulative Plus Project Buildout
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↔			↕				
Traffic Volume (vph)	0	500	0	0	420	70	10	10	10	0	0	0
Future Volume (vph)	0	500	0	0	420	70	10	10	10	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.6			5.6			5.6				
Lane Util. Factor		1.00			1.00			1.00				
Frbp, ped/bikes		1.00			0.98			0.99				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.98			0.95				
Flt Protected		1.00			1.00			0.98				
Satd. Flow (prot)		1573			1517			1464				
Flt Permitted		1.00			1.00			0.98				
Satd. Flow (perm)		1573			1517			1464				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	543	0	0	457	76	11	11	11	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	9	0	0	0	0
Lane Group Flow (vph)	0	543	0	0	525	0	0	24	0	0	0	0
Confl. Peds. (#/hr)	39		22			39			10			
Turn Type		NA			NA		Split	NA				
Protected Phases		2 8			6		4	4				
Permitted Phases												
Actuated Green, G (s)		50.3			30.9			13.9				
Effective Green, g (s)		50.3			30.9			13.9				
Actuated g/C Ratio		0.67			0.41			0.19				
Clearance Time (s)					5.6			5.6				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)		1054			625			271				
v/s Ratio Prot		c0.35			c0.35			c0.02				
v/s Ratio Perm												
v/c Ratio		0.52			0.84			0.09				
Uniform Delay, d1		6.2			19.8			25.3				
Progression Factor		0.07			0.98			1.01				
Incremental Delay, d2		0.4			11.5			0.1				
Delay (s)		0.8			30.9			25.7				
Level of Service		A			C			C				
Approach Delay (s)		0.8			30.9			25.7			0.0	
Approach LOS		A			C			C			A	
Intersection Summary												
HCM 2000 Control Delay			16.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			75.0				Sum of lost time (s)		16.4			
Intersection Capacity Utilization			97.1%				ICU Level of Service		F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
1: Lincoln & Mission

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	495	20	70	550	70	40	526	60	0	401	320
Future Volume (veh/h)	280	495	20	70	550	70	40	526	60	0	401	320
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	0.99		0.93	1.00		0.95
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1676	1676	1710	1676	1676	1710	1800	1694	1728	0	1765	1728
Adj Flow Rate, veh/h	292	516	19	73	573	67	42	548	52	0	418	144
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	0	2	2
Cap, veh/h	279	943	35	397	551	64	97	1036	96	0	938	318
Arrive On Green	0.17	0.59	0.59	0.75	0.75	0.75	0.77	0.77	0.77	0.00	0.39	0.39
Sat Flow, veh/h	1597	1606	59	819	1469	172	119	2673	248	0	2508	822
Grp Volume(v), veh/h	292	0	535	73	0	640	332	0	310	0	288	274
Grp Sat Flow(s),veh/h/ln	1597	0	1665	819	0	1641	1562	0	1477	0	1676	1565
Q Serve(g_s), s	14.0	0.0	15.6	2.2	0.0	30.0	0.0	0.0	6.5	0.0	10.2	10.4
Cycle Q Clear(g_c), s	14.0	0.0	15.6	2.2	0.0	30.0	5.8	0.0	6.5	0.0	10.2	10.4
Prop In Lane	1.00		0.04	1.00		0.10	0.13		0.17	0.00		0.53
Lane Grp Cap(c), veh/h	279	0	978	397	0	615	656	0	572	0	650	606
V/C Ratio(X)	1.05	0.00	0.55	0.18	0.00	1.04	0.51	0.00	0.54	0.00	0.44	0.45
Avail Cap(c_a), veh/h	279	0	978	397	0	615	656	0	572	0	650	606
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.76	0.00	0.76	0.75	0.00	0.75	0.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	0.0	10.0	6.5	0.0	10.0	6.2	0.0	6.2	0.0	18.1	18.2
Incr Delay (d2), s/veh	66.1	0.0	2.2	0.8	0.0	42.5	2.1	0.0	2.7	0.0	2.2	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.3	0.0	7.7	0.6	0.0	19.9	3.0	0.0	2.8	0.0	5.1	4.9
LnGrp Delay(d),s/veh	99.1	0.0	12.2	7.3	0.0	52.5	8.3	0.0	9.0	0.0	20.3	20.6
LnGrp LOS	F		B	A		F	A		A		C	C
Approach Vol, veh/h		827			713			642			562	
Approach Delay, s/veh		42.9			47.9			8.6			20.5	
Approach LOS		D			D			A			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		51.2		35.8	17.0	34.2		35.8				
Change Period (Y+Rc), s		* 4.2		4.6	3.0	* 4.2		4.6				
Max Green Setting (Gmax), s		* 47		24.4	14.0	* 30		24.4				
Max Q Clear Time (g_c+I1), s		17.6		8.5	16.0	32.0		12.4				
Green Ext Time (p_c), s		5.8		5.2	0.0	0.0		3.8				
Intersection Summary												
HCM 2010 Ctrl Delay				31.6								
HCM 2010 LOS				C								
Notes												

HCM Signalized Intersection Capacity Analysis
2: Hetherton & Mission

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑						↑↑	↑
Traffic Volume (vph)	0	490	50	40	180	0	0	0	0	250	1233	495
Future Volume (vph)	0	490	50	40	180	0	0	0	0	250	1233	495
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	10	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		0.95			1.00						0.95	1.00
Frbp, ped/bikes		1.00			1.00						1.00	0.98
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.99			1.00						1.00	0.85
Flt Protected		1.00			0.99						0.99	1.00
Satd. Flow (prot)		2769			1781						2992	1321
Flt Permitted		1.00			0.80						0.99	1.00
Satd. Flow (perm)		2769			1431						2992	1321
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	510	52	42	188	0	0	0	0	260	1284	516
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	553	0	0	230	0	0	0	0	0	1544	516
Confl. Peds. (#/hr)			15	15		4			11			
Confl. Bikes (#/hr)			3			3			3			2
Turn Type		NA		Perm	NA					Split	NA	custom
Protected Phases		4			8					2	2	
Permitted Phases				8								5
Actuated Green, G (s)		22.8			22.8						48.4	41.4
Effective Green, g (s)		22.8			22.8						48.4	41.4
Actuated g/C Ratio		0.29			0.29						0.60	0.52
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		789			407						1810	683
v/s Ratio Prot		c0.20									c0.52	
v/s Ratio Perm					0.16							0.39
v/c Ratio		0.70			0.57						0.85	0.76
Uniform Delay, d1		25.5			24.4						12.9	15.3
Progression Factor		0.47			0.44						1.00	1.00
Incremental Delay, d2		4.5			4.7						5.3	7.6
Delay (s)		16.6			15.5						18.2	22.9
Level of Service		B			B						B	C
Approach Delay (s)		16.6			15.5			0.0			19.4	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			18.5		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				10.8			
Intersection Capacity Utilization			98.9%		ICU Level of Service				F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Irwin & Mission





















Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour



Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations		↔	↑	↑	↔			↕	↔	
Traffic Volume (vph)	400	20	320	145	320	20	70	1630	200	60
Future Volume (vph)	400	20	320	145	320	20	70	1630	200	60
Ideal Flow (vphpl)	2200	1800	2200	2200	2200	1800	2200	2200	1800	2200
Lane Width	9	12	10	10	9	12	12	12	12	12
Total Lost time (s)		4.2	4.2	4.2	4.2			4.2	4.2	
Lane Util. Factor		1.00	1.00	1.00	1.00			0.95	1.00	
Frbp, ped/bikes		1.00	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	
Frt		1.00	1.00	1.00	0.85			1.00	0.85	
Flt Protected		0.95	1.00	1.00	1.00			1.00	1.00	
Satd. Flow (prot)		1509	1812	1812	1485			3678	1316	
Flt Permitted		0.62	1.00	1.00	1.00			1.00	1.00	
Satd. Flow (perm)		986	1812	1812	1485			3678	1316	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	417	21	333	151	333	21	73	1698	208	62
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	39	0
Lane Group Flow (vph)	0	438	333	151	354	0	0	1771	232	0
Confl. Peds. (#/hr)							8			3
Confl. Bikes (#/hr)					4	4				
Turn Type	pm+pt	pm+pt	NA	NA	Prot		Perm	NA	Perm	
Protected Phases	5	5	2	6	6			4		
Permitted Phases	2	2					4			4
Actuated Green, G (s)		33.8	33.8	18.8	18.8			37.8	37.8	
Effective Green, g (s)		33.8	33.8	18.8	18.8			37.8	37.8	
Actuated g/C Ratio		0.42	0.42	0.24	0.24			0.47	0.47	
Clearance Time (s)		4.2	4.2	4.2	4.2			4.2	4.2	
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0	
Lane Grp Cap (vph)		487	765	425	348			1737	621	
v/s Ratio Prot		c0.12	0.18	0.08	c0.24					
v/s Ratio Perm		0.26						0.48	0.18	
v/c Ratio		0.90	0.44	0.36	1.02			1.02	0.37	
Uniform Delay, d1		21.5	16.3	25.5	30.6			21.1	13.5	
Progression Factor		0.69	0.79	1.00	1.00			0.48	0.24	
Incremental Delay, d2		13.4	0.3	0.5	52.7			20.3	0.8	
Delay (s)		28.2	13.2	26.1	83.3			30.5	4.1	
Level of Service		C	B	C	F			C	A	
Approach Delay (s)			21.7	66.2				27.0		
Approach LOS			C	E				C		
Intersection Summary										
HCM 2000 Control Delay			31.7					HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			1.02							
Actuated Cycle Length (s)			80.0					Sum of lost time (s)		12.6
Intersection Capacity Utilization			103.2%					ICU Level of Service		G
Analysis Period (min)			15							
c	Critical Lane Group									

HCM 2010 Signalized Intersection Summary
4: Lincoln & 5th

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	400	40	30	245	65	60	471	90	90	361	40
Future Volume (veh/h)	90	400	40	30	245	65	60	471	90	90	361	40
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	1.00		0.97	0.98		0.93	0.98		0.93
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1412	1560	1530	1412	1500	1530	1440	1500	1469	1440	1500	1469
Adj Flow Rate, veh/h	94	417	38	31	255	56	62	491	76	94	376	34
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	427	622	57	244	525	115	137	934	142	222	813	75
Arrive On Green	0.44	0.44	0.44	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Sat Flow, veh/h	846	1405	128	745	1185	260	188	2111	320	360	1837	169
Grp Volume(v), veh/h	94	0	455	31	0	311	325	0	304	239	0	265
Grp Sat Flow(s),veh/h/ln	846	0	1533	745	0	1446	1339	0	1280	1046	0	1321
Q Serve(g_s), s	6.0	0.0	18.8	2.1	0.0	3.5	0.0	0.0	4.2	0.9	0.0	3.1
Cycle Q Clear(g_c), s	9.5	0.0	18.8	20.9	0.0	3.5	3.5	0.0	4.2	5.1	0.0	3.1
Prop In Lane	1.00		0.08	1.00		0.18	0.19		0.25	0.39		0.13
Lane Grp Cap(c), veh/h	427	0	679	244	0	640	646	0	567	526	0	584
V/C Ratio(X)	0.22	0.00	0.67	0.13	0.00	0.49	0.50	0.00	0.54	0.45	0.00	0.45
Avail Cap(c_a), veh/h	427	0	679	244	0	640	646	0	567	526	0	584
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.97	0.00	0.97	0.82	0.00	0.82	0.68	0.00	0.68
Uniform Delay (d), s/veh	16.3	0.0	17.7	9.8	0.0	2.8	2.8	0.0	2.8	2.7	0.0	2.7
Incr Delay (d2), s/veh	1.2	0.0	5.2	1.0	0.0	2.5	2.3	0.0	3.0	1.9	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	8.8	0.5	0.0	1.7	1.7	0.0	1.7	1.1	0.0	1.3
LnGrp Delay(d),s/veh	17.4	0.0	22.9	10.8	0.0	5.3	5.1	0.0	5.8	4.6	0.0	4.5
LnGrp LOS	B		C	B		A	A		A	A		A
Approach Vol, veh/h		549			342			629			504	
Approach Delay, s/veh		22.0			5.8			5.4			4.5	
Approach LOS		C			A			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		40.0		40.0		40.0		40.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		35.4		35.4		35.4		35.4				
Max Q Clear Time (g_c+I1), s		20.8		6.2		22.9		7.1				
Green Ext Time (p_c), s		2.4		3.0		1.2		2.5				
Intersection Summary												
HCM 2010 Ctrl Delay			9.8									
HCM 2010 LOS			A									

HCM Signalized Intersection Capacity Analysis

5: Hetherton & 5th


















Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↕↕↕	↕
Traffic Volume (vph)	0	360	190	70	180	0	0	0	0	50	1133	140
Future Volume (vph)	0	360	190	70	180	0	0	0	0	50	1133	140
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)		4.2			4.2						4.6	4.6
Lane Util. Factor		1.00			1.00						0.91	1.00
Frbp, ped/bikes		0.99			1.00						1.00	0.95
Flpb, ped/bikes		1.00			1.00						1.00	1.00
Frt		0.95			1.00						1.00	0.85
Flt Protected		1.00			0.99						1.00	1.00
Satd. Flow (prot)		1700			1773						4164	1147
Flt Permitted		1.00			0.66						1.00	1.00
Satd. Flow (perm)		1700			1178						4164	1147
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	375	198	73	188	0	0	0	0	52	1180	146
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	564	0	0	261	0	0	0	0	0	1232	146
Confl. Peds. (#/hr)	12		12	12		12			12	12		7
Confl. Bikes (#/hr)			6			4			2			2
Parking (#/hr)											2	2
Turn Type		NA		Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases				8						2		5
Actuated Green, G (s)		39.8			39.8						31.4	24.4
Effective Green, g (s)		39.8			39.8						31.4	24.4
Actuated g/C Ratio		0.50			0.50						0.39	0.30
Clearance Time (s)		4.2			4.2						4.6	4.6
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		845			586						1634	349
v/s Ratio Prot		c0.33										
v/s Ratio Perm					0.22						0.30	0.13
v/c Ratio		0.67			0.45						0.75	0.42
Uniform Delay, d1		15.1			13.0						21.0	22.1
Progression Factor		0.34			0.99						0.68	0.75
Incremental Delay, d2		3.9			1.9						1.7	1.9
Delay (s)		8.9			14.7						16.0	18.5
Level of Service		A			B						B	B
Approach Delay (s)		8.9			14.7			0.0			16.2	
Approach LOS		A			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			14.2								HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			80.0								Sum of lost time (s)	10.8
Intersection Capacity Utilization			95.3%								ICU Level of Service	F
Analysis Period (min)			15									
c Critical Lane Group												




















HCM 2010 Signalized Intersection Summary
6: Irwin & 5th

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	160	0	0	140	120	100	1555	20	0	0	0
Future Volume (veh/h)	270	160	0	0	140	120	100	1555	20	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.96			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1588	1588	0	0	1588	1620	1620	1588	1620			
Adj Flow Rate, veh/h	281	167	0	0	146	121	104	1620	19			
Adj No. of Lanes	1	1	0	0	1	0	0	3	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	2	0	2	0			
Cap, veh/h	365	683	0	0	296	245	117	1951	24			
Arrive On Green	0.72	0.72	0.00	0.00	0.43	0.43	0.15	0.15	0.15			
Sat Flow, veh/h	993	1588	0	0	688	570	258	4288	52			
Grp Volume(v), veh/h	281	167	0	0	0	267	635	530	578			
Grp Sat Flow(s),veh/h/ln	993	1588	0	0	0	1258	1575	1445	1577			
Q Serve(g_s), s	22.1	2.9	0.0	0.0	0.0	12.3	31.6	28.4	28.4			
Cycle Q Clear(g_c), s	34.4	2.9	0.0	0.0	0.0	12.3	31.6	28.4	28.4			
Prop In Lane	1.00		0.00	0.00		0.45	0.16		0.03			
Lane Grp Cap(c), veh/h	365	683	0	0	0	541	717	658	717			
V/C Ratio(X)	0.77	0.24	0.00	0.00	0.00	0.49	0.89	0.81	0.81			
Avail Cap(c_a), veh/h	365	683	0	0	0	541	717	658	717			
HCM Platoon Ratio	1.67	1.67	1.00	1.00	1.00	1.00	0.33	0.33	0.33			
Upstream Filter(I)	0.69	0.69	0.00	0.00	0.00	1.00	0.48	0.48	0.48			
Uniform Delay (d), s/veh	17.7	6.8	0.0	0.0	0.0	16.5	32.0	30.6	30.6			
Incr Delay (d2), s/veh	6.9	0.1	0.0	0.0	0.0	0.7	8.1	5.2	4.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.8	1.3	0.0	0.0	0.0	4.3	15.4	12.3	13.3			
LnGrp Delay(d),s/veh	24.5	7.0	0.0	0.0	0.0	17.2	40.1	35.7	35.3			
LnGrp LOS	C	A				B	D	D	D			
Approach Vol, veh/h		448			267			1743				
Approach Delay, s/veh		18.0			17.2			37.2				
Approach LOS		B			B			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		39.0		41.0		39.0						
Change Period (Y+Rc), s		4.6		4.6		4.6						
Max Green Setting (Gmax), s		34.4		36.4		34.4						
Max Q Clear Time (g_c+I1), s		36.4		33.6		14.3						
Green Ext Time (p_c), s		0.0		2.1		1.1						
Intersection Summary												
HCM 2010 Ctrl Delay				31.5								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary
7: Lincoln & 4th

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	245	40	115	280	155	30	431	90	50	311	70
Future Volume (veh/h)	50	245	40	115	280	155	30	431	90	50	311	70
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	0.97		0.90	0.93		0.83	0.97		0.83
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1588	1525	1620	1588	1588	1620	1620	1588	1555	1620	1588	1555
Adj Flow Rate, veh/h	52	255	34	120	292	135	31	449	73	52	324	52
Adj No. of Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	284	647	86	446	493	228	83	934	147	122	720	125
Arrive On Green	0.50	0.50	0.50	0.16	0.16	0.16	0.13	0.13	0.13	0.80	0.80	0.80
Sat Flow, veh/h	861	1300	173	949	991	458	84	2351	370	167	1810	315
Grp Volume(v), veh/h	52	0	289	120	0	427	298	0	255	210	0	218
Grp Sat Flow(s),veh/h/ln	861	0	1473	949	0	1450	1513	0	1291	975	0	1316
Q Serve(g_s), s	4.0	0.0	9.8	9.3	0.0	21.8	0.0	0.0	14.7	4.4	0.0	4.1
Cycle Q Clear(g_c), s	25.8	0.0	9.8	19.1	0.0	21.8	13.9	0.0	14.7	19.1	0.0	4.1
Prop In Lane	1.00		0.12	1.00		0.32	0.10		0.29	0.25		0.24
Lane Grp Cap(c), veh/h	284	0	733	446	0	721	651	0	513	444	0	523
V/C Ratio(X)	0.18	0.00	0.39	0.27	0.00	0.59	0.46	0.00	0.50	0.47	0.00	0.42
Avail Cap(c_a), veh/h	284	0	733	446	0	721	651	0	513	444	0	523
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	0.93	0.00	0.93	0.80	0.00	0.80	0.80	0.00	0.80
Uniform Delay (d), s/veh	25.6	0.0	12.6	29.3	0.0	25.9	27.0	0.0	27.3	6.7	0.0	5.4
Incr Delay (d2), s/veh	1.4	0.0	1.6	1.4	0.0	3.3	1.8	0.0	2.7	2.9	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	4.3	2.6	0.0	9.4	6.5	0.0	5.6	1.6	0.0	1.6
LnGrp Delay(d),s/veh	27.0	0.0	14.2	30.6	0.0	29.2	28.8	0.0	30.0	9.5	0.0	7.3
LnGrp LOS	C		B	C		C	C		C	A		A
Approach Vol, veh/h		341			547			553			428	
Approach Delay, s/veh		16.1			29.5			29.4			8.4	
Approach LOS		B			C			C			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		44.0		36.0		44.0		36.0				
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2		* 4.2				
Max Green Setting (Gmax), s		* 40		* 32		* 40		* 32				
Max Q Clear Time (g_c+I1), s		27.8		16.7		23.8		21.1				
Green Ext Time (p_c), s		2.3		4.3		4.8		2.7				
Intersection Summary												
HCM 2010 Ctrl Delay				22.2								
HCM 2010 LOS				C								
Notes												

HCM Signalized Intersection Capacity Analysis
8: 4th & Tamalpais

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Volume (vph)	0	465	440	0	0	120
Future Volume (vph)	0	465	440	0	0	120
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0	6.0			5.6
Lane Util. Factor		1.00	1.00			1.00
Frbp, ped/bikes		1.00	1.00			0.78
Flpb, ped/bikes		1.00	1.00			1.00
Frt		1.00	1.00			0.86
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		1588	1588			1074
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		1588	1588			1074
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	484	458	0	0	125
RTOR Reduction (vph)	0	0	0	0	0	104
Lane Group Flow (vph)	0	484	458	0	0	21
Confl. Peds. (#/hr)				59		78
Confl. Bikes (#/hr)				14		
Turn Type		NA	NA			Perm
Protected Phases		2 8	4 6			
Permitted Phases						8
Actuated Green, G (s)		54.9	55.1			13.3
Effective Green, g (s)		54.9	55.1			13.3
Actuated g/C Ratio		0.69	0.69			0.17
Clearance Time (s)						5.6
Vehicle Extension (s)						3.0
Lane Grp Cap (vph)		1089	1093			178
v/s Ratio Prot		c0.30	c0.29			
v/s Ratio Perm						0.02
v/c Ratio		0.44	0.42			0.12
Uniform Delay, d1		5.7	5.4			28.4
Progression Factor		0.95	0.15			1.00
Incremental Delay, d2		0.3	0.2			0.3
Delay (s)		5.7	1.0			28.6
Level of Service		A	A			C
Approach Delay (s)		5.7	1.0		28.6	
Approach LOS		A	A		C	
Intersection Summary						
HCM 2000 Control Delay			6.3		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.50			
Actuated Cycle Length (s)			80.0		Sum of lost time (s)	17.6
Intersection Capacity Utilization			95.9%		ICU Level of Service	F
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
9: Hetherton & 4th

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour





















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↖	↑						↑↑↑	↗
Traffic Volume (vph)	0	285	190	80	260	0	0	0	0	135	1053	205
Future Volume (vph)	0	285	190	80	260	0	0	0	0	135	1053	205
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	13	10	15	11	12	12	12	12	12	12	12
Total Lost time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Lane Util. Factor		1.00	1.00	1.00	1.00						0.91	1.00
Frbp, ped/bikes		1.00	0.93	1.00	1.00						1.00	0.92
Flpb, ped/bikes		1.00	1.00	0.97	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						0.99	1.00
Satd. Flow (prot)		1641	1172	1609	1535						4143	1102
Flt Permitted		1.00	1.00	0.47	1.00						0.99	1.00
Satd. Flow (perm)		1641	1172	792	1535						4143	1102
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	297	198	83	271	0	0	0	0	141	1097	214
RTOR Reduction (vph)	0	0	36	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	297	162	83	271	0	0	0	0	0	1238	214
Confl. Peds. (#/hr)			51	51		28			11	11		19
Confl. Bikes (#/hr)			10			16			1			1
Parking (#/hr)											2	2
Turn Type		NA	Perm	Perm	NA					Perm	NA	custom
Protected Phases		4			8						2	
Permitted Phases			4	8						2		5
Actuated Green, G (s)		29.8	29.8	29.8	29.8						41.4	34.4
Effective Green, g (s)		29.8	29.8	29.8	29.8						41.4	34.4
Actuated g/C Ratio		0.37	0.37	0.37	0.37						0.52	0.43
Clearance Time (s)		4.2	4.2	4.2	4.2						4.6	4.6
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		611	436	295	571						2144	473
v/s Ratio Prot		c0.18			0.18							
v/s Ratio Perm			0.14	0.10							0.30	0.19
v/c Ratio		0.49	0.37	0.28	0.47						0.58	0.45
Uniform Delay, d1		19.2	18.3	17.6	19.1						13.3	16.1
Progression Factor		0.56	0.40	0.93	0.95						0.36	0.49
Incremental Delay, d2		2.5	2.2	2.2	2.6						0.8	2.1
Delay (s)		13.3	9.5	18.5	20.7						5.5	10.0
Level of Service		B	A	B	C						A	B
Approach Delay (s)		11.8			20.2			0.0			6.2	
Approach LOS		B			C			A			A	

Intersection Summary		
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service A
HCM 2000 Volume to Capacity ratio	0.55	
Actuated Cycle Length (s)	80.0	Sum of lost time (s) 10.8
Intersection Capacity Utilization	78.5%	ICU Level of Service D
Analysis Period (min)	15	

c Critical Lane Group


















HCM 2010 Signalized Intersection Summary
10: Irwin & 4th

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	230	0	0	210	90	120	1410	170	0	0	0
Future Volume (veh/h)	180	230	0	0	210	90	120	1410	170	0	0	0
Number	5	2	12	1	6	16	7	4	14			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.95	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1588	1588	0	0	1588	1620	1525	1588	1620			
Adj Flow Rate, veh/h	188	240	0	0	219	83	125	1469	157			
Adj No. of Lanes	1	1	0	0	1	0	1	3	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	262	631	0	0	374	142	722	1977	211			
Arrive On Green	0.13	0.13	0.00	0.00	0.13	0.13	0.16	0.16	0.16			
Sat Flow, veh/h	963	1588	0	0	941	356	1452	3973	424			
Grp Volume(v), veh/h	188	240	0	0	0	302	125	1068	558			
Grp Sat Flow(s),veh/h/ln	963	1588	0	0	0	1297	1452	1445	1507			
Q Serve(g_s), s	14.3	11.1	0.0	0.0	0.0	17.5	5.9	28.2	28.2			
Cycle Q Clear(g_c), s	31.8	11.1	0.0	0.0	0.0	17.5	5.9	28.2	28.2			
Prop In Lane	1.00		0.00	0.00		0.27	1.00		0.28			
Lane Grp Cap(c), veh/h	262	631	0	0	0	516	722	1438	750			
V/C Ratio(X)	0.72	0.38	0.00	0.00	0.00	0.59	0.17	0.74	0.74			
Avail Cap(c_a), veh/h	262	631	0	0	0	516	722	1438	750			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	0.33	0.33	0.33	0.33	0.33			
Upstream Filter(I)	0.87	0.87	0.00	0.00	0.00	1.00	0.35	0.35	0.35			
Uniform Delay (d), s/veh	44.1	25.7	0.0	0.0	0.0	28.6	19.3	28.6	28.6			
Incr Delay (d2), s/veh	13.7	1.5	0.0	0.0	0.0	4.8	0.2	1.2	2.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.2	5.1	0.0	0.0	0.0	7.0	2.4	11.5	12.3			
LnGrp Delay(d),s/veh	57.9	27.3	0.0	0.0	0.0	33.4	19.5	29.8	30.9			
LnGrp LOS	E	C				C	B	C	C			
Approach Vol, veh/h		428			302			1751				
Approach Delay, s/veh		40.7			33.4			29.4				
Approach LOS		D			C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		36.0		44.0		36.0						
Change Period (Y+Rc), s		* 4.2		* 4.2		* 4.2						
Max Green Setting (Gmax), s		* 32		* 40		* 32						
Max Q Clear Time (g_c+I1), s		33.8		30.2		19.5						
Green Ext Time (p_c), s		0.0		6.0		1.0						
Intersection Summary												
HCM 2010 Ctrl Delay				31.8								
HCM 2010 LOS				C								
Notes												













HCM 2010 Signalized Intersection Summary
 11: D & 3rd

Cumulative Plus Project Buildout
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  						 	
Traffic Volume (veh/h)	0	0	0	335	1591	0	0	0	0	0	300	60
Future Volume (veh/h)	0	0	0	335	1591	0	0	0	0	0	300	60
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.94
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.82
Adj Sat Flow, veh/h/ln				1530	1500	0				0	1500	1530
Adj Flow Rate, veh/h				349	1657	0				0	312	43
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				509	2184	0				0	462	63
Arrive On Green				0.23	0.23	0.00				0.00	0.20	0.20
Sat Flow, veh/h				644	3302	0				0	2352	309
Grp Volume(v), veh/h				725	1281	0				0	193	162
Grp Sat Flow(s),veh/h/ln				1339	1242	0				0	1425	1161
Q Serve(g_s), s				40.8	38.4	0.0				0.0	10.0	10.3
Cycle Q Clear(g_c), s				40.8	38.4	0.0				0.0	10.0	10.3
Prop In Lane				0.48		0.00				0.00		0.27
Lane Grp Cap(c), veh/h				986	1707	0				0	289	236
V/C Ratio(X)				0.74	0.75	0.00				0.00	0.67	0.69
Avail Cap(c_a), veh/h				986	1707	0				0	417	339
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				0.45	0.45	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				25.5	24.5	0.0				0.0	29.4	29.5
Incr Delay (d2), s/veh				2.2	1.4	0.0				0.0	2.7	3.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				15.8	13.6	0.0				0.0	4.1	3.5
LnGrp Delay(d),s/veh				27.7	26.0	0.0				0.0	32.1	33.0
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					2006						355	
Approach Delay, s/veh					26.6						32.5	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		59.2		20.8								
Change Period (Y+Rc), s		* 4.2		4.6								
Max Green Setting (Gmax), s		* 48		23.4								
Max Q Clear Time (g_c+I1), s		42.8		12.3								
Green Ext Time (p_c), s		3.9		1.1								
Intersection Summary												
HCM 2010 Ctrl Delay				27.5								
HCM 2010 LOS				C								
Notes												













HCM 2010 Signalized Intersection Summary
12: C & 3rd

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑		↑↑				
Traffic Volume (veh/h)	0	0	0	0	1786	160	150	330	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1786	160	150	330	0	0	0	0
Number				5	2	12	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.98	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1412	1412	1440	1412	0			
Adj Flow Rate, veh/h				0	1860	133	156	344	0			
Adj No. of Lanes				0	3	1	0	2	0			
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %				0	2	2	2	2	0			
Cap, veh/h				0	2481	757	247	442	0			
Arrive On Green				0.00	0.21	0.21	0.08	0.08	0.00			
Sat Flow, veh/h				0	3981	1175	700	1822	0			
Grp Volume(v), veh/h				0	1860	133	270	230	0			
Grp Sat Flow(s),veh/h/ln				0	1285	1175	1237	1220	0			
Q Serve(g_s), s				0.0	36.2	7.4	16.9	14.7	0.0			
Cycle Q Clear(g_c), s				0.0	36.2	7.4	17.3	14.7	0.0			
Prop In Lane				0.00		1.00	0.58		0.00			
Lane Grp Cap(c), veh/h				0	2481	757	382	307	0			
V/C Ratio(X)				0.00	0.75	0.18	0.71	0.75	0.00			
Avail Cap(c_a), veh/h				0	2481	757	408	333	0			
HCM Platoon Ratio				1.00	0.33	0.33	0.33	0.33	1.00			
Upstream Filter(I)				0.00	0.27	0.27	0.74	0.74	0.00			
Uniform Delay (d), s/veh				0.0	25.5	14.1	35.4	34.2	0.0			
Incr Delay (d2), s/veh				0.0	0.6	0.1	3.9	6.3	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	13.0	2.4	6.3	5.5	0.0			
LnGrp Delay(d),s/veh				0.0	26.1	14.3	39.3	40.6	0.0			
LnGrp LOS					C	B	D	D				
Approach Vol, veh/h					1993			500				
Approach Delay, s/veh					25.3			39.9				
Approach LOS					C			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		55.7		24.3								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 50		* 22								
Max Q Clear Time (g_c+I1), s		38.2		19.3								
Green Ext Time (p_c), s		8.0		0.6								
Intersection Summary												
HCM 2010 Ctrl Delay				28.2								
HCM 2010 LOS				C								
Notes												

















HCM 2010 Signalized Intersection Summary
13: B & 3rd

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑						↑↑	
Traffic Volume (veh/h)	0	0	0	195	1851	0	0	0	0	0	290	100
Future Volume (veh/h)	0	0	0	195	1851	0	0	0	0	0	290	100
Number				5	2	12				7	4	14
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.85
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1440	1412	0				0	1412	1440
Adj Flow Rate, veh/h				203	1928	0				0	302	95
Adj No. of Lanes				0	3	0				0	2	0
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				272	2176	0				0	446	134
Arrive On Green				0.22	0.22	0.00				0.00	0.24	0.24
Sat Flow, veh/h				330	3453	0				0	1904	552
Grp Volume(v), veh/h				787	1344	0				0	217	180
Grp Sat Flow(s),veh/h/ln				1329	1169	0				0	1341	1044
Q Serve(g_s), s				44.3	44.6	0.0				0.0	11.7	12.6
Cycle Q Clear(g_c), s				46.2	44.6	0.0				0.0	11.7	12.6
Prop In Lane				0.26		0.00				0.00		0.53
Lane Grp Cap(c), veh/h				923	1524	0				0	326	254
V/C Ratio(X)				0.85	0.88	0.00				0.00	0.67	0.71
Avail Cap(c_a), veh/h				923	1524	0				0	389	303
HCM Platoon Ratio				0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)				0.46	0.46	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				29.0	28.4	0.0				0.0	27.3	27.7
Incr Delay (d2), s/veh				4.8	3.8	0.0				0.0	3.3	6.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				18.2	15.3	0.0				0.0	4.6	4.0
LnGrp Delay(d),s/veh				33.8	32.2	0.0				0.0	30.7	33.7
LnGrp LOS				C	C						C	C
Approach Vol, veh/h					2131						397	
Approach Delay, s/veh					32.8						32.0	
Approach LOS					C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		56.4		23.6								
Change Period (Y+Rc), s		* 4.2		* 4.2								
Max Green Setting (Gmax), s		* 48		* 23								
Max Q Clear Time (g_c+I1), s		48.2		14.6								
Green Ext Time (p_c), s		0.2		1.1								
Intersection Summary												
HCM 2010 Ctrl Delay				32.7								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary
14: A & 3rd

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	80	1696	100	260	175	0	0	180	50
Future Volume (veh/h)	0	0	0	80	1696	100	260	175	0	0	180	50
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.91	0.96		1.00	1.00		0.91
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1800	1765	1800	1853	1853	0	0	1853	1890
Adj Flow Rate, veh/h				83	1767	97	271	182	0	0	188	38
Adj No. of Lanes				0	3	0	1	1	0	0	1	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				108	2451	139	315	666	0	0	275	56
Arrive On Green				0.53	0.53	0.53	0.03	0.12	0.00	0.00	0.21	0.21
Sat Flow, veh/h				203	4587	259	1765	1853	0	0	1308	264
Grp Volume(v), veh/h				718	598	632	271	182	0	0	0	226
Grp Sat Flow(s),veh/h/ln				1755	1606	1689	1765	1853	0	0	0	1572
Q Serve(g_s), s				25.8	22.1	22.3	5.3	7.2	0.0	0.0	0.0	10.6
Cycle Q Clear(g_c), s				25.8	22.1	22.3	5.3	7.2	0.0	0.0	0.0	10.6
Prop In Lane				0.12		0.15	1.00		0.00	0.00		0.17
Lane Grp Cap(c), veh/h				937	858	902	315	666	0	0	0	330
V/C Ratio(X)				0.77	0.70	0.70	0.86	0.27	0.00	0.00	0.00	0.68
Avail Cap(c_a), veh/h				937	858	902	327	718	0	0	0	364
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	0.73	0.73	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				14.7	13.8	13.9	35.8	25.7	0.0	0.0	0.0	29.2
Incr Delay (d2), s/veh				5.9	4.7	4.5	16.4	0.3	0.0	0.0	0.0	6.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				13.9	10.7	11.3	7.4	3.7	0.0	0.0	0.0	5.2
LnGrp Delay(d),s/veh				20.6	18.5	18.4	52.2	26.1	0.0	0.0	0.0	35.9
LnGrp LOS				C	B	B	D	C				D
Approach Vol, veh/h					1947			453			226	
Approach Delay, s/veh					19.2			41.7			35.9	
Approach LOS					B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			11.5	21.3		47.2		32.8				
Change Period (Y+Rc), s			4.0	4.5		4.5		4.0				
Max Green Setting (Gmax), s			8.0	18.5		40.5		31.0				
Max Q Clear Time (g_c+I1), s			7.3	12.6		27.8		9.2				
Green Ext Time (p_c), s			0.1	0.8		11.1		1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			24.5									
HCM 2010 LOS			C									

Intersection 15 Brooks St/3rd St Side-street Stop
















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	42	40	94.2%	12.9	3.1	B
	Through	5	5	107.5%	12.9	13.1	B
	Right Turn						
	Subtotal	47	45	95.6%	13.3	2.6	B
SB	Left Turn						
	Through	15	13	84.5%	29.7	8.6	D
	Right Turn	10	7	65.3%	17.4	14.1	C
	Subtotal	25	19	76.8%	26.1	4.4	D
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	88	78	89.0%	2.8	0.2	A
	Through	1,829	1,782	97.4%	2.3	0.6	A
	Right Turn	10	10	96.0%	1.6	0.3	A
	Subtotal	1,927	1,870	97.0%	2.3	0.6	A
Total		1,999	1,934	96.8%	2.8	0.6	A

Intersection 16 Lindaro St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	132	123	93.4%	31.7	2.2	C
	Through	20	27	134.4%	31.4	6.1	C
	Right Turn						
	Subtotal	152	150	98.8%	31.7	2.7	C
SB	Left Turn						
	Through	50	58	116.0%	30.0	6.0	C
	Right Turn	10	12	115.2%	18.4	11.3	B
	Subtotal	60	70	115.8%	28.6	5.5	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	242	256	105.8%	10.4	4.1	B
	Through	1,872	1,796	95.9%	6.7	1.5	A
	Right Turn	40	38	95.0%	6.2	2.4	A
	Subtotal	2,154	2,090	97.0%	7.1	1.7	A
Total		2,366	2,310	97.6%	9.4	1.7	A


















HCM 2010 Signalized Intersection Summary
17: Lincoln & 3rd

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	110	1832	150	51	346	0	0	285	161
Future Volume (veh/h)	0	0	0	110	1832	150	51	346	0	0	285	161
Number				1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	0.98		1.00	1.00		0.82
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1620	1588	1620	1620	1588	0	0	1525	1555
Adj Flow Rate, veh/h				115	1908	145	53	360	0	0	297	162
Adj No. of Lanes				0	3	0	0	2	0	0	2	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				131	2303	179	102	660	0	0	532	273
Arrive On Green				0.19	0.19	0.19	0.62	0.62	0.00	0.00	0.10	0.10
Sat Flow, veh/h				227	3989	311	145	2200	0	0	1791	881
Grp Volume(v), veh/h				800	666	702	201	212	0	0	248	211
Grp Sat Flow(s),veh/h/ln				1577	1445	1504	900	1373	0	0	1448	1148
Q Serve(g_s), s				39.5	35.2	35.7	4.0	6.8	0.0	0.0	13.0	14.1
Cycle Q Clear(g_c), s				39.5	35.2	35.7	18.0	6.8	0.0	0.0	13.0	14.1
Prop In Lane				0.14		0.21	0.26		0.00	0.00		0.77
Lane Grp Cap(c), veh/h				911	835	869	336	426	0	0	449	356
V/C Ratio(X)				0.88	0.80	0.81	0.60	0.50	0.00	0.00	0.55	0.59
Avail Cap(c_a), veh/h				936	858	893	336	426	0	0	449	356
HCM Platoon Ratio				0.33	0.33	0.33	2.00	2.00	1.00	1.00	0.33	0.33
Upstream Filter(I)				0.28	0.28	0.28	1.00	1.00	0.00	0.00	0.88	0.88
Uniform Delay (d), s/veh				29.7	27.9	28.1	12.8	11.8	0.0	0.0	30.6	31.1
Incr Delay (d2), s/veh				2.9	1.5	1.6	7.7	4.1	0.0	0.0	4.3	6.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				18.0	14.5	15.3	2.9	3.0	0.0	0.0	5.8	5.1
LnGrp Delay(d),s/veh				32.6	29.4	29.7	20.5	15.9	0.0	0.0	34.9	37.4
LnGrp LOS				C	C	C	C	B			C	D
Approach Vol, veh/h					2168			413			459	
Approach Delay, s/veh					30.7			18.1			36.0	
Approach LOS					C			B			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				29.3		50.7		29.3				
Change Period (Y+Rc), s				4.5		4.5		4.5				
Max Green Setting (Gmax), s				23.5		47.5		23.5				
Max Q Clear Time (g_c+I1), s				20.0		41.5		16.1				
Green Ext Time (p_c), s				0.6		4.7		1.3				
Intersection Summary												
HCM 2010 Ctrl Delay				29.8								
HCM 2010 LOS				C								

HCM Signalized Intersection Capacity Analysis
18: Tamalpais & 3rd


















Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					  								
Traffic Volume (vph)	0	0	0	350	1952	50	125	55	0	0	0	0	
Future Volume (vph)	0	0	0	350	1952	50	125	55	0	0	0	0	
Ideal Flow (vphpl)	1800	1800	1800	1600	1600	1600	1600	1600	1800	1800	1600	1600	
Lane Width	12	12	12	12	12	12	11	12	12	12	12	12	
Total Lost time (s)					11.6		7.6	7.6					
Lane Util. Factor					0.91		1.00	1.00					
Frbp, ped/bikes					1.00		1.00	1.00					
Flpb, ped/bikes					0.96		0.96	1.00					
Frt					1.00		1.00	1.00					
Flt Protected					0.99		0.95	1.00					
Satd. Flow (prot)					3669		1098	1249					
Flt Permitted					0.99		0.95	1.00					
Satd. Flow (perm)					3669		1098	1249					
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0	0	0	365	2033	52	130	57	0	0	0	0	
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	2447	0	130	57	0	0	0	0	
Confl. Peds. (#/hr)			106	106		44	30		69			30	
Confl. Bikes (#/hr)						2			3			8	
Parking (#/hr)							3	3			3	3	
Turn Type				Perm	NA		Perm	NA					
Protected Phases					6			4					
Permitted Phases				6			4						
Actuated Green, G (s)					51.6		19.2	19.2					
Effective Green, g (s)					51.6		19.2	19.2					
Actuated g/C Ratio					0.57		0.21	0.21					
Clearance Time (s)					11.6		7.6	7.6					
Vehicle Extension (s)					5.0		5.0	5.0					
Lane Grp Cap (vph)					2103		234	266					
v/s Ratio Prot								0.05					
v/s Ratio Perm					0.67		c0.12						
v/c Ratio					1.16		0.56	0.21					
Uniform Delay, d1					19.2		31.6	29.2					
Progression Factor					1.00		1.00	1.00					
Incremental Delay, d2					79.4		4.8	0.8					
Delay (s)					98.6		36.4	30.0					
Level of Service					F		D	C					
Approach Delay (s)		0.0			98.6			34.4			0.0		
Approach LOS		A			F			C			A		
Intersection Summary													
HCM 2000 Control Delay			94.0		HCM 2000 Level of Service				F				
HCM 2000 Volume to Capacity ratio			1.00										
Actuated Cycle Length (s)			90.0		Sum of lost time (s)				19.2				
Intersection Capacity Utilization			163.8%		ICU Level of Service				H				
Analysis Period (min)			15										

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 19: Hetherton & 3rd













Cumulative Plus Project Buildout
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	510	1739	0	0	0	0	0	725	598
Future Volume (veh/h)	0	0	0	510	1739	0	0	0	0	0	725	598
Number				1	6	16				3	8	18
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.86
Parking Bus, Adj				1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1560	1588	0				0	1588	1500
Adj Flow Rate, veh/h				531	1811	0				0	755	615
Adj No. of Lanes				1	3	0				0	3	1
Peak Hour Factor				0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %				2	2	0				0	2	2
Cap, veh/h				717	2011	0				0	2018	509
Arrive On Green				0.14	0.14	0.00				0.00	0.15	0.15
Sat Flow, veh/h				1486	4765	0				0	4479	1093
Grp Volume(v), veh/h				531	1811	0				0	755	615
Grp Sat Flow(s),veh/h/ln				1486	1588	0				0	1445	1093
Q Serve(g_s), s				27.9	29.9	0.0				0.0	12.5	37.2
Cycle Q Clear(g_c), s				27.9	29.9	0.0				0.0	12.5	37.2
Prop In Lane				1.00		0.00				0.00		1.00
Lane Grp Cap(c), veh/h				717	2011	0				0	2018	509
V/C Ratio(X)				0.74	0.90	0.00				0.00	0.37	1.21
Avail Cap(c_a), veh/h				721	2025	0				0	2018	509
HCM Platoon Ratio				0.33	0.33	1.00				1.00	0.33	0.33
Upstream Filter(I)				0.09	0.09	0.00				0.00	0.82	0.82
Uniform Delay (d), s/veh				31.9	32.8	0.0				0.0	23.4	33.9
Incr Delay (d2), s/veh				0.4	0.6	0.0				0.0	0.4	108.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.6	13.3	0.0				0.0	5.1	26.6
LnGrp Delay(d),s/veh				32.3	33.4	0.0				0.0	23.8	142.6
LnGrp LOS				C	C						C	F
Approach Vol, veh/h					2342						1370	
Approach Delay, s/veh					33.1						77.1	
Approach LOS					C						E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs						6		8				
Phs Duration (G+Y+Rc), s						37.8		42.2				
Change Period (Y+Rc), s						4.0		5.0				
Max Green Setting (Gmax), s						34.0		37.0				
Max Q Clear Time (g_c+I1), s						31.9		39.2				
Green Ext Time (p_c), s						1.8		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay					49.4							
HCM 2010 LOS					D							
Notes												
User approved volume balancing among the lanes for turning movement.												

User approved ignoring U-Turning movement.




















HCM 2010 Signalized Intersection Summary
20: Irwin & 3rd/3rd St

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑	↑	↑↑↑				
Traffic Volume (veh/h)	0	0	0	0	1236	210	1008	1490	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1236	210	1008	1490	0	0	0	0
Number				1	6	16	7	4	14			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.93	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln				0	1500	1500	1398	1398	0			
Adj Flow Rate, veh/h				0	1288	200	1134	1434	0			
Adj No. of Lanes				0	3	1	2	2	0			
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %				0	2	2	3	3	0			
Cap, veh/h				0	1254	363	1548	1625	0			
Arrive On Green				0.00	0.31	0.31	0.19	0.19	0.00			
Sat Flow, veh/h				0	4230	1184	2663	2796	0			
Grp Volume(v), veh/h				0	1288	200	1134	1434	0			
Grp Sat Flow(s),veh/h/ln				0	1365	1184	1331	1398	0			
Q Serve(g_s), s				0.0	24.5	11.3	32.0	39.9	0.0			
Cycle Q Clear(g_c), s				0.0	24.5	11.3	32.0	39.9	0.0			
Prop In Lane				0.00		1.00	1.00		0.00			
Lane Grp Cap(c), veh/h				0	1254	363	1548	1625	0			
V/C Ratio(X)				0.00	1.03	0.55	0.73	0.88	0.00			
Avail Cap(c_a), veh/h				0	1254	363	1548	1625	0			
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00			
Upstream Filter(I)				0.00	1.00	1.00	0.09	0.09	0.00			
Uniform Delay (d), s/veh				0.0	27.8	23.2	26.5	29.7	0.0			
Incr Delay (d2), s/veh				0.0	32.5	1.8	0.3	0.7	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	13.0	3.8	11.9	15.6	0.0			
LnGrp Delay(d),s/veh				0.0	60.3	25.0	26.8	30.4	0.0			
LnGrp LOS					F	C	C	C				
Approach Vol, veh/h					1488			2568				
Approach Delay, s/veh					55.5			28.8				
Approach LOS					E			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				51.0		29.0						
Change Period (Y+Rc), s				4.5		4.5						
Max Green Setting (Gmax), s				46.5		24.5						
Max Q Clear Time (g_c+I1), s				41.9		26.5						
Green Ext Time (p_c), s				4.1		0.0						
Intersection Summary												
HCM 2010 Ctrl Delay				38.6								
HCM 2010 LOS				D								
Notes												













HCM 2010 Signalized Intersection Summary
21: D & 2nd

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  								 		
Traffic Volume (veh/h)	0	1627	110	0	0	0	0	0	435	185	470	0
Future Volume (veh/h)	0	1627	110	0	0	0	0	0	435	185	470	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.96	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1676	1710				0	1588	1620	1765	1765	0
Adj Flow Rate, veh/h	0	1695	106				0	0	439	193	490	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	0	0	0				0	0	575	238	781	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.44	0.15	0.15	0.00
Sat Flow, veh/h		0					0	0	1300	933	1765	0
Grp Volume(v), veh/h		0.0					0	0	439	193	490	0
Grp Sat Flow(s),veh/h/ln							0	0	1300	933	1765	0
Q Serve(g_s), s							0.0	0.0	22.7	12.7	20.9	0.0
Cycle Q Clear(g_c), s							0.0	0.0	22.7	35.4	20.9	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	575	238	781	0
V/C Ratio(X)							0.00	0.00	0.76	0.81	0.63	0.00
Avail Cap(c_a), veh/h							0	0	575	238	781	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)							0.00	0.00	1.00	0.74	0.74	0.00
Uniform Delay (d), s/veh							0.0	0.0	18.8	47.0	28.0	0.0
Incr Delay (d2), s/veh							0.0	0.0	5.4	13.7	0.9	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	8.9	5.2	10.4	0.0
LnGrp Delay(d),s/veh							0.0	0.0	24.2	60.7	28.9	0.0
LnGrp LOS									C	E	C	
Approach Vol, veh/h								439			683	
Approach Delay, s/veh								24.2			37.9	
Approach LOS								C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				40.0				40.0				
Change Period (Y+Rc), s				4.6				4.6				
Max Green Setting (Gmax), s				35.4				35.4				
Max Q Clear Time (g_c+I1), s				37.4				24.7				
Green Ext Time (p_c), s				0.0				1.1				
Intersection Summary												
HCM 2010 Ctrl Delay				32.5								
HCM 2010 LOS				C								













HCM 2010 Signalized Intersection Summary
22: C & 2nd

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑↑				
Traffic Volume (veh/h)	200	2052	0	0	0	0	0	260	120	0	0	0
Future Volume (veh/h)	200	2052	0	0	0	0	0	260	120	0	0	0
Number	1	6	16				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.97			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1440	1500	0				0	1500	1440			
Adj Flow Rate, veh/h	208	2138	0				0	271	118			
Adj No. of Lanes	0	3	0				0	2	0			
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0				0	2	2			
Cap, veh/h	299	2662	0				0	376	158			
Arrive On Green	0.23	0.23	0.00				0.00	0.19	0.19			
Sat Flow, veh/h	345	3798	0				0	1986	837			
Grp Volume(v), veh/h	819	1527	0				0	202	187			
Grp Sat Flow(s),veh/h/ln	1414	1365	0				0	1500	1324			
Q Serve(g_s), s	42.0	42.2	0.0				0.0	10.1	10.6			
Cycle Q Clear(g_c), s	44.0	42.2	0.0				0.0	10.1	10.6			
Prop In Lane	0.25		0.00				0.00		0.63			
Lane Grp Cap(c), veh/h	1047	1913	0				0	284	250			
V/C Ratio(X)	0.78	0.80	0.00				0.00	0.71	0.75			
Avail Cap(c_a), veh/h	1047	1913	0				0	390	344			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	0.37	0.37	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	26.1	25.4	0.0				0.0	30.4	30.6			
Incr Delay (d2), s/veh	2.2	1.3	0.0				0.0	7.2	9.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	17.9	16.4	0.0				0.0	4.7	4.6			
LnGrp Delay(d),s/veh	28.3	26.7	0.0				0.0	37.6	40.5			
LnGrp LOS	C	C						D	D			
Approach Vol, veh/h		2346						389				
Approach Delay, s/veh		27.3						39.0				
Approach LOS		C						D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6						
Phs Duration (G+Y+Rc), s				19.3		60.7						
Change Period (Y+Rc), s				* 4.2		4.6						
Max Green Setting (Gmax), s				* 21		50.4						
Max Q Clear Time (g_c+I1), s				12.6		46.0						
Green Ext Time (p_c), s				2.0		4.2						
Intersection Summary												
HCM 2010 Ctrl Delay			28.9									
HCM 2010 LOS			C									
Notes												




















HCM 2010 Signalized Intersection Summary
23: B & 2nd

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑		↑	↑	
Traffic Volume (veh/h)	0	2087	90	0	0	0	0	0	250	210	290	0
Future Volume (veh/h)	0	2087	90	0	0	0	0	0	250	210	290	0
Number	1	6	16				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.90	0.97		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1500	1382				0	1588	1591	1560	1500	0
Adj Flow Rate, veh/h	0	2174	88				0	0	243	219	302	0
Adj No. of Lanes	0	3	0				0	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	0	0	0				0	0	359	205	441	0
Arrive On Green	0.00	0.00	0.00				0.00	0.00	0.29	0.10	0.10	0.00
Sat Flow, veh/h		0					0	0	1221	974	1500	0
Grp Volume(v), veh/h		0.0					0	0	243	219	302	0
Grp Sat Flow(s),veh/h/ln							0	0	1221	974	1500	0
Q Serve(g_s), s							0.0	0.0	14.0	9.5	15.6	0.0
Cycle Q Clear(g_c), s							0.0	0.0	14.0	23.5	15.6	0.0
Prop In Lane							0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h							0	0	359	205	441	0
V/C Ratio(X)							0.00	0.00	0.68	1.07	0.69	0.00
Avail Cap(c_a), veh/h							0	0	359	205	441	0
HCM Platoon Ratio							1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(l)							0.00	0.00	1.00	0.68	0.68	0.00
Uniform Delay (d), s/veh							0.0	0.0	24.9	45.2	32.5	0.0
Incr Delay (d2), s/veh							0.0	0.0	4.2	70.9	2.5	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.0	0.0	5.1	8.6	6.8	0.0
LnGrp Delay(d),s/veh							0.0	0.0	29.1	116.1	35.1	0.0
LnGrp LOS									C	F	D	
Approach Vol, veh/h								243			521	
Approach Delay, s/veh								29.1			69.1	
Approach LOS								C			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4				8				
Phs Duration (G+Y+Rc), s				28.0				28.0				
Change Period (Y+Rc), s				4.5				4.5				
Max Green Setting (Gmax), s				23.5				23.5				
Max Q Clear Time (g_c+I1), s				25.5				16.0				
Green Ext Time (p_c), s				0.0				0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				56.4								
HCM 2010 LOS				E								

HCM 2010 Signalized Intersection Summary
24: A & 2nd

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  						 				
Traffic Volume (veh/h)	110	2252	185	0	0	0	0	335	30	120	140	0
Future Volume (veh/h)	110	2252	185	0	0	0	0	335	30	120	140	0
Number	5	2	12				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96				1.00		0.90	0.96		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1765	1800				0	1676	1710	1676	1744	0
Adj Flow Rate, veh/h	115	2346	182				0	349	23	125	146	0
Adj No. of Lanes	0	3	0				0	2	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	134	2882	227				0	516	34	161	431	0
Arrive On Green	0.21	0.21	0.21				0.00	0.17	0.17	0.01	0.08	0.00
Sat Flow, veh/h	208	4484	352				0	3096	197	1597	1744	0
Grp Volume(v), veh/h	969	804	870				0	183	189	125	146	0
Grp Sat Flow(s),veh/h/ln	1754	1606	1684				0	1593	1616	1597	1744	0
Q Serve(g_s), s	42.6	37.8	39.2				0.0	8.6	8.8	0.0	6.3	0.0
Cycle Q Clear(g_c), s	42.6	37.8	39.2				0.0	8.6	8.8	0.0	6.3	0.0
Prop In Lane	0.12		0.21				0.00		0.12	1.00		0.00
Lane Grp Cap(c), veh/h	1127	1032	1082				0	273	277	161	431	0
V/C Ratio(X)	0.86	0.78	0.80				0.00	0.67	0.68	0.77	0.34	0.00
Avail Cap(c_a), veh/h	1127	1032	1082				0	321	325	164	482	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	0.16	0.16	0.16				0.00	1.00	1.00	0.63	0.63	0.00
Uniform Delay (d), s/veh	28.0	26.2	26.7				0.0	31.0	31.1	38.4	30.6	0.0
Incr Delay (d2), s/veh	1.5	1.0	1.0				0.0	7.0	7.3	15.6	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.1	17.1	18.6				0.0	4.3	4.4	3.5	3.1	0.0
LnGrp Delay(d),s/veh	29.5	27.1	27.8				0.0	38.0	38.4	54.0	31.2	0.0
LnGrp LOS	C	C	C					D	D	D	C	
Approach Vol, veh/h		2643						372			271	
Approach Delay, s/veh		28.2						38.2			41.7	
Approach LOS		C						D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		56.0		24.0			6.1	17.9				
Change Period (Y+Rc), s		4.6		* 4.2			* 4.2	* 4.2				
Max Green Setting (Gmax), s		49.1		* 22			* 2	* 16				
Max Q Clear Time (g_c+I1), s		44.6		8.3			2.0	10.8				
Green Ext Time (p_c), s		4.4		0.8			0.0	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			30.5									
HCM 2010 LOS			C									
Notes												

Intersection 25

Brooks St/2nd St

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	115	101	88.2%	27.7	5.4	D
	Through						
	Right Turn						
	Subtotal	115	101	88.2%	27.7	5.4	D
EB	Left Turn	45	43	94.7%	3.3	0.6	A
	Through	2,392	2,383	99.6%	2.8	0.3	A
	Right Turn						
	Subtotal	2,437	2,426	99.6%	2.8	0.3	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,552	2,527	99.0%	3.8	0.5	A

Intersection 26


















Lindaro St/2nd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	91	80	88.2%	18.9	5.2	B
	Right Turn	433	402	92.9%	34.5	9.3	C
	Subtotal	524	482	92.0%	32.1	7.6	C
SB	Left Turn	117	114	97.5%	34.5	15.4	C
	Through	180	200	111.1%	23.2	4.5	C
	Right Turn						
	Subtotal	297	314	105.8%	27.0	7.6	C
EB	Left Turn	61	66	107.6%	18.4	3.4	B
	Through	2,372	2,327	98.1%	18.0	2.7	B
	Right Turn	44	38	87.3%	12.0	4.3	B
	Subtotal	2,477	2,431	98.2%	17.9	2.7	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,298	3,228	97.9%	21.0	2.6	C



















HCM 2010 Signalized Intersection Summary
27: Lincoln & 2nd

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	236	2564	62	0	0	0	0	211	140	150	190	0
Future Volume (veh/h)	236	2564	62	0	0	0	0	211	140	150	190	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1412	1412				0	1412	1412	1382	1355	0
Adj Flow Rate, veh/h	246	2671	44				0	220	134	156	198	0
Adj No. of Lanes	0	4	1				0	1	1	0	2	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	222	2598	657				0	473	389	246	408	0
Arrive On Green	0.18	0.18	0.18				0.00	0.34	0.34	0.67	0.67	0.00
Sat Flow, veh/h	396	4638	1172				0	1412	1161	475	1281	0
Grp Volume(v), veh/h	865	2052	44				0	220	134	169	185	0
Grp Sat Flow(s),veh/h/ln	1392	1214	1172				0	1412	1161	523	1172	0
Q Serve(g_s), s	44.8	44.8	2.5				0.0	9.8	6.9	15.9	6.1	0.0
Cycle Q Clear(g_c), s	44.8	44.8	2.5				0.0	9.8	6.9	25.8	6.1	0.0
Prop In Lane	0.28		1.00				0.00		1.00	0.92		0.00
Lane Grp Cap(c), veh/h	780	2040	657				0	473	389	262	393	0
V/C Ratio(X)	1.11	1.01	0.07				0.00	0.47	0.34	0.65	0.47	0.00
Avail Cap(c_a), veh/h	780	2040	657				0	473	389	262	393	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	0.09	0.09	0.09				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.6	32.6	15.4				0.0	21.0	20.0	17.5	9.8	0.0
Incr Delay (d2), s/veh	51.4	7.5	0.0				0.0	0.7	0.5	5.4	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	28.4	16.5	0.8				0.0	3.9	2.3	4.0	1.9	0.0
LnGrp Delay(d),s/veh	84.0	40.1	15.4				0.0	21.7	20.5	22.9	10.7	0.0
LnGrp LOS	F	F	B					C	C	C	B	
Approach Vol, veh/h		2961						354			354	
Approach Delay, s/veh		52.6						21.2			16.5	
Approach LOS		D						C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		49.0		31.0				31.0				
Change Period (Y+Rc), s		* 4.2		* 4.2				* 4.2				
Max Green Setting (Gmax), s		* 45		* 27				* 27				
Max Q Clear Time (g_c+I1), s		46.8		11.8				27.8				
Green Ext Time (p_c), s		0.0		1.3				0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			46.1									
HCM 2010 LOS			D									
Notes												

















HCM 2010 Signalized Intersection Summary
 28: Francisco W./Tamalpais & 2nd

Cumulative Plus Project Buildout
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	2694	120	0	0	0	0	150	370	85	255	0
Future Volume (veh/h)	40	2694	120	0	0	0	0	150	370	85	255	0
Number	5	2	12				7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93				1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1412	1412				0	1412	1468	1412	1412	0
Adj Flow Rate, veh/h	42	2806	80				0	156	351	89	266	0
Adj No. of Lanes	0	4	1				0	1	1	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	37	2621	587				0	439	379	250	439	0
Arrive On Green	0.17	0.17	0.17				0.00	0.31	0.31	0.62	0.62	0.00
Sat Flow, veh/h	70	4981	1116				0	1412	1217	710	1412	0
Grp Volume(v), veh/h	850	1998	80				0	156	351	89	266	0
Grp Sat Flow(s),veh/h/ln	1408	1214	1116				0	1412	1217	710	1412	0
Q Serve(g_s), s	42.1	42.1	4.9				0.0	6.8	22.3	7.3	9.1	0.0
Cycle Q Clear(g_c), s	42.1	42.1	4.9				0.0	6.8	22.3	14.2	9.1	0.0
Prop In Lane	0.05		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	741	1917	587				0	439	379	250	439	0
V/C Ratio(X)	1.15	1.04	0.14				0.00	0.35	0.93	0.36	0.61	0.00
Avail Cap(c_a), veh/h	741	1917	587				0	468	403	265	468	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	0.09	0.09	0.09				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.1	33.1	17.7				0.0	21.3	26.7	15.6	12.1	0.0
Incr Delay (d2), s/veh	67.6	21.1	0.0				0.0	0.5	26.6	0.9	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	30.3	17.9	1.5				0.0	2.7	10.3	1.5	3.6	0.0
LnGrp Delay(d),s/veh	100.7	54.1	17.7				0.0	21.8	53.2	16.4	14.1	0.0
LnGrp LOS	F	F	B					C	D	B	B	
Approach Vol, veh/h		2928						507			355	
Approach Delay, s/veh		66.6						43.6			14.7	
Approach LOS		E						D			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s		48.6		31.4				31.4				
Change Period (Y+Rc), s		6.5		6.5				6.5				
Max Green Setting (Gmax), s		40.5		26.5				26.5				
Max Q Clear Time (g_c+I1), s		44.1		24.3				16.2				
Green Ext Time (p_c), s		0.0		0.6				1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			58.7									
HCM 2010 LOS			E									






















HCM 2010 Signalized Intersection Summary
 29: 101 SBO on Hetherton/Hetherton & 2nd/2nd St

Cumulative Plus Project Buildout
 Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1976	1168	0	0	0	0	0	0	390	845	0
Future Volume (veh/h)	0	1976	1168	0	0	0	0	0	0	390	845	0
Number	5	2	12							7	4	14
Initial Q (Qb), veh	0	0	0							0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00							1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00							1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1500	1500							1500	1500	0
Adj Flow Rate, veh/h	0	2058	1186							406	880	0
Adj No. of Lanes	0	3	2							1	2	0
Peak Hour Factor	0.96	0.96	0.96							0.96	0.96	0.96
Percent Heavy Veh, %	0	2	2							2	2	0
Cap, veh/h	0	2303	1305							465	977	0
Arrive On Green	0.00	0.17	0.17							0.11	0.11	0.00
Sat Flow, veh/h	0	4500	2550							1429	3000	0
Grp Volume(v), veh/h	0	2058	1186							406	880	0
Grp Sat Flow(s),veh/h/ln	0	1500	1275							1429	1500	0
Q Serve(g_s), s	0.0	35.8	36.5							22.4	23.2	0.0
Cycle Q Clear(g_c), s	0.0	35.8	36.5							22.4	23.2	0.0
Prop In Lane	0.00		1.00							1.00		0.00
Lane Grp Cap(c), veh/h	0	2303	1305							465	977	0
V/C Ratio(X)	0.00	0.89	0.91							0.87	0.90	0.00
Avail Cap(c_a), veh/h	0	2303	1305							473	994	0
HCM Platoon Ratio	1.00	0.33	0.33							0.33	0.33	1.00
Upstream Filter(I)	0.00	0.09	0.09							0.87	0.87	0.00
Uniform Delay (d), s/veh	0.0	31.1	31.4							34.1	34.4	0.0
Incr Delay (d2), s/veh	0.0	0.6	1.2							14.4	9.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0							0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	15.0	13.1							10.7	11.0	0.0
LnGrp Delay(d),s/veh	0.0	31.7	32.6							48.5	44.2	0.0
LnGrp LOS		C	C							D	D	
Approach Vol, veh/h		3244									1286	
Approach Delay, s/veh		32.0									45.6	
Approach LOS		C									D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		49.4		30.6								
Change Period (Y+Rc), s		8.5		4.5								
Max Green Setting (Gmax), s		40.5		26.5								
Max Q Clear Time (g_c+I1), s		38.5		25.2								
Green Ext Time (p_c), s		1.9		0.9								
Intersection Summary												
HCM 2010 Ctrl Delay			35.9									
HCM 2010 LOS			D									
Notes												





















HCM 2010 Signalized Intersection Summary
30: Irwin & 2nd St

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		   						  				
Traffic Volume (veh/h)	1020	1396	0	0	0	0	0	1498	600	0	0	0
Future Volume (veh/h)	1020	1396	0	0	0	0	0	1498	600	0	0	0
Number	5	2	12				7	4	14			
Initial Q (Qb), veh	0	0	0				0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.94			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1468	1500	0				0	1412	1412			
Adj Flow Rate, veh/h	1099	1402	0				0	1560	616			
Adj No. of Lanes	2	2	0				0	3	1			
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0				0	2	2			
Cap, veh/h	1501	1418	0				0	1580	464			
Arrive On Green	0.16	0.16	0.00				0.00	0.41	0.41			
Sat Flow, veh/h	2797	3000	0				0	3981	1132			
Grp Volume(v), veh/h	1099	1402	0				0	1560	616			
Grp Sat Flow(s),veh/h/ln	1398	1500	0				0	1285	1132			
Q Serve(g_s), s	30.5	37.3	0.0				0.0	32.1	32.8			
Cycle Q Clear(g_c), s	30.5	37.3	0.0				0.0	32.1	32.8			
Prop In Lane	1.00		0.00				0.00		1.00			
Lane Grp Cap(c), veh/h	1501	1418	0				0	1580	464			
V/C Ratio(X)	0.73	0.99	0.00				0.00	0.99	1.33			
Avail Cap(c_a), veh/h	1501	1418	0				0	1580	464			
HCM Platoon Ratio	0.33	0.33	1.00				1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00				0.00	1.00	1.00			
Uniform Delay (d), s/veh	30.7	33.6	0.0				0.0	23.4	23.6			
Incr Delay (d2), s/veh	0.3	5.1	0.0				0.0	19.7	161.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	11.9	16.5	0.0				0.0	14.1	31.0			
LnGrp Delay(d),s/veh	31.0	38.6	0.0				0.0	43.0	185.4			
LnGrp LOS	C	D						D	F			
Approach Vol, veh/h		2501						2176				
Approach Delay, s/veh		35.3						83.3				
Approach LOS		D						F				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		42.0		38.0								
Change Period (Y+Rc), s		* 4.2		* 5.2								
Max Green Setting (Gmax), s		* 38		* 33								
Max Q Clear Time (g_c+I1), s		39.3		34.8								
Green Ext Time (p_c), s		0.0		0.0								
Intersection Summary												
HCM 2010 Ctrl Delay			57.6									
HCM 2010 LOS			E									
Notes												

HCM 2010 Signalized Intersection Summary
31: Lindaro & Andersen

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	300	40	80	300	52	70	237	180	103	140	30
Future Volume (veh/h)	20	300	40	80	300	52	70	237	180	103	140	30
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.96	1.00		0.93
Parking Bus, Adj	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 Sat Flow, veh/h/ln	2039	2039	2000	1961	1961	2000	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	21	312	36	83	312	47	73	247	155	107	146	22
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	57	401	46	160	464	70	255	311	195	215	427	64
Arrive On Green	0.03	0.22	0.22	0.09	0.28	0.28	0.14	0.30	0.30	0.12	0.27	0.27
Sat Flow, veh/h	1942	1786	206	1867	1656	249	1774	1052	660	1774	1564	236
Grp Volume(v), veh/h	21	0	348	83	0	359	73	0	402	107	0	168
Grp Sat Flow(s),veh/h/ln	1942	0	1992	1867	0	1905	1774	0	1712	1774	0	1800
Q Serve(g_s), s	0.7	0.0	10.3	2.7	0.0	10.5	2.3	0.0	13.5	3.5	0.0	4.7
Cycle Q Clear(g_c), s	0.7	0.0	10.3	2.7	0.0	10.5	2.3	0.0	13.5	3.5	0.0	4.7
Prop In Lane	1.00		0.10	1.00		0.13	1.00		0.39	1.00		0.13
Lane Grp Cap(c), veh/h	57	0	447	160	0	534	255	0	506	215	0	492
V/C Ratio(X)	0.37	0.00	0.78	0.52	0.00	0.67	0.29	0.00	0.79	0.50	0.00	0.34
Avail Cap(c_a), veh/h	248	0	735	298	0	764	283	0	678	283	0	713
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.8	0.0	22.8	27.4	0.0	20.0	23.9	0.0	20.3	25.7	0.0	18.2
Incr Delay (d2), s/veh	1.5	0.0	3.0	1.0	0.0	1.5	0.2	0.0	4.7	0.7	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	6.0	1.4	0.0	5.7	1.1	0.0	7.0	1.8	0.0	2.4
LnGrp Delay(d),s/veh	31.3	0.0	25.8	28.4	0.0	21.4	24.2	0.0	25.0	26.4	0.0	18.6
LnGrp LOS	C		C	C		C	C		C	C		B
Approach Vol, veh/h		369			442			475			275	
Approach Delay, s/veh		26.1			22.7			24.9			21.6	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.3	18.9	13.0	21.3	5.8	22.4	11.6	22.7				
Change Period (Y+Rc), s	4.0	4.9	4.0	* 4.2	4.0	4.9	4.0	* 4.2				
Max Green Setting (Gmax), s	10.0	23.1	10.0	* 25	8.0	25.1	10.0	* 25				
Max Q Clear Time (g_c+I1), s	4.7	12.3	4.3	6.7	2.7	12.5	5.5	15.5				
Green Ext Time (p_c), s	0.1	1.1	0.0	0.6	0.0	1.2	0.1	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			24.0									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis
 32: Tamalpais & Mission

Cumulative Plus Project Buildout
 Timing Plan: PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		
Traffic Volume (vph)	520	60	0	685	0	0
Future Volume (vph)	520	60	0	685	0	0
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0			3.0		
Lane Util. Factor	1.00			1.00		
Frbp, ped/bikes	0.99			1.00		
Flpb, ped/bikes	1.00			1.00		
Frt	0.99			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	1557			1588		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	1557			1588		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	542	62	0	714	0	0
RTOR Reduction (vph)	5	0	0	0	0	0
Lane Group Flow (vph)	600	0	0	714	0	0
Confl. Peds. (#/hr)	10		10		10	
Turn Type	NA			NA		
Protected Phases	2			3 4 6		
Permitted Phases						
Actuated Green, G (s)	36.4			56.5		
Effective Green, g (s)	36.4			50.5		
Actuated g/C Ratio	0.45			0.63		
Clearance Time (s)	6.0					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	708			1002		
v/s Ratio Prot	c0.38			c0.45		
v/s Ratio Perm						
v/c Ratio	0.85			0.71		
Uniform Delay, d1	19.3			9.9		
Progression Factor	0.62			0.37		
Incremental Delay, d2	10.2			0.6		
Delay (s)	22.2			4.3		
Level of Service	C			A		
Approach Delay (s)	22.2			4.3		0.0
Approach LOS	C			A		A

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	94.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
33: Tamalpais & 5th

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↔			↑						↕			
Traffic Volume (vph)	0	500	60	0	330	0	0	0	0	30	20	20		
Future Volume (vph)	0	500	60	0	330	0	0	0	0	30	20	20		
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800		
Total Lost time (s)		6.0			6.0						6.0			
Lane Util. Factor		1.00			1.00						1.00			
Frbp, ped/bikes		0.99			1.00						0.99			
Flpb, ped/bikes		1.00			1.00						1.00			
Frt		0.99			1.00						0.96			
Flt Protected		1.00			1.00						0.98			
Satd. Flow (prot)		1557			1588						1476			
Flt Permitted		1.00			1.00						0.98			
Satd. Flow (perm)		1557			1588						1476			
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96		
Adj. Flow (vph)	0	521	62	0	344	0	0	0	0	31	21	21		
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	0	19	0		
Lane Group Flow (vph)	0	580	0	0	344	0	0	0	0	0	54	0		
Confl. Peds. (#/hr)	10		10	10		10	10					10		
Turn Type		NA			NA					Perm	NA			
Protected Phases		2			4	6					8			
Permitted Phases										8				
Actuated Green, G (s)		42.7			58.9						9.1			
Effective Green, g (s)		42.7			58.9						9.1			
Actuated g/C Ratio		0.53			0.74						0.11			
Clearance Time (s)		6.0									6.0			
Vehicle Extension (s)		3.0									1.5			
Lane Grp Cap (vph)		831			1169						167			
v/s Ratio Prot		c0.37			c0.22									
v/s Ratio Perm											0.04			
v/c Ratio		0.70			0.29						0.33			
Uniform Delay, d1		13.9			3.6						32.6			
Progression Factor		0.66			0.06						0.64			
Incremental Delay, d2		3.6			0.0						0.3			
Delay (s)		12.7			0.3						21.3			
Level of Service		B			A						C			
Approach Delay (s)		12.7			0.3			0.0			21.3			
Approach LOS		B			A			A			C			
Intersection Summary														
HCM 2000 Control Delay			9.1									HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio			0.59											
Actuated Cycle Length (s)			80.0								18.0		Sum of lost time (s)	
Intersection Capacity Utilization			85.5%										ICU Level of Service	E
Analysis Period (min)			15											
c Critical Lane Group														

HCM Signalized Intersection Capacity Analysis
 34: Tamalpais & Mission

Cumulative Plus Project Buildout
 Timing Plan: PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Traffic Volume (vph)	520	0	0	675	10	20
Future Volume (vph)	520	0	0	675	10	20
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.0			6.0	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.91	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	1588			1588	1420	
Flt Permitted	1.00			1.00	0.98	
Satd. Flow (perm)	1588			1588	1420	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	542	0	0	703	10	21
RTOR Reduction (vph)	0	0	0	0	17	0
Lane Group Flow (vph)	542	0	0	703	14	0
Confl. Peds. (#/hr)		10				
Turn Type	NA			NA	Prot	
Protected Phases	2 8			6	3 4	
Permitted Phases						
Actuated Green, G (s)	54.3			36.4	14.1	
Effective Green, g (s)	48.7			36.4	14.1	
Actuated g/C Ratio	0.61			0.45	0.18	
Clearance Time (s)				6.0		
Vehicle Extension (s)				3.0		
Lane Grp Cap (vph)	966			722	250	
v/s Ratio Prot	c0.34			c0.44	c0.01	
v/s Ratio Perm						
v/c Ratio	0.56			0.97	0.05	
Uniform Delay, d1	9.3			21.3	27.4	
Progression Factor	0.22			1.04	1.94	
Incremental Delay, d2	0.4			22.3	0.0	
Delay (s)	2.4			44.5	53.1	
Level of Service	A			D	D	
Approach Delay (s)	2.4			44.5	53.1	
Approach LOS	A			D	D	

Intersection Summary			
HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	94.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

35: Tamalpais & 5th

Cumulative Plus Project Buildout
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑			↑				
Traffic Volume (vph)	0	530	0	0	310	10	20	20	20	0	0	0
Future Volume (vph)	0	530	0	0	310	10	20	20	20	0	0	0
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		1.00			1.00			1.00				
Frbp, ped/bikes		1.00			1.00			0.99				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			1.00			0.95				
Flt Protected		1.00			1.00			0.98				
Satd. Flow (prot)		1588			1580			1470				
Flt Permitted		1.00			1.00			0.98				
Satd. Flow (perm)		1588			1580			1470				
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	552	0	0	323	10	21	21	21	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	18	0	0	0	0
Lane Group Flow (vph)	0	552	0	0	332	0	0	45	0	0	0	0
Confl. Peds. (#/hr)	10		10			10			10			
Turn Type		NA			NA		Split	NA				
Protected Phases		2 8			6		4	4				
Permitted Phases												
Actuated Green, G (s)		57.8			42.7			10.2				
Effective Green, g (s)		57.8			42.7			10.2				
Actuated g/C Ratio		0.72			0.53			0.13				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			1.5				
Lane Grp Cap (vph)		1147			843			187				
v/s Ratio Prot		c0.35			0.21			c0.03				
v/s Ratio Perm												
v/c Ratio		0.48			0.39			0.24				
Uniform Delay, d1		4.7			11.0			31.4				
Progression Factor		0.15			0.61			1.16				
Incremental Delay, d2		0.1			1.3			0.2				
Delay (s)		0.8			7.9			36.7				
Level of Service		A			A			D				
Approach Delay (s)		0.8			7.9			36.7			0.0	
Approach LOS		A			A			D			A	
Intersection Summary												
HCM 2000 Control Delay			5.7				HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			80.0				Sum of lost time (s)		18.0			
Intersection Capacity Utilization			85.5%				ICU Level of Service		E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

Cumulative Plus Project Buildout

36: Tamalpais & 4th

Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑			↑				
Traffic Volume (vph)	0	465	0	0	420	40	20	15	20	0	0	0
Future Volume (vph)	0	465	0	0	420	40	20	15	20	0	0	0
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0			6.0			6.0				
Lane Util. Factor		1.00			1.00			1.00				
Frbp, ped/bikes		1.00			0.98			0.99				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		1.00			0.99			0.95				
Flt Protected		1.00			1.00			0.98				
Satd. Flow (prot)		1588			1546			1469				
Flt Permitted		1.00			1.00			0.98				
Satd. Flow (perm)		1588			1546			1469				
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	484	0	0	438	42	21	16	21	0	0	0
RTOR Reduction (vph)	0	0	0	0	4	0	0	17	0	0	0	0
Lane Group Flow (vph)	0	484	0	0	476	0	0	41	0	0	0	0
Confl. Peds. (#/hr)	59		21			59			10			
Turn Type		NA			NA		Split	NA				
Protected Phases		2 8			6		4	4				
Permitted Phases												
Actuated Green, G (s)		54.9			35.6			13.5				
Effective Green, g (s)		54.9			35.6			13.5				
Actuated g/C Ratio		0.69			0.45			0.17				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)		1089			687			247				
v/s Ratio Prot		c0.30			c0.31			c0.03				
v/s Ratio Perm												
v/c Ratio		0.44			0.69			0.16				
Uniform Delay, d1		5.7			17.8			28.4				
Progression Factor		0.18			0.63			1.01				
Incremental Delay, d2		0.3			5.1			0.2				
Delay (s)		1.3			16.3			29.0				
Level of Service		A			B			C				
Approach Delay (s)		1.3			16.3			29.0			0.0	
Approach LOS		A			B			C			A	
Intersection Summary												
HCM 2000 Control Delay			9.9				HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			80.0				Sum of lost time (s)		17.6			
Intersection Capacity Utilization			95.9%				ICU Level of Service		F			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection 15 Brooks St/3rd St Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	21	23	110.4%	8.7	2.0	A
	Through	5	4	81.0%	16.5	15.9	C
	Right Turn						
	Subtotal	26	27	104.7%	11.0	3.0	B
SB	Left Turn						
	Through	5	4	73.6%	15.7	18.4	C
	Right Turn	10	13	125.1%	11.5	9.2	B
	Subtotal	15	16	107.9%	19.3	11.3	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	51	38	73.6%	2.5	0.3	A
	Through	1,401	1,353	96.6%	2.0	0.4	A
	Right Turn	10	6	62.6%	2.0	1.5	A
	Subtotal	1,462	1,397	95.5%	2.0	0.4	A
Total		1,503	1,440	95.8%	2.4	0.4	A

Intersection 16 Lindaro St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	86	90	104.4%	21.8	4.9	C
	Through	10	11	106.7%	27.5	15.0	C
	Right Turn						
	Subtotal	96	100	104.7%	22.5	4.0	C
SB	Left Turn						
	Through	40	36	90.2%	48.0	12.8	D
	Right Turn	10	8	81.0%	9.0	7.6	A
	Subtotal	50	44	88.3%	41.0	9.3	D
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	477	446	93.6%	27.8	11.4	C
	Through	1,396	1,321	94.7%	8.3	3.3	A
	Right Turn	30	29	96.9%	8.0	3.0	A
	Subtotal	1,903	1,797	94.4%	13.2	5.4	B
Total		2,049	1,942	94.8%	14.3	5.1	B

Intersection 25

Brooks St/2nd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	50	42	84.6%	31.5	8.9	C
	Through						
	Right Turn						
	Subtotal	50	42	84.6%	31.5	8.9	C
EB	Left Turn	25	28	111.9%	6.1	2.6	A
	Through	2,307	2,238	97.0%	6.0	1.1	A
	Right Turn						
	Subtotal	2,332	2,266	97.2%	6.0	1.1	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,382	2,308	96.9%	6.4	1.2	A

Intersection 26

Lindaro St/2nd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn						
	Through	54	58	107.7%	15.7	4.1	B
	Right Turn	281	278	99.0%	23.7	4.9	C
	Subtotal	335	336	100.4%	22.5	4.5	C
SB	Left Turn	72	72	100.7%	38.7	2.0	D
	Through	442	404	91.3%	36.6	3.5	D
	Right Turn						
	Subtotal	514	476	92.6%	37.0	2.9	D
EB	Left Turn	42	44	104.3%	13.5	4.3	B
	Through	2,289	2,197	96.0%	12.1	1.3	B
	Right Turn	61	67	109.2%	9.3	1.7	A
	Subtotal	2,392	2,308	96.5%	12.1	1.3	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,241	3,120	96.3%	17.0	1.3	B

Intersection 15 Brooks St/3rd St Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	42	40	94.2%	18.9	8.0	C
	Through	5	5	99.8%	34.0	27.1	D
	Right Turn						
	Subtotal	47	45	94.8%	20.1	7.8	C
SB	Left Turn						
	Through	15	17	115.2%	28.4	11.8	D
	Right Turn	10	10	103.7%	14.1	8.9	B
	Subtotal	25	28	110.6%	21.9	5.8	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	88	78	89.0%	2.9	0.4	A
	Through	1,829	1,811	99.0%	2.3	0.4	A
	Right Turn	10	12	115.2%	2.2	1.0	A
	Subtotal	1,927	1,900	98.6%	2.3	0.3	A
Total		1,999	1,973	98.7%	3.1	0.3	A

Intersection 16 Lindaro St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	132	118	89.0%	29.9	2.0	C
	Through	20	25	124.8%	33.2	7.8	C
	Right Turn						
	Subtotal	152	142	93.7%	30.4	2.5	C
SB	Left Turn						
	Through	50	53	106.0%	23.9	8.2	C
	Right Turn	10	12	122.9%	16.5	10.5	B
	Subtotal	60	65	108.8%	23.0	7.6	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	242	239	98.9%	9.1	1.6	A
	Through	1,872	1,834	98.0%	6.1	0.7	A
	Right Turn	40	46	114.2%	6.1	2.5	A
	Subtotal	2,154	2,119	98.4%	6.4	0.7	A
Total		2,366	2,327	98.3%	8.4	0.7	A

Intersection 25

Brooks St/2nd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	115	101	87.8%	31.5	5.3	C
	Through						
	Right Turn						
	Subtotal	115	101	87.8%	31.5	5.3	C
EB	Left Turn	45	43	96.4%	6.1	3.0	A
	Through	2,392	2,408	100.7%	7.2	0.7	A
	Right Turn						
	Subtotal	2,437	2,452	100.6%	7.2	0.7	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,552	2,553	100.0%	8.1	0.8	A

Intersection 26


















Lindaro St/2nd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn						
	Through	91	80	87.8%	20.1	3.6	C
	Right Turn	433	423	97.6%	37.6	10.5	D
	Subtotal	524	503	95.9%	34.9	9.3	C
SB	Left Turn	117	108	92.6%	25.5	4.3	C
	Through	180	181	100.7%	17.6	3.4	B
	Right Turn						
	Subtotal	297	290	97.5%	20.5	3.1	C
EB	Left Turn	61	61	100.7%	17.7	3.4	B
	Through	2,372	2,347	98.9%	14.9	1.7	B
	Right Turn	44	40	91.6%	11.0	2.9	B
	Subtotal	2,477	2,449	98.9%	14.9	1.7	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,298	3,241	98.3%	18.5	2.3	B

HCM 2010 Signalized Intersection Summary
14: A & 3rd

C+P with One-Way NB Brooks Street
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	71	1312	84	210	135	0	0	140	30
Future Volume (veh/h)	0	0	0	71	1312	84	210	135	0	0	140	30
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.93	0.96		1.00	1.00		0.92
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1800	1748	1800	1835	1835	0	0	1835	1890
Adj Flow Rate, veh/h				77	1426	82	228	147	0	0	152	21
Adj No. of Lanes				0	3	0	1	1	0	0	1	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	3	0	3	3	0	0	3	3
Cap, veh/h				127	2497	148	306	610	0	0	302	42
Arrive On Green				0.55	0.55	0.55	0.02	0.11	0.00	0.00	0.22	0.22
Sat Flow, veh/h				229	4507	268	1748	1835	0	0	1389	192
Grp Volume(v), veh/h				584	487	514	228	147	0	0	0	173
Grp Sat Flow(s),veh/h/ln				1736	1590	1677	1748	1835	0	0	0	1581
Q Serve(g_s), s				17.0	14.8	14.8	0.6	5.5	0.0	0.0	0.0	7.2
Cycle Q Clear(g_c), s				17.0	14.8	14.8	0.6	5.5	0.0	0.0	0.0	7.2
Prop In Lane				0.13		0.16	1.00		0.00	0.00		0.12
Lane Grp Cap(c), veh/h				962	881	929	306	610	0	0	0	344
V/C Ratio(X)				0.61	0.55	0.55	0.74	0.24	0.00	0.00	0.00	0.50
Avail Cap(c_a), veh/h				962	881	929	420	783	0	0	0	390
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	0.84	0.84	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				11.2	10.7	10.7	33.0	24.7	0.0	0.0	0.0	25.8
Incr Delay (d2), s/veh				2.8	2.5	2.4	6.9	0.4	0.0	0.0	0.0	2.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				8.7	7.0	7.3	5.3	2.9	0.0	0.0	0.0	3.4
LnGrp Delay(d),s/veh				14.1	13.2	13.1	39.9	25.1	0.0	0.0	0.0	28.2
LnGrp LOS				B	B	B	D	C				C
Approach Vol, veh/h					1585			375			173	
Approach Delay, s/veh					13.5			34.1			28.2	
Approach LOS					B			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			8.1	20.8		46.1		28.9				
Change Period (Y+Rc), s			4.0	4.5		4.5		4.0				
Max Green Setting (Gmax), s			9.0	18.5		34.5		32.0				
Max Q Clear Time (g_c+I1), s			2.6	9.2		19.0		7.5				
Green Ext Time (p_c), s			1.6	0.8		11.6		3.3				
Intersection Summary												
HCM 2010 Ctrl Delay				18.3								
HCM 2010 LOS				B								

Intersection 15 Brooks St/3rd St Side-street Stop

















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	36	33	92.0%	10.6	2.0	B
	Through	5	6	110.4%	20.2	19.0	C
	Right Turn						
	Subtotal	41	39	94.2%	13.4	3.5	B
SB	Left Turn						
	Through						
	Right Turn	15	13	85.9%	13.6	5.9	B
	Subtotal	15	13	85.9%	13.6	5.9	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through	1,416	1,362	96.2%	1.7	0.2	A
	Right Turn	10	10	103.0%	1.8	1.0	A
	Subtotal	1,426	1,373	96.3%	1.7	0.2	A
Total		1,482	1,424	96.1%	2.1	0.2	A

Intersection 16 Lindaro St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	85	82	96.1%	23.4	5.4	C
	Through	10	9	88.3%	17.0	13.9	B
	Right Turn						
	Subtotal	95	91	95.3%	23.1	5.0	C
SB	Left Turn						
	Through	40	43	107.6%	43.4	8.2	D
	Right Turn	10	11	106.7%	21.5	13.8	C
	Subtotal	50	54	107.5%	40.0	7.2	D
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	491	438	89.3%	23.8	10.0	C
	Through	1,382	1,326	95.9%	7.6	2.0	A
	Right Turn	30	29	98.1%	7.3	2.6	A
	Subtotal	1,903	1,793	94.2%	11.6	4.0	B
Total		2,048	1,938	94.6%	13.0	3.8	B

HCM 2010 Signalized Intersection Summary
24: A & 2nd

C+P with One-Way NB Brooks Street
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	2252	205	0	0	0	0	260	20	81	125	0
Future Volume (veh/h)	100	2252	205	0	0	0	0	260	20	81	125	0
Number	5	2	12				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97				1.00		0.95	0.98		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1748	1800				0	1660	1710	1660	1660	0
Adj Flow Rate, veh/h	109	2448	209				0	283	13	88	136	0
Adj No. of Lanes	0	3	0				0	2	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	0				0	3	3	3	3	0
Cap, veh/h	123	2912	251				0	448	20	163	373	0
Arrive On Green	0.22	0.22	0.22				0.00	0.15	0.15	0.01	0.07	0.00
Sat Flow, veh/h	187	4425	381				0	3147	140	1581	1660	0
Grp Volume(v), veh/h	1013	840	914				0	145	151	88	136	0
Grp Sat Flow(s),veh/h/ln	1738	1590	1665				0	1577	1627	1581	1660	0
Q Serve(g_s), s	42.4	37.5	39.3				0.0	6.5	6.6	0.0	5.8	0.0
Cycle Q Clear(g_c), s	42.4	37.5	39.3				0.0	6.5	6.6	0.0	5.8	0.0
Prop In Lane	0.11		0.23				0.00		0.09	1.00		0.00
Lane Grp Cap(c), veh/h	1144	1047	1096				0	231	238	163	373	0
V/C Ratio(X)	0.89	0.80	0.83				0.00	0.63	0.64	0.54	0.36	0.00
Avail Cap(c_a), veh/h	1144	1047	1096				0	336	347	170	487	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(l)	0.09	0.09	0.09				0.00	1.00	1.00	0.81	0.81	0.00
Uniform Delay (d), s/veh	26.6	24.7	25.4				0.0	30.1	30.1	36.0	29.6	0.0
Incr Delay (d2), s/veh	1.1	0.6	0.7				0.0	5.9	5.9	4.9	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.7	16.8	18.4				0.0	3.2	3.3	2.0	2.8	0.0
LnGrp Delay(d),s/veh	27.7	25.4	26.2				0.0	36.0	36.0	40.9	30.7	0.0
LnGrp LOS	C	C	C					D	D	D	C	
Approach Vol, veh/h		2766						296			224	
Approach Delay, s/veh		26.5						36.0			34.7	
Approach LOS		C						D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		54.0		21.0			5.9	15.2				
Change Period (Y+Rc), s		4.6		* 4.2			* 4.2	* 4.2				
Max Green Setting (Gmax), s		44.2		* 22			* 2	* 16				
Max Q Clear Time (g_c+I1), s		44.4		7.8			2.0	8.6				
Green Ext Time (p_c), s		0.0		1.4			0.0	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay				27.9								
HCM 2010 LOS				C								
Notes												
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.												

Intersection 25

Brooks St/2nd St

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn	25	24	95.7%	2.9	0.6	A
	Through	2,338	2,275	97.3%	2.7	0.2	A
	Right Turn						
	Subtotal	2,363	2,299	97.3%	2.7	0.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,363	2,299	97.3%	2.7	0.2	A

Intersection 26


















Lindaro St/2nd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	54	50	92.7%	15.9	5.6	B
	Right Turn	281	276	98.4%	19.0	6.6	B
	Subtotal	335	326	97.4%	18.7	6.3	B
SB	Left Turn	86	84	97.6%	38.2	5.3	D
	Through	443	391	88.3%	34.6	4.3	C
	Right Turn						
	Subtotal	529	475	89.8%	35.3	4.1	D
EB	Left Turn	42	41	98.1%	14.9	3.8	B
	Through	2,271	2,189	96.4%	14.3	2.4	B
	Right Turn	60	60	100.6%	12.6	4.6	B
	Subtotal	2,373	2,291	96.5%	14.3	2.4	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,237	3,092	95.5%	18.0	2.5	B

HCM 2010 Signalized Intersection Summary
14: A & 3rd

C+P with One-Way NB Brooks Street
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	189	1696	106	260	175	0	0	180	50
Future Volume (veh/h)	0	0	0	189	1696	106	260	175	0	0	180	50
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.91	0.96		1.00	1.00		0.91
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln				1800	1765	1800	1853	1853	0	0	1853	1890
Adj Flow Rate, veh/h				197	1767	103	271	182	0	0	188	38
Adj No. of Lanes				0	3	0	1	1	0	0	1	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				0	2	0	2	2	0	0	2	2
Cap, veh/h				243	2323	139	310	661	0	0	275	56
Arrive On Green				0.54	0.54	0.54	0.15	0.60	0.00	0.00	0.21	0.21
Sat Flow, veh/h				452	4327	259	1765	1853	0	0	1308	264
Grp Volume(v), veh/h				759	635	673	271	182	0	0	0	226
Grp Sat Flow(s),veh/h/ln				1742	1606	1690	1765	1853	0	0	0	1572
Q Serve(g_s), s				28.6	24.2	24.5	4.8	3.8	0.0	0.0	0.0	10.6
Cycle Q Clear(g_c), s				28.6	24.2	24.5	4.8	3.8	0.0	0.0	0.0	10.6
Prop In Lane				0.26		0.15	1.00		0.00	0.00		0.17
Lane Grp Cap(c), veh/h				935	862	907	310	661	0	0	0	330
V/C Ratio(X)				0.81	0.74	0.74	0.87	0.28	0.00	0.00	0.00	0.68
Avail Cap(c_a), veh/h				935	862	907	327	718	0	0	0	364
HCM Platoon Ratio				1.00	1.00	1.00	1.67	1.67	1.00	1.00	1.00	1.00
Upstream Filter(l)				1.00	1.00	1.00	0.73	0.73	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				15.2	14.2	14.3	31.1	11.2	0.0	0.0	0.0	29.2
Incr Delay (d2), s/veh				7.6	5.6	5.4	17.9	0.3	0.0	0.0	0.0	6.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				15.5	11.9	12.8	7.2	2.0	0.0	0.0	0.0	5.2
LnGrp Delay(d),s/veh				22.8	19.8	19.7	49.0	11.5	0.0	0.0	0.0	35.9
LnGrp LOS				C	B	B	D	B				D
Approach Vol, veh/h					2067			453			226	
Approach Delay, s/veh					20.8			34.0			35.9	
Approach LOS					C			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			11.2	21.3		47.5		32.5				
Change Period (Y+Rc), s			4.0	4.5		4.5		4.0				
Max Green Setting (Gmax), s			8.0	18.5		40.5		31.0				
Max Q Clear Time (g_c+I1), s			6.8	12.6		30.6		5.8				
Green Ext Time (p_c), s			0.4	0.8		9.0		4.2				
Intersection Summary												
HCM 2010 Ctrl Delay				24.2								
HCM 2010 LOS				C								

Intersection 15 Brooks St/3rd St Side-street Stop

















Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	77	76	99.2%	22.2	12.8	C
	Through	5	6	115.2%	20.2	17.1	C
	Right Turn						
	Subtotal	82	82	100.2%	22.6	12.8	C
SB	Left Turn						
	Through						
	Right Turn	25	24	95.2%	22.4	13.6	C
	Subtotal	25	24	95.2%	22.4	13.6	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through	1,861	1,823	97.9%	2.9	1.1	A
	Right Turn	10	10	103.7%	1.9	0.8	A
	Subtotal	1,871	1,833	98.0%	2.9	1.1	A
Total		1,978	1,939	98.0%	3.9	1.5	A

Intersection 16 Lindaro St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	132	119	90.2%	30.2	2.0	C
	Through	20	18	88.3%	29.2	9.3	C
	Right Turn						
	Subtotal	152	137	89.9%	30.2	2.4	C
SB	Left Turn						
	Through	50	53	106.0%	32.0	5.5	C
	Right Turn	10	9	92.2%	22.5	9.6	C
	Subtotal	60	62	103.7%	30.8	4.7	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	275	257	93.3%	9.8	2.7	A
	Through	1,839	1,793	97.5%	6.2	0.7	A
	Right Turn	40	42	105.6%	6.1	2.1	A
	Subtotal	2,154	2,092	97.1%	6.6	0.9	A
Total		2,366	2,291	96.8%	8.7	0.9	A

HCM 2010 Signalized Intersection Summary
24: A & 2nd

C+P with One-Way NB Brooks Street
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	2252	185	0	0	0	0	335	30	226	143	0
Future Volume (veh/h)	110	2252	185	0	0	0	0	335	30	226	143	0
Number	5	2	12				3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96				1.00		0.90	0.96		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1765	1800				0	1676	1710	1676	1744	0
Adj Flow Rate, veh/h	115	2346	182				0	349	23	235	149	0
Adj No. of Lanes	0	3	0				0	2	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	0				0	2	2	2	2	0
Cap, veh/h	123	2651	208				0	515	34	243	521	0
Arrive On Green	0.20	0.20	0.20				0.00	0.17	0.17	0.13	0.50	0.00
Sat Flow, veh/h	208	4483	352				0	3096	197	1597	1744	0
Grp Volume(v), veh/h	969	804	869				0	183	189	235	149	0
Grp Sat Flow(s),veh/h/ln	1754	1606	1683				0	1593	1616	1597	1744	0
Q Serve(g_s), s	43.5	38.6	40.1				0.0	8.6	8.8	5.4	4.0	0.0
Cycle Q Clear(g_c), s	43.5	38.6	40.1				0.0	8.6	8.8	5.4	4.0	0.0
Prop In Lane	0.12		0.21				0.00		0.12	1.00		0.00
Lane Grp Cap(c), veh/h	1037	950	995				0	273	277	243	521	0
V/C Ratio(X)	0.93	0.85	0.87				0.00	0.67	0.68	0.97	0.29	0.00
Avail Cap(c_a), veh/h	1037	950	995				0	319	323	243	567	0
HCM Platoon Ratio	0.33	0.33	0.33				1.00	1.00	1.00	1.67	1.67	1.00
Upstream Filter(I)	0.16	0.16	0.16				0.00	1.00	1.00	0.63	0.63	0.00
Uniform Delay (d), s/veh	30.7	28.7	29.3				0.0	31.1	31.1	33.1	15.1	0.0
Incr Delay (d2), s/veh	3.4	1.6	1.9				0.0	7.0	7.3	37.1	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	22.1	17.6	19.2				0.0	4.3	4.5	7.6	2.0	0.0
LnGrp Delay(d),s/veh	34.1	30.3	31.2				0.0	38.1	38.4	70.2	15.5	0.0
LnGrp LOS	C	C	C					D	D	E	B	
Approach Vol, veh/h		2643						372			384	
Approach Delay, s/veh		32.0						38.3			49.0	
Approach LOS		C						D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		51.9		28.1			10.2	17.9				
Change Period (Y+Rc), s		4.6		* 4.2			* 4.2	* 4.2				
Max Green Setting (Gmax), s		45.2		* 26			* 6	* 16				
Max Q Clear Time (g_c+I1), s		45.5		6.0			7.4	10.8				
Green Ext Time (p_c), s		0.0		3.2			0.0	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			34.6									
HCM 2010 LOS			C									
Notes												
User approved ignoring U-Turning movement.												

Intersection 25

Brooks St/2nd St

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn	45	47	105.0%	3.0	0.3	A
	Through	2,465	2,383	96.7%	2.7	0.2	A
	Right Turn						
	Subtotal	2,510	2,430	96.8%	2.7	0.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,510	2,430	96.8%	2.7	0.2	A

Intersection 26

Lindaro St/2nd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	91	84	92.4%	18.6	3.5	B
	Right Turn	433	414	95.6%	30.1	9.7	C
	Subtotal	524	498	95.0%	28.3	7.7	C
SB	Left Turn	149	138	92.5%	26.0	8.5	C
	Through	180	172	95.6%	18.9	4.3	B
	Right Turn						
	Subtotal	329	310	94.2%	22.2	5.9	C
EB	Left Turn	60	52	87.0%	17.0	4.6	B
	Through	2,334	2,242	96.0%	15.9	1.9	B
	Right Turn	41	46	111.5%	12.2	3.8	B
	Subtotal	2,435	2,340	96.1%	15.9	1.8	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,288	3,148	95.7%	18.5	1.9	B

Average Results from 10 RGNB Conditions (With PHB on east leg at 3rd/Brooks, w/WB LT Pocket at 3rd/Brooks)
 Volume and Delay by Movement AM Peak Hour

Intersection 15

Brooks St/3rd St

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	21	19	89.4%	9.9	4.7	A
	Through	5	6	110.4%	16.2	12.6	C
	Right Turn						
	Subtotal	26	24	93.4%	11.7	4.6	B
SB	Left Turn						
	Through	5	3	58.9%	10.1	13.0	B
	Right Turn	10	9	92.0%	8.4	6.2	A
	Subtotal	15	12	81.0%	10.9	7.1	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	51	52	101.0%	3.3	0.9	A
	Through	1,401	1,331	95.0%	3.4	0.8	A
	Right Turn	10	9	88.3%	3.1	0.8	A
	Subtotal	1,462	1,391	95.2%	3.4	0.9	A
Total		1,503	1,428	95.0%	3.7	0.8	A

Intersection 16

Lindaro St/3rd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	86	77	89.9%	23.3	7.1	C
	Through	10	10	103.0%	31.3	18.3	C
	Right Turn						
	Subtotal	96	88	91.2%	24.4	6.6	C
SB	Left Turn						
	Through	40	43	108.6%	46.4	12.0	D
	Right Turn	10	13	125.1%	27.5	10.1	C
	Subtotal	50	56	111.9%	41.7	11.1	D
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	477	436	91.5%	21.7	10.3	C
	Through	1,396	1,333	95.5%	7.1	1.7	A
	Right Turn	30	30	99.4%	6.2	2.2	A
	Subtotal	1,903	1,799	94.5%	10.7	3.9	B
Total		2,049	1,943	94.8%	12.3	3.4	B

Average Results from 10 RGNB Conditions (With PHB on east leg at 3rd/Brooks, w/WB LT Pocket at 3rd/Brooks)
 Volume and Delay by Movement AM Peak Hour

Intersection 25

Brooks St/2nd St

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	50	52	103.0%	27.1	4.1	D
	Through						
	Right Turn						
	Subtotal	50	52	103.0%	27.1	4.1	D
EB	Left Turn	25	22	89.8%	2.9	0.6	A
	Through	2,307	2,254	97.7%	2.6	0.2	A
	Right Turn						
	Subtotal	2,332	2,277	97.6%	2.6	0.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,382	2,328	97.7%	3.1	0.3	A

Intersection 26

Lindaro St/2nd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	54	55	102.2%	15.9	5.2	B
	Right Turn	281	277	98.5%	20.9	5.5	C
	Subtotal	335	332	99.1%	20.0	4.8	C
SB	Left Turn	72	65	90.5%	40.0	5.9	D
	Through	442	412	93.2%	35.6	3.6	D
	Right Turn						
	Subtotal	514	477	92.8%	36.2	3.5	D
EB	Left Turn	42	34	81.5%	15.3	5.6	B
	Through	2,289	2,228	97.3%	15.4	3.4	B
	Right Turn	61	72	118.2%	15.3	3.7	B
	Subtotal	2,392	2,335	97.6%	15.4	3.4	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,241	3,143	97.0%	19.1	2.6	B

Average Results from 10 RPS Conditions (With PHB on east leg at 3rd/Brooks, w/ WBLT Pocket at 3rd/Brooks)
 Volume and Delay by Movement PM Peak Hour

Intersection 15 Brooks St/3rd St Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	42	46	108.8%	16.9	6.8	C
	Through	5	5	99.8%	10.4	9.2	B
	Right Turn						
	Subtotal	47	51	107.8%	16.6	6.6	C
SB	Left Turn						
	Through	15	15	97.3%	29.8	16.3	D
	Right Turn	10	11	111.4%	16.1	9.0	C
	Subtotal	25	26	102.9%	24.9	11.4	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	88	83	93.8%	6.8	1.8	A
	Through	1,829	1,798	98.3%	7.1	2.0	A
	Right Turn	10	10	96.0%	7.0	2.9	A
	Subtotal	1,927	1,890	98.1%	7.1	1.9	A
Total		1,999	1,966	98.4%	7.6	2.0	A

Intersection 16 Lindaro St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	132	123	93.4%	31.1	2.9	C
	Through	20	19	94.1%	26.9	8.3	C
	Right Turn						
	Subtotal	152	142	93.5%	30.8	2.6	C
SB	Left Turn						
	Through	50	57	114.4%	27.6	4.5	C
	Right Turn	10	10	96.0%	15.1	11.4	B
	Subtotal	60	67	111.4%	26.4	4.9	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	242	227	93.6%	8.9	1.0	A
	Through	1,872	1,842	98.4%	5.9	0.4	A
	Right Turn	40	38	96.0%	6.1	1.6	A
	Subtotal	2,154	2,107	97.8%	6.2	0.4	A
Total		2,366	2,316	97.9%	8.3	0.4	A

Average Results from 10 RPS Conditions (With PHB on east leg at 3rd/Brooks, w/ WBLT Pocket at 3rd/Brooks)
 Volume and Delay by Movement PM Peak Hour

Intersection 25

Brooks St/2nd St

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	115	116	100.8%	30.8	4.5	D
	Through						
	Right Turn						
	Subtotal	115	116	100.8%	30.8	4.5	D
EB	Left Turn	45	48	106.7%	3.3	0.5	A
	Through	2,392	2,410	100.8%	2.8	0.2	A
	Right Turn						
	Subtotal	2,437	2,458	100.9%	2.8	0.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,552	2,574	100.9%	4.1	0.4	A

Intersection 26

Lindaro St/2nd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	91	86	94.9%	21.9	6.0	C
	Right Turn	433	402	92.9%	36.1	16.7	D
	Subtotal	524	488	93.2%	33.7	15.0	C
SB	Left Turn	117	113	96.2%	28.3	9.2	C
	Through	180	168	93.2%	19.1	3.2	B
	Right Turn						
	Subtotal	297	280	94.4%	22.9	5.9	C
EB	Left Turn	61	52	85.6%	19.5	4.1	B
	Through	2,372	2,371	100.0%	18.8	2.3	B
	Right Turn	44	41	94.3%	13.1	5.0	B
	Subtotal	2,477	2,465	99.5%	18.7	2.4	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,298	3,233	98.0%	21.5	3.4	C

Intersection 15

Brooks St/3rd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	21	20	92.9%	30.4	14.0	C
	Through	5	7	139.8%	22.9	25.4	C
	Right Turn						
	Subtotal	26	26	101.9%	30.9	7.7	C
SB	Left Turn						
	Through	5	4	88.3%	15.1	15.7	B
	Right Turn	10	12	117.8%	10.9	10.8	B
	Subtotal	15	16	107.9%	14.0	10.4	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	51	47	92.4%	6.4	1.5	A
	Through	1,401	1,345	96.0%	5.9	0.8	A
	Right Turn	10	12	117.8%	4.7	2.5	A
	Subtotal	1,462	1,404	96.0%	5.9	0.8	A
Total		1,503	1,446	96.2%	6.5	0.8	A

Intersection 16

Lindaro St/3rd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	86	83	96.3%	22.0	7.0	C
	Through	10	11	106.7%	26.5	23.7	C
	Right Turn						
	Subtotal	96	93	97.4%	21.9	6.6	C
SB	Left Turn						
	Through	40	41	102.1%	37.6	13.4	D
	Right Turn	10	11	106.7%	27.4	26.3	C
	Subtotal	50	52	103.0%	35.4	13.3	D
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	477	427	89.6%	26.9	12.6	C
	Through	1,396	1,337	95.7%	8.3	2.8	A
	Right Turn	30	26	88.3%	7.1	2.1	A
	Subtotal	1,903	1,790	94.1%	12.8	5.2	B
Total		2,049	1,935	94.5%	13.9	5.0	B

Intersection 25

Brooks St/2nd St

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	50	42	84.6%	19.0	5.1	C
	Through						
	Right Turn						
	Subtotal	50	42	84.6%	19.0	5.1	C
EB	Left Turn	25	26	103.0%	3.1	0.7	A
	Through	2,307	2,283	99.0%	2.6	0.2	A
	Right Turn						
	Subtotal	2,332	2,309	99.0%	2.6	0.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,382	2,351	98.7%	2.9	0.2	A

Intersection 26

Lindaro St/2nd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	54	53	98.8%	15.1	4.9	B
	Right Turn	281	273	97.2%	20.3	4.5	C
	Subtotal	335	326	97.4%	19.5	4.1	B
SB	Left Turn	72	64	88.9%	39.9	5.1	D
	Through	442	403	91.1%	36.5	5.0	D
	Right Turn						
	Subtotal	514	467	90.8%	37.0	4.8	D
EB	Left Turn	42	43	101.6%	13.5	3.0	B
	Through	2,289	2,244	98.0%	14.5	1.6	B
	Right Turn	61	58	95.3%	14.3	3.0	B
	Subtotal	2,392	2,345	98.0%	14.5	1.5	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,241	3,138	96.8%	18.4	2.0	B

Intersection 15

Brooks St/3rd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	42	40	94.2%	26.8	8.4	C
	Through	5	5	99.8%	29.0	27.9	C
	Right Turn						
	Subtotal	47	45	94.8%	26.9	7.6	C
SB	Left Turn						
	Through	15	15	97.3%	25.2	10.0	C
	Right Turn	10	8	84.5%	12.6	11.6	B
	Subtotal	25	23	92.2%	22.8	8.1	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	88	80	91.2%	5.3	0.9	A
	Through	1,829	1,827	99.9%	4.3	1.1	A
	Right Turn	10	7	73.0%	6.1	7.6	A
	Subtotal	1,927	1,914	99.3%	4.3	1.1	A
Total		1,999	1,982	99.1%	5.0	1.1	A

Intersection 16

Lindaro St/3rd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	132	122	92.8%	31.5	2.7	C
	Through	20	14	71.0%	29.3	6.9	C
	Right Turn						
	Subtotal	152	137	89.9%	31.6	2.4	C
SB	Left Turn						
	Through	50	53	106.8%	28.3	6.9	C
	Right Turn	10	8	84.5%	10.3	8.5	B
	Subtotal	60	62	103.0%	26.8	6.5	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	242	229	94.7%	10.1	1.1	B
	Through	1,872	1,844	98.5%	6.6	0.9	A
	Right Turn	40	44	110.4%	6.3	2.4	A
	Subtotal	2,154	2,118	98.3%	6.9	0.9	A
Total		2,366	2,316	97.9%	8.9	0.8	A

Intersection 25

Brooks St/2nd St

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	115	110	95.5%	28.9	4.5	D
	Through						
	Right Turn						
	Subtotal	115	110	95.5%	28.9	4.5	D
EB	Left Turn	45	41	92.2%	3.3	0.4	A
	Through	2,392	2,404	100.5%	2.8	0.2	A
	Right Turn						
	Subtotal	2,437	2,445	100.3%	2.8	0.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,552	2,555	100.1%	4.0	0.4	A

Intersection 26

Lindaro St/2nd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	91	81	88.6%	19.2	4.4	B
	Right Turn	433	400	92.4%	27.0	7.4	C
	Subtotal	524	481	91.7%	25.7	6.3	C
SB	Left Turn	117	104	88.6%	25.7	4.9	C
	Through	180	181	100.5%	18.8	3.4	B
	Right Turn						
	Subtotal	297	285	95.8%	21.3	2.7	C
EB	Left Turn	61	60	97.6%	18.8	5.2	B
	Through	2,372	2,356	99.3%	18.3	2.2	B
	Right Turn	44	40	89.9%	14.0	2.8	B
	Subtotal	2,477	2,455	99.1%	18.2	2.2	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,298	3,221	97.7%	19.6	2.1	B

Intersection 15 Brooks St/3rd St Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	21	21	98.1%	9.3	4.0	A
	Through	5	4	88.3%	15.0	13.0	C
	Right Turn						
	Subtotal	26	25	96.2%	10.9	4.6	B
SB	Left Turn						
	Through	5	4	81.0%	15.8	14.9	C
	Right Turn	10	10	95.7%	15.9	14.1	C
	Subtotal	15	14	90.8%	20.7	12.0	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	51	44	85.9%	2.6	0.3	A
	Through	1,401	1,357	96.8%	1.9	0.3	A
	Right Turn	10	9	88.3%	1.5	1.3	A
	Subtotal	1,462	1,409	96.4%	1.9	0.3	A
Total		1,503	1,448	96.3%	2.2	0.4	A

Intersection 16 Lindaro St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	86	72	83.9%	29.4	4.0	C
	Through	10	9	88.3%	22.7	21.6	C
	Right Turn						
	Subtotal	96	81	84.3%	28.4	4.7	C
SB	Left Turn						
	Through	40	34	85.6%	37.3	9.2	D
	Right Turn	10	14	143.5%	28.8	30.0	C
	Subtotal	50	49	97.2%	33.0	10.3	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	477	427	89.5%	20.7	10.0	C
	Through	1,396	1,350	96.7%	7.1	2.0	A
	Right Turn	30	33	110.4%	6.0	2.1	A
	Subtotal	1,903	1,810	95.1%	10.4	4.0	B
Total		2,049	1,940	94.7%	11.7	4.0	B

Intersection 25 Brooks St/2nd St Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	50	44	87.6%	16.1	5.4	C
	Through						
	Right Turn						
	Subtotal	50	44	87.6%	16.1	5.4	C
EB	Left Turn	25	25	98.6%	2.9	0.3	A
	Through	2,307	2,266	98.2%	2.6	0.3	A
	Right Turn						
	Subtotal	2,332	2,291	98.2%	2.6	0.3	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,382	2,335	98.0%	2.9	0.4	A

Intersection 26 Lindaro St/2nd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	54	48	89.3%	16.9	2.3	B
	Right Turn	281	268	95.3%	22.6	3.9	C
	Subtotal	335	316	94.4%	21.8	3.0	C
SB	Left Turn	72	61	85.4%	33.9	5.8	C
	Through	442	390	88.2%	34.7	4.6	C
	Right Turn						
	Subtotal	514	451	87.8%	34.6	4.2	C
EB	Left Turn	42	35	84.1%	14.6	4.2	B
	Through	2,289	2,229	97.4%	14.1	2.2	B
	Right Turn	61	57	94.1%	14.3	5.2	B
	Subtotal	2,392	2,321	97.0%	14.1	2.2	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,241	3,089	95.3%	17.9	1.9	B

Intersection 15 Brooks St/3rd St Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	42	39	93.3%	16.8	5.6	C
	Through	5	4	76.8%	11.7	13.4	B
	Right Turn						
	Subtotal	47	43	91.5%	17.5	6.0	C
SB	Left Turn						
	Through	15	12	79.4%	35.0	20.6	D
	Right Turn	10	13	134.4%	24.6	16.5	C
	Subtotal	25	25	101.4%	27.9	6.6	D
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	88	100	113.5%	3.0	0.4	A
	Through	1,829	1,842	100.7%	2.8	0.8	A
	Right Turn	10	9	92.2%	2.1	0.8	A
	Subtotal	1,927	1,951	101.3%	2.8	0.8	A
Total		1,999	2,019	101.0%	3.4	0.9	A

Intersection 16 Lindaro St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	132	124	94.3%	30.6	2.7	C
	Through	20	23	113.3%	28.4	9.0	C
	Right Turn						
	Subtotal	152	147	96.8%	30.3	2.3	C
SB	Left Turn						
	Through	50	57	113.7%	26.3	4.5	C
	Right Turn	10	8	76.8%	18.4	13.7	B
	Subtotal	60	65	107.5%	25.5	4.5	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	242	226	93.5%	8.5	1.6	A
	Through	1,872	1,882	100.6%	6.3	0.7	A
	Right Turn	40	43	106.6%	5.3	1.5	A
	Subtotal	2,154	2,151	99.9%	6.5	0.8	A
Total		2,366	2,363	99.9%	8.5	0.9	A

Intersection 25

Brooks St/2nd St

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	115	119	103.8%	30.8	5.2	D
	Through						
	Right Turn						
	Subtotal	115	119	103.8%	30.8	5.2	D
EB	Left Turn	45	42	93.0%	3.3	0.8	A
	Through	2,392	2,401	100.4%	2.9	0.2	A
	Right Turn						
	Subtotal	2,437	2,443	100.2%	2.9	0.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,552	2,562	100.4%	4.2	0.5	A

Intersection 26

Lindaro St/2nd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	91	91	99.6%	15.4	3.5	B
	Right Turn	433	415	96.0%	31.6	11.4	C
	Subtotal	524	506	96.6%	28.9	10.3	C
SB	Left Turn	117	105	89.9%	28.0	8.9	C
	Through	180	177	98.3%	19.8	4.0	B
	Right Turn						
	Subtotal	297	282	95.0%	22.6	5.0	C
EB	Left Turn	61	61	100.1%	20.3	2.8	C
	Through	2,372	2,351	99.1%	19.6	1.7	B
	Right Turn	44	45	103.0%	12.6	3.3	B
	Subtotal	2,477	2,458	99.2%	19.5	1.7	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,298	3,246	98.4%	21.3	1.9	C

Intersection 15

Brooks St/3rd St

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	21	18	84.1%	11.4	6.5	B
	Through	5	4	88.3%	17.1	17.0	C
	Right Turn						
	Subtotal	26	22	84.9%	12.9	5.7	B
SB	Left Turn						
	Through	5	2	44.2%	8.5	13.5	A
	Right Turn	10	11	106.7%	20.4	15.4	C
	Subtotal	15	13	85.9%	20.6	13.3	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	51	40	79.4%	3.4	0.8	A
	Through	1,401	1,340	95.6%	4.4	0.8	A
	Right Turn	10	12	117.8%	4.2	2.9	A
	Subtotal	1,462	1,392	95.2%	4.4	0.8	A
Total		1,503	1,427	95.0%	4.7	0.8	A

Intersection 16

Lindaro St/3rd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	86	90	104.8%	29.4	3.2	C
	Through	10	9	88.3%	20.7	15.3	C
	Right Turn						
	Subtotal	96	99	103.1%	28.9	3.0	C
SB	Left Turn						
	Through	40	33	81.9%	77.8	58.4	E
	Right Turn	10	8	81.0%	43.8	49.7	D
	Subtotal	50	41	81.7%	72.1	54.3	E
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	477	433	90.7%	37.9	8.1	D
	Through	1,396	1,335	95.7%	28.2	8.1	C
	Right Turn	30	32	105.5%	30.3	10.2	C
	Subtotal	1,903	1,800	94.6%	30.6	7.8	C
Total		2,049	1,940	94.7%	31.3	7.4	C

Intersection 25

Brooks St/2nd St

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	50	40	81.0%	18.8	5.3	C
	Through						
	Right Turn						
	Subtotal	50	40	81.0%	18.8	5.3	C
EB	Left Turn	25	21	83.9%	3.0	0.4	A
	Through	2,307	2,248	97.4%	2.4	0.2	A
	Right Turn						
	Subtotal	2,332	2,269	97.3%	2.4	0.2	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,382	2,310	97.0%	2.7	0.1	A

Intersection 26

Lindaro St/2nd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	54	57	105.6%	15.6	3.8	B
	Right Turn	281	278	98.9%	20.4	6.5	C
	Subtotal	335	335	100.0%	19.6	5.9	B
SB	Left Turn	72	64	88.9%	39.8	4.0	D
	Through	442	399	90.3%	38.5	2.8	D
	Right Turn						
	Subtotal	514	463	90.1%	38.7	2.8	D
EB	Left Turn	42	43	103.4%	13.5	3.7	B
	Through	2,289	2,204	96.3%	13.4	1.8	B
	Right Turn	61	58	95.3%	12.5	3.7	B
	Subtotal	2,392	2,306	96.4%	13.4	1.9	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,241	3,104	95.8%	17.9	1.7	B

Intersection 15 Brooks St/3rd St Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	42	41	96.9%	20.8	7.8	C
	Through	5	7	138.2%	29.5	19.6	D
	Right Turn						
	Subtotal	47	48	101.3%	22.8	7.7	C
SB	Left Turn						
	Through	15	15	99.8%	20.8	10.6	C
	Right Turn	10	10	96.0%	14.2	8.2	B
	Subtotal	25	25	98.3%	18.2	7.3	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	88	78	88.1%	3.6	0.2	A
	Through	1,829	1,764	96.5%	3.9	0.4	A
	Right Turn	10	9	92.2%	3.1	1.9	A
	Subtotal	1,927	1,851	96.1%	3.8	0.4	A
Total		1,999	1,923	96.2%	4.5	0.4	A

Intersection 16 Lindaro St/3rd St Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	132	126	95.7%	23.1	2.9	C
	Through	20	19	96.0%	25.3	13.3	C
	Right Turn						
	Subtotal	152	146	95.7%	23.3	2.8	C
SB	Left Turn						
	Through	50	45	90.6%	25.9	4.4	C
	Right Turn	10	12	119.0%	22.8	7.9	C
	Subtotal	60	57	95.4%	25.4	3.9	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	242	237	97.9%	24.6	7.2	C
	Through	1,872	1,768	94.5%	22.4	6.2	C
	Right Turn	40	35	86.4%	18.7	5.8	B
	Subtotal	2,154	2,040	94.7%	22.6	6.2	C
Total		2,366	2,243	94.8%	22.7	5.7	C

Intersection 25

Brooks St/2nd St

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	115	101	87.5%	30.1	7.0	D
	Through						
	Right Turn						
	Subtotal	115	101	87.5%	30.1	7.0	D
EB	Left Turn	45	44	97.3%	3.4	0.6	A
	Through	2,392	2,347	98.1%	2.7	0.3	A
	Right Turn						
	Subtotal	2,437	2,390	98.1%	2.7	0.3	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,552	2,491	97.6%	3.8	0.4	A

Intersection 26

Lindaro St/2nd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	91	86	94.9%	20.5	6.4	C
	Right Turn	433	398	92.0%	39.3	14.0	D
	Subtotal	524	485	92.5%	35.8	12.3	D
SB	Left Turn	117	111	94.5%	25.9	7.5	C
	Through	180	176	97.7%	17.9	3.6	B
	Right Turn						
	Subtotal	297	286	96.5%	20.8	4.4	C
EB	Left Turn	61	51	84.4%	17.4	2.8	B
	Through	2,372	2,316	97.6%	17.3	2.0	B
	Right Turn	44	40	90.8%	11.9	4.2	B
	Subtotal	2,477	2,407	97.2%	17.2	1.9	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,298	3,178	96.4%	20.3	2.8	C

Intersection 15

Brooks St/3rd St

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	21	19	91.1%	11.1	4.1	B
	Through	5	4	81.0%	13.9	12.0	B
	Right Turn						
	Subtotal	26	23	89.2%	12.7	5.6	B
SB	Left Turn						
	Through	5	3	66.2%	20.1	24.6	C
	Right Turn	10	11	110.4%	23.9	17.7	C
	Subtotal	15	14	95.7%	29.7	19.2	D
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	56	49	87.4%	3.2	0.4	A
	Through	1,435	1,400	97.6%	4.3	1.1	A
	Right Turn	10	7	66.2%	3.7	3.2	A
	Subtotal	1,501	1,456	97.0%	4.2	1.1	A
Total		1,542	1,493	96.8%	4.6	1.1	A

Intersection 16

Lindaro St/3rd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	96	98	102.4%	30.0	3.2	C
	Through						
	Right Turn						
	Subtotal	96	98	102.4%	30.0	3.2	C
SB	Left Turn						
	Through						
	Right Turn	49	48	98.4%	12.5	2.5	B
	Subtotal	49	48	98.4%	12.5	2.5	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	477	427	89.4%	29.9	6.0	C
	Through	1,426	1,379	96.7%	24.5	5.4	C
	Right Turn	55	46	84.3%	0.4	0.2	A
	Subtotal	1,958	1,852	94.6%	25.1	5.3	C
Total		2,103	1,998	95.0%	25.0	4.8	C

Intersection 25

Brooks St/2nd St

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	55	49	89.0%	21.5	4.4	C
	Through						
	Right Turn						
	Subtotal	55	49	89.0%	21.5	4.4	C
EB	Left Turn	25	24	94.2%	2.5	0.9	A
	Through	2,307	2,257	97.8%	2.6	0.3	A
	Right Turn						
	Subtotal	2,332	2,280	97.8%	2.6	0.3	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,387	2,329	97.6%	3.0	0.3	A

Intersection 26

Lindaro St/2nd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	54	53	98.8%	16.6	3.9	B
	Right Turn	281	282	100.4%	25.4	8.6	C
	Subtotal	335	336	100.2%	24.3	7.6	C
SB	Left Turn	66	52	78.6%	37.2	9.8	D
	Through	408	365	89.6%	34.0	3.0	C
	Right Turn						
	Subtotal	474	417	88.0%	34.4	3.1	C
EB	Left Turn	42	45	107.8%	16.8	6.3	B
	Through	2,294	2,219	96.7%	14.6	2.8	B
	Right Turn	61	58	95.3%	11.7	4.5	B
	Subtotal	2,397	2,323	96.9%	14.6	2.8	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,206	3,076	95.9%	18.3	2.8	B

Intersection 15

Brooks St/3rd St

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	42	46	108.8%	20.9	6.4	C
	Through	5	3	69.1%	28.3	27.2	D
	Right Turn						
	Subtotal	47	49	104.6%	21.9	7.3	C
SB	Left Turn						
	Through	15	18	120.3%	21.0	8.3	C
	Right Turn	10	11	111.4%	23.6	12.6	C
	Subtotal	25	29	116.7%	23.4	5.6	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	104	85	82.0%	4.1	0.6	A
	Through	1,859	1,820	97.9%	4.7	0.9	A
	Right Turn	10	10	99.8%	3.9	1.5	A
	Subtotal	1,973	1,915	97.1%	4.7	0.9	A
Total		2,045	1,993	97.5%	5.4	0.9	A

Intersection 16

Lindaro St/3rd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	152	147	96.5%	22.6	1.9	C
	Through						
	Right Turn						
	Subtotal	152	147	96.5%	22.6	1.9	C
SB	Left Turn						
	Through						
	Right Turn	81	80	99.1%	16.8	4.6	B
	Subtotal	81	80	99.1%	16.8	4.6	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	242	235	97.0%	28.7	5.4	C
	Through	1,912	1,821	95.2%	26.0	6.8	C
	Right Turn	170	163	96.0%	0.8	0.2	A
	Subtotal	2,324	2,218	95.5%	24.4	6.1	C
Total		2,557	2,445	95.6%	24.1	5.5	C

Intersection 25

Brooks St/2nd St

Side-street Stop

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	131	113	85.9%	31.0	5.3	D
	Through						
	Right Turn						
	Subtotal	131	113	85.9%	31.0	5.3	D
EB	Left Turn	45	45	99.0%	3.2	0.5	A
	Through	2,392	2,409	100.7%	2.9	0.3	A
	Right Turn						
	Subtotal	2,437	2,454	100.7%	2.9	0.3	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,568	2,566	99.9%	4.1	0.4	A

Intersection 26

Lindaro St/2nd St

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	91	81	89.0%	19.2	4.6	B
	Right Turn	433	413	95.4%	43.4	16.9	D
	Subtotal	524	494	94.3%	39.4	14.7	D
SB	Left Turn	97	98	100.6%	20.2	20.7	C
	Through	150	141	94.2%	13.6	15.2	B
	Right Turn						
	Subtotal	247	239	96.7%	16.3	17.8	B
EB	Left Turn	61	61	100.1%	19.3	5.0	B
	Through	2,388	2,360	98.8%	19.5	3.0	B
	Right Turn	44	44	100.4%	15.9	5.5	B
	Subtotal	2,493	2,465	98.9%	19.5	3.1	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		3,264	3,198	98.0%	22.3	4.4	C

Arterial Level of Service: EB 2nd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
D	IV	25	18.1	36.1	54.2	0.07	4.5	F
C	IV	25	18.9	8.9	27.8	0.07	9.2	D
B	IV	25	17.9	30.9	48.8	0.07	5.0	F
A	IV	25	18.5	9.7	28.2	0.07	8.9	E
Lindaro	IV	25	25.3	41.9	67.2	0.14	7.5	E
Lincoln	IV	25	21.4	46.9	68.3	0.10	5.1	F
Francisco W.	IV	25	12.2	71.5	83.7	0.05	2.0	F
101 SBO on 2nd	IV	25	14.2	11.7	25.9	0.05	7.4	E
Total	IV		146.5	257.6	404.1	0.61	5.5	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	102.6	121.6	0.07	2.1	F
Tamalpais	IV	25	14.4	101.5	115.9	0.05	1.7	F
Lincoln	IV	25	13.2	77.0	90.2	0.05	2.0	F
Lindaro	IV	25	21.4	1.1	22.5	0.10	15.6	C
A	IV	25	19.5	10.1	29.6	0.07	8.9	E
B	IV	25	17.9	9.3	27.2	0.07	8.9	E
C	IV	25	19.0	3.6	22.6	0.07	11.4	D
D	IV	25	18.7	1.7	20.4	0.07	12.4	D
Total	IV		143.1	306.9	450.0	0.56	4.5	F

Arterial Level of Service: SB Hetherton

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Mission	IV	29	24.0	21.5	45.5	0.16	12.6	D
5th	IV	25	16.3	12.9	29.2	0.06	7.6	E
4th	IV	25	14.6	7.5	22.1	0.05	8.9	E
3rd	IV	25	17.7	7.5	25.2	0.07	9.5	D
2nd	IV	25	15.6	261.4	277.0	0.06	0.8	F
Total	IV		88.2	310.8	399.0	0.40	3.6	F

Arterial Level of Service: NB Irwin

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
2nd St	IV	30	25.2	84.6	109.8	0.17	5.5	F
3rd St	IV	25	14.8	28.5	43.3	0.06	4.6	F
4th	IV	25	18.3	30.9	49.2	0.07	5.0	F
5th	IV	25	14.6	8.5	23.1	0.06	8.6	E
Mission	IV	25	15.7	6.8	22.5	0.06	9.5	D
Total	IV		88.6	159.3	247.9	0.41	5.9	F

Arterial Level of Service: EB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lincoln	IV	25	28.5	15.7	44.2	0.16	12.9	D
Tamalpais	IV	25	16.0	52.8	68.8	0.06	3.2	F
Tamalpais	IV	25	3.1	2.9	6.0	0.01	7.0	E
Hetherton	IV	25	8.7	21.6	30.3	0.03	3.9	F
Irwin	IV	25	18.9	12.1	31.0	0.07	8.3	E
Total	IV		75.2	105.1	180.3	0.33	6.7	F

Arterial Level of Service: WB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Irwin	IV	25	21.6	26.8	48.4	0.10	7.3	E
Hetherton	IV	25	18.9	36.1	55.0	0.07	4.7	F
Tamalpais	IV	25	8.7	82.6	91.3	0.03	1.3	F
Tamalpais	IV	25	3.1	3.7	6.8	0.01	6.2	F
Lincoln	IV	25	16.0	88.7	104.7	0.06	2.1	F
Total	IV		68.3	237.9	306.2	0.27	3.2	F

Arterial Level of Service: EB 2nd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
D	IV	25	18.1	24.8	42.9	0.07	5.7	F
C	IV	25	18.9	8.5	27.4	0.07	9.4	D
B	IV	25	17.9	19.0	36.9	0.07	6.6	F
A	IV	25	18.5	9.7	28.2	0.07	8.9	E
Lindaro	IV	25	25.3	43.6	68.9	0.14	7.3	E
Lincoln	IV	25	21.4	26.7	48.1	0.10	7.3	E
Francisco W.	IV	25	12.2	89.5	101.7	0.05	1.6	F
101 SBO on Hetherton	IV	25	14.2	82.3	96.5	0.05	2.0	F
Total	IV		146.5	304.1	450.6	0.61	4.9	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	96.2	115.2	0.07	2.2	F
Tamalpais	IV	25	14.4	100.0	114.4	0.05	1.7	F
Lincoln	IV	25	13.2	18.9	32.1	0.05	5.6	F
Lindaro	IV	25	21.4	4.1	25.5	0.10	13.7	C
A	IV	25	19.5	11.1	30.6	0.07	8.6	E
B	IV	25	17.9	10.2	28.1	0.07	8.6	E
C	IV	25	19.0	4.4	23.4	0.07	11.0	D
D	IV	25	18.7	3.9	22.6	0.07	11.2	D
Total	IV		143.1	248.8	391.9	0.56	5.1	F

Arterial Level of Service: SB Hetherton

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Mission	IV	35	22.2	19.0	41.2	0.16	13.9	C
5th	IV	25	16.3	16.2	32.5	0.06	6.8	F
4th	IV	25	14.6	5.6	20.2	0.05	9.8	D
3rd	IV	25	17.7	21.9	39.6	0.07	6.1	F
2nd	IV	25	15.6	55.6	71.2	0.06	3.0	F
Total	IV		86.4	118.3	204.7	0.40	7.1	E

Arterial Level of Service: NB Irwin

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
2nd St	IV	38	19.3	44.6	63.9	0.17	9.5	D
3rd St	IV	25	14.8	12.9	27.7	0.06	7.2	E
4th	IV	25	18.9	12.2	31.1	0.07	8.3	E
5th	IV	25	14.0	14.3	28.3	0.05	6.7	F
Mission	IV	25	15.7	3.4	19.1	0.06	11.2	D
Total	IV		82.7	87.4	170.1	0.41	8.6	E

Arterial Level of Service: EB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Lincoln	IV	25	28.5	12.8	41.3	0.16	13.8	C
Tamalpais	IV	25	16.1	24.0	40.1	0.06	5.5	F
Tamalpais	IV	25	4.3	2.3	6.6	0.02	8.9	E
Hetherton	IV	25	7.5	16.6	24.1	0.03	4.2	F
Irwin	IV	25	18.9	14.5	33.4	0.07	7.7	E
Total	IV		75.3	70.2	145.5	0.33	8.3	E

Arterial Level of Service: WB Mission

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Irwin	IV	25	21.6	28.4	50.0	0.10	7.1	E
Hetherton	IV	25	18.9	15.9	34.8	0.07	7.4	E
Tamalpais	IV	25	7.5	47.1	54.6	0.03	1.9	F
Tamalpais	IV	25	4.3	2.7	7.0	0.02	8.4	E
Lincoln	IV	25	16.1	88.2	104.3	0.06	2.1	F
Total	IV		68.4	182.3	250.7	0.27	3.9	F

Arterial Level of Service: EB 2nd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
D	IV	25	18.1	36.1	54.2	0.07	4.5	F
C	IV	25	18.9	8.9	27.8	0.07	9.2	D
B	IV	25	17.9	30.9	48.8	0.07	5.0	F
A	IV	25	18.5	9.7	28.2	0.07	8.9	E
Brooks	IV	25	12.3	3.9	16.2	0.05	10.4	D
Lindaro	IV	25	20.6	44.5	65.1	0.09	5.2	F
Lincoln	IV	25	21.4	46.9	68.3	0.10	5.1	F
Francisco W.	IV	25	12.2	71.5	83.7	0.05	2.0	F
101 SBO on 2nd	IV	25	14.2	11.7	25.9	0.05	7.4	E
Total	IV		154.1	264.1	418.2	0.61	5.3	F

Arterial Level of Service: EB 2nd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
D	IV	25	18.1	24.8	42.9	0.07	5.7	F
C	IV	25	18.9	8.5	27.4	0.07	9.4	D
B	IV	25	17.9	19.0	36.9	0.07	6.6	F
A	IV	25	18.5	9.7	28.2	0.07	8.9	E
Brooks	IV	25	12.3	4.8	17.1	0.05	9.8	D
Lindaro	IV	25	20.6	44.6	65.2	0.09	5.2	F
Lincoln	IV	25	21.4	26.7	48.1	0.10	7.3	E
Francisco W.	IV	25	12.2	89.5	101.7	0.05	1.6	F
101 SBO on Hetherton	IV	25	14.2	82.3	96.5	0.05	2.0	F
Total	IV		154.1	309.9	464.0	0.61	4.8	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	102.2	121.2	0.07	2.1	F
Tamalpais	IV	25	14.4	101.5	115.9	0.05	1.7	F
Lincoln	IV	25	13.2	74.4	87.6	0.05	2.1	F
Lindaro	IV	25	21.4	1.1	22.5	0.10	15.6	C
A	IV	25	19.5	5.2	24.7	0.07	10.7	D
B	IV	25	17.9	5.4	23.3	0.07	10.4	D
C	IV	25	19.0	1.8	20.8	0.07	12.4	D
D	IV	25	18.7	2.3	21.0	0.07	12.1	D
Total	IV		143.1	293.9	437.0	0.56	4.6	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	96.2	115.2	0.07	2.2	F
Tamalpais	IV	25	14.4	100.0	114.4	0.05	1.7	F
Lincoln	IV	25	13.2	18.9	32.1	0.05	5.6	F
Lindaro	IV	25	21.4	4.1	25.5	0.10	13.7	C
A	IV	25	19.5	14.5	34.0	0.07	7.8	E
B	IV	25	17.9	8.8	26.7	0.07	9.1	D
C	IV	25	19.0	4.4	23.4	0.07	11.0	D
D	IV	25	18.7	3.9	22.6	0.07	11.2	D
Total	IV		143.1	250.8	393.9	0.56	5.1	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	102.2	121.2	0.07	2.1	F
Tamalpais	IV	25	14.4	101.5	115.9	0.05	1.7	F
Lincoln	IV	25	13.2	77.0	90.2	0.05	2.0	F
Lindaro	IV	25	21.4	1.1	22.5	0.10	15.6	C
Pedestrian Hybrid Be	IV	25	4.3	0.2	4.5	0.02	12.9	D
A	IV	25	15.2	6.2	21.4	0.06	9.7	D
B	IV	25	17.9	5.5	23.4	0.07	10.4	D
C	IV	25	19.0	1.8	20.8	0.07	12.4	D
D	IV	25	18.7	2.3	21.0	0.07	12.1	D
Total	IV		143.1	297.8	440.9	0.56	4.5	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	96.2	115.2	0.07	2.2	F
Tamalpais	IV	25	14.4	100.0	114.4	0.05	1.7	F
Lincoln	IV	25	13.2	18.9	32.1	0.05	5.6	F
Lindaro	IV	25	21.4	4.1	25.5	0.10	13.7	C
Pedestrian Hybrid Be	IV	25	4.3	2.1	6.4	0.02	9.1	D
A	IV	25	15.2	20.8	36.0	0.06	5.7	F
B	IV	25	17.9	10.3	28.2	0.07	8.6	E
C	IV	25	19.0	4.4	23.4	0.07	11.0	D
D	IV	25	18.7	3.9	22.6	0.07	11.2	D
Total	IV		143.1	260.7	403.8	0.56	5.0	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	102.2	121.2	0.07	2.1	F
Tamalpais	IV	25	14.4	101.5	115.9	0.05	1.7	F
Lincoln	IV	25	13.2	77.0	90.2	0.05	2.0	F
Lindaro	IV	25	21.4	1.1	22.5	0.10	15.6	C
Brooks	IV	25	6.7	1.3	8.0	0.03	11.4	D
A	IV	25	12.7	4.1	16.8	0.05	10.3	D
B	IV	25	17.9	5.5	23.4	0.07	10.4	D
C	IV	25	19.0	1.8	20.8	0.07	12.4	D
D	IV	25	18.7	2.3	21.0	0.07	12.1	D
Total	IV		143.0	296.8	439.8	0.56	4.6	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	96.2	115.2	0.07	2.2	F
Tamalpais	IV	25	14.4	100.0	114.4	0.05	1.7	F
Lincoln	IV	25	13.2	18.9	32.1	0.05	5.6	F
Lindaro	IV	25	21.4	4.1	25.5	0.10	13.7	C
Brooks	IV	25	6.7	1.0	7.7	0.03	11.9	D
A	IV	25	12.7	11.7	24.4	0.05	7.1	E
B	IV	25	17.9	10.2	28.1	0.07	8.6	E
C	IV	25	19.0	4.4	23.4	0.07	11.0	D
D	IV	25	18.7	3.9	22.6	0.07	11.2	D
Total	IV		143.0	250.4	393.4	0.56	5.1	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	102.2	121.2	0.07	2.1	F
Tamalpais	IV	25	14.4	101.5	115.9	0.05	1.7	F
Lincoln	IV	25	13.2	77.0	90.2	0.05	2.0	F
Lindaro	IV	25	21.4	1.0	22.4	0.10	15.6	C
A	IV	25	19.5	4.9	24.4	0.07	10.8	D
B	IV	25	17.9	5.5	23.4	0.07	10.4	D
C	IV	25	19.0	1.9	20.9	0.07	12.3	D
D	IV	25	18.7	2.4	21.1	0.07	12.0	D
Total	IV		143.1	296.4	439.5	0.56	4.6	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	96.2	115.2	0.07	2.2	F
Tamalpais	IV	25	14.4	100.0	114.4	0.05	1.7	F
Lincoln	IV	25	13.2	18.9	32.1	0.05	5.6	F
Lindaro	IV	25	21.4	3.8	25.2	0.10	13.9	C
A	IV	25	19.5	11.1	30.6	0.07	8.6	E
B	IV	25	17.9	10.2	28.1	0.07	8.6	E
C	IV	25	19.0	4.4	23.4	0.07	11.0	D
D	IV	25	18.7	3.9	22.6	0.07	11.2	D
Total	IV		143.1	248.5	391.6	0.56	5.1	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	102.2	121.2	0.07	2.1	F
Tamalpais	IV	25	14.4	101.5	115.9	0.05	1.7	F
Lincoln	IV	25	13.2	74.4	87.6	0.05	2.1	F
Lindaro	IV	25	21.4	6.8	28.2	0.10	12.4	D
Lootens	IV	25	5.1	1.0	6.1	0.02	11.4	D
A	IV	25	19.5	5.5	25.0	0.07	10.6	D
B	IV	25	17.9	6.2	24.1	0.07	10.1	D
C	IV	25	19.0	1.9	20.9	0.07	12.3	D
D	IV	25	18.7	2.4	21.1	0.07	12.0	D
Total	IV		148.2	301.9	450.1	0.58	4.6	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	96.2	115.2	0.07	2.2	F
Tamalpais	IV	25	14.4	100.0	114.4	0.05	1.7	F
Lincoln	IV	25	13.2	18.9	32.1	0.05	5.6	F
Lindaro	IV	25	21.4	24.9	46.3	0.10	7.6	E
Lootens	IV	25	5.1	1.8	6.9	0.02	10.1	D
A	IV	25	19.5	11.0	30.5	0.07	8.7	E
B	IV	25	17.9	10.4	28.3	0.07	8.6	E
C	IV	25	19.0	4.4	23.4	0.07	11.0	D
D	IV	25	18.7	3.9	22.6	0.07	11.2	D
Total	IV		148.2	271.5	419.7	0.58	4.9	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	102.2	121.2	0.07	2.1	F
Tamalpais	IV	25	14.4	101.5	115.9	0.05	1.7	F
Lincoln	IV	25	13.2	85.2	98.4	0.05	1.8	F
Lindaro	IV	25	21.4	1.0	22.4	0.10	15.6	C
A	IV	25	19.5	5.4	24.9	0.07	10.6	D
B	IV	25	17.9	5.4	23.3	0.07	10.4	D
C	IV	25	19.0	1.8	20.8	0.07	12.4	D
D	IV	25	18.7	2.3	21.0	0.07	12.1	D
Total	IV		143.1	304.8	447.9	0.56	4.5	F

Arterial Level of Service: WB 3rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hetherton	IV	25	19.0	96.2	115.2	0.07	2.2	F
Tamalpais	IV	25	14.4	100.0	114.4	0.05	1.7	F
Lincoln	IV	25	13.2	18.9	32.1	0.05	5.6	F
Lindaro	IV	25	21.4	25.3	46.7	0.10	7.5	E
Lootens	IV	25	5.1	1.4	6.5	0.02	10.7	D
A	IV	25	19.5	12.4	31.9	0.07	8.3	E
B	IV	25	17.9	10.1	28.0	0.07	8.7	E
C	IV	25	19.0	4.4	23.4	0.07	11.0	D
D	IV	25	18.7	3.9	22.6	0.07	11.2	D
Total	IV		148.2	272.6	420.8	0.58	4.9	F

Leisch Method for Weaving Analysis

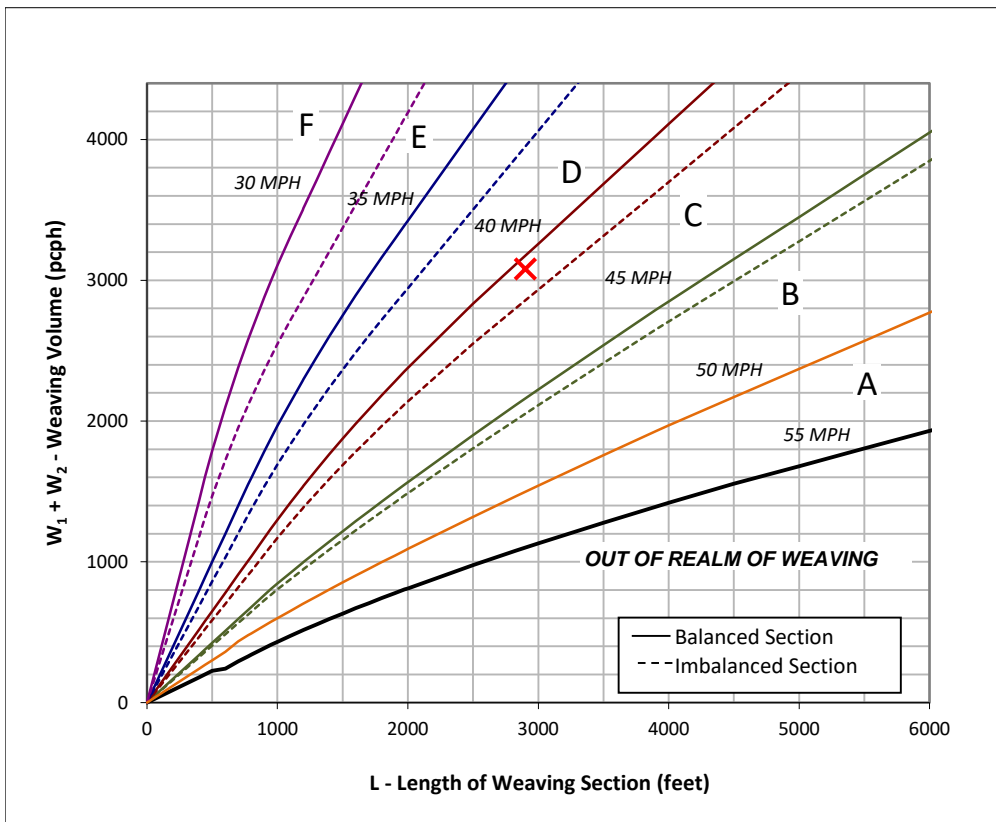
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	5
Length of Weaving Section (feet)	L	2,900

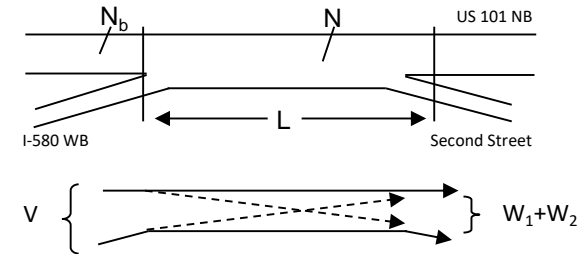
Project Information

Project	BioMarin
Scenario	Cumulative Plus Project AM Peak Hour
Freeway	US 101 NB
On-ramp	I-580 WB
Off-ramp	Second Street

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	6,045	Volume (vph)*	1,950	Volume (vph)*	1,004
Truck Percentage	4%	Truck Percentage	4%	Truck Percentage	4%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	2.0
Volume (pcph)	6,311	Volume (pcph)	2,036	Volume (pcph)	1,045



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
40 MPH and 45 MPH
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 38.6
- Weaving Intensity Factor (k) 2.61
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,599
- Level of Service (LOS) D

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Cumulative Plus Project Conditions
Project Description	BioMarin - US 101 NB Second Street to Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	4150	Heavy Vehicle Adjustment Factor (f _{HV})	0.919
Peak Hour Factor (PHF)	0.99	Flow Rate (v _{GP}), pc/h/ln	1520
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c _{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.66
Passenger Car Equivalent (E _T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f _{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f _{RLC})	-	Density (D _{GP}), pc/mi/ln	25.3
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS _{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	718	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	820
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.50
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.8
Speed 2 (S_2), mi/h	0.2	Density (D_{ML}), pc/mi/ln	13.7
Speed 2 (S_3), mi/h	1.4	Level of Service (LOS)	B

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Cumulative Plus Project Conditions
Project Description	BioMarin - US 101 NB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	4	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	2.86
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	1.02
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	6025	Heavy Vehicle Adjustment Factor (f _{HV})	0.889
Peak Hour Factor (PHF)	0.99	Flow Rate (v _{p,GP}), pc/h/ln	1712
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c _{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.74
Passenger Car Equivalent (E _T)	3.840		

General Purpose Speed and Density

Lane Width Adjustment (f _{LW})	-	Average Speed (S), mi/h	59.8
Right-Side Lateral Clearance Adj. (f _{RLC})	-	Density (D _{GP}), pc/mi/ln	28.6
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS _{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	2.86

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1039	Heavy Vehicle Adjustment Factor (f_{HV})	0.916
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1246
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.76
Passenger Car Equivalent (E_T)	5.597		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	58.3
Speed 2 (S_2), mi/h	1.7	Density (D_{ML}), pc/mi/ln	21.4
Speed 2 (S_3), mi/h	7.7	Level of Service (LOS)	C

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	4/24/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Cumulative Plus Project Conditions
Project Description	BioMarin - US 101 SB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	-2.44
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	0.77
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	6281	Heavy Vehicle Adjustment Factor (f_{HV})	0.951
Peak Hour Factor (PHF)	0.97	Flow Rate ($v_{p,GP}$), pc/h/ln	2270
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c_{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.99
Passenger Car Equivalent (E_T)	2.180		

General Purpose Speed and Density

Lane Width Adjustment (f_{LW})	-	Average Speed (S), mi/h	51.9
Right-Side Lateral Clearance Adj. (f_{RLC})	-	Density (D_{GP}), pc/mi/ln	43.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1317	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.94	Flow Rate ($V_{p,ML}$), pc/h/ln	1440
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (E_T)	2.390		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	1
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	44.8
Speed 2 (S_2), mi/h	3.0	Density (D_{ML}), pc/mi/ln	32.1
Speed 2 (S_3), mi/h	12.2	Level of Service (LOS)	D

HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	3/17/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Cumulative Plus Project Conditions
Project Description	BioMarin - US 101 Mission Ave Slip Off-Ramp		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	3	1
Free-Flow Speed (FFS), mi/h	60.0	50.0
Segment Length (L) / Deceleration Length (L _D), ft	1500	170
Terrain Type	Specific Grade	Specific Grade
Percent Grade, %	-2.44	-1.80
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Volume (V _i), veh/h	6281	2047
Peak Hour Factor (PHF)	0.97	0.92
Total Trucks, %	4.40	3.72
Single-Unit Trucks (SUT), %	66	66
Tractor-Trailers (TT), %	34	34
Heavy Vehicle Adjustment Factor (f _{HV})	0.951	0.958
Flow Rate (v _i), pc/h	6809	2323
Capacity (c), pc/h	6900	2100
Volume-to-Capacity Ratio (v/c)	0.99	1.11

Speed and Density

Upstream Equilibrium Distance (L _{EQ}), ft	111124.6	Density in Ramp Influence Area (D _R), pc/mi/ln	-
Distance to Upstream Ramp (L _{UP}), ft	10000	Speed Index (D _S)	-
Downstream Equilibrium Distance (L _{EQ}), ft	-	Flow Outer Lanes (v _{OA}), pc/h/ln	2319
Distance to Downstream Ramp (L _{DOWN}), ft	10000	Off-Ramp Influence Area Speed (S _R), mi/h	-
Prop. Freeway Vehicles in Lane 1 and 2 (P _{FD})	0.483	Outer Lanes Freeway Speed (S _O), mi/h	60.7
Flow in Lanes 1 and 2 (v ₁₂), pc/h	4490	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (v _{R12}), pc/h	-	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44
Managed Lane Adjustment Factors			
Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V_{ML}), veh/h	1317	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.94	Flow Rate ($V_{p,ML}$), pc/h/ln	1440
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (E_T)	2.390		
Managed Lane Speed and Density			
Breakpoint (BP_{ML})	501	Indicator Variable	1
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	44.8
Speed 2 (S_2), mi/h	3.0	Density (D_{ML}), pc/mi/ln	32.1
Speed 2 (S_3), mi/h	12.2	Level of Service (LOS)	D

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	AM Peak Hour, Cumulative Plus Project Conditions
Project Description	BioMarin - US 101 SB Mission Avenue to Second Street		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	4234	Heavy Vehicle Adjustment Factor (f _{HV})	0.919
Peak Hour Factor (PHF)	0.97	Flow Rate (v _{GP}), pc/h/ln	1583
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c _{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.69
Passenger Car Equivalent (E _T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f _{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f _{RLC})	-	Density (D _{GP}), pc/mi/ln	26.4
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS _{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	998	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.94	Flow Rate ($V_{p,ML}$), pc/h/ln	1104
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.67
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.0
Speed 2 (S_2), mi/h	1.0	Density (D_{ML}), pc/mi/ln	18.7
Speed 2 (S_3), mi/h	5.0	Level of Service (LOS)	C

Leisch Method for Weaving Analysis

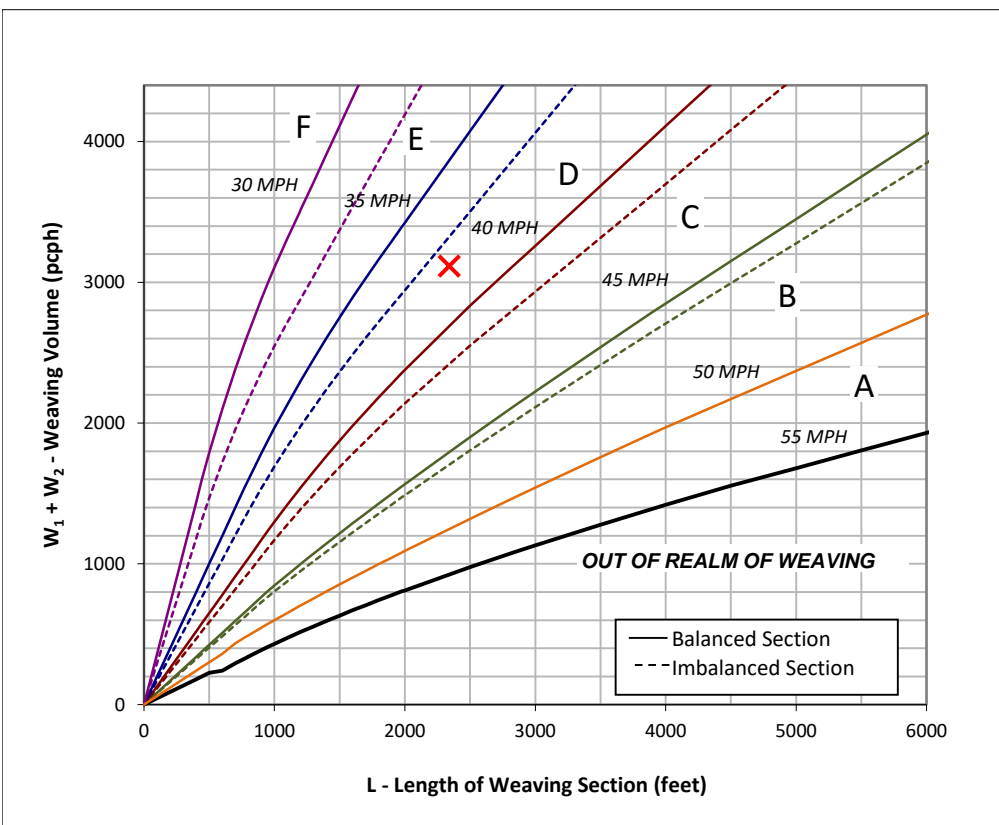
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	2,340

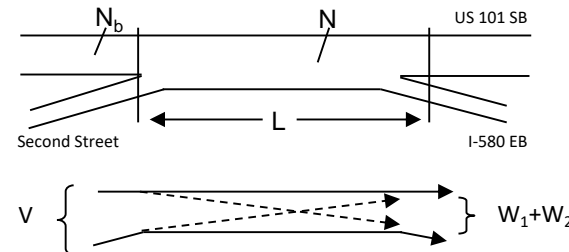
Project Information

Project	BioMarin
Scenario	Cumulative Plus Project AM Peak Hour
Freeway	US 101 SB
On-ramp	Second Street
Off-ramp	I-580 EB

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	6,727	Volume (vph)*	1,771	Volume (vph)*	1,226
Truck Percentage	4%	Truck Percentage	3%	Truck Percentage	2%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	4.1
Volume (pcph)	7,023	Volume (pcph)	1,818	Volume (pcph)	1,299



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
35 MPH and 40 MPH
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 38.2
- Weaving Intensity Factor (k) 2.63
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 2,286
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

Leisch Method for Weaving Analysis

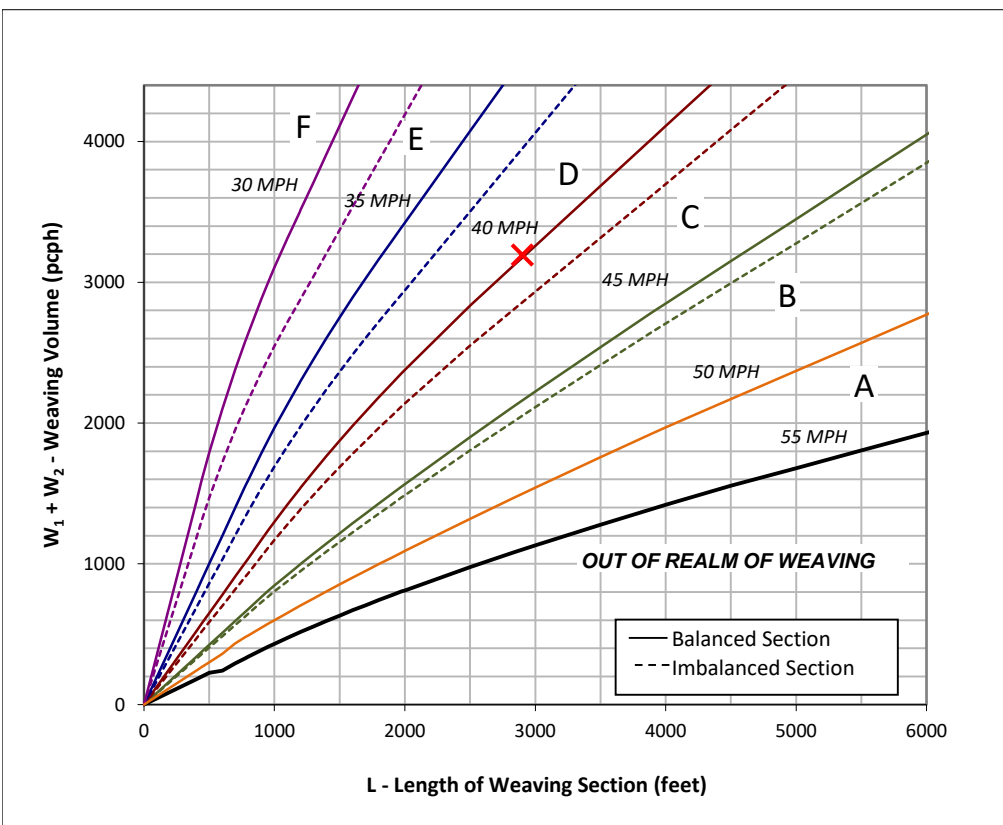
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	5
Length of Weaving Section (feet)	L	2,900

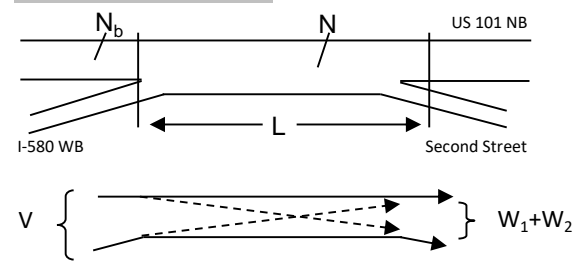
Project Information

Project	BioMarin
Scenario	Cumulative Plus Project PM Peak Hour
Freeway	US 101 NB
On-ramp	I-580 WB
Off-ramp	Second Street

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	7,267	Volume (vph)*	1,662	Volume (vph)*	1,423
Truck Percentage	4%	Truck Percentage	4%	Truck Percentage	3%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	2.0
Volume (pcph)	7,587	Volume (pcph)	1,735	Volume (pcph)	1,460



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
35 MPH and 40 MPH
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 38.5
- Weaving Intensity Factor (k) 2.62
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,989
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Cumulative + Project Conditions
Project Description	BioMarin - US 101 NB Second Street to Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	5170	Heavy Vehicle Adjustment Factor (f _{HV})	0.919
Peak Hour Factor (PHF)	0.98	Flow Rate (v _{p,GP}), pc/h/ln	1913
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c _{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.83
Passenger Car Equivalent (E _T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f _{LW})	-	Average Speed (S), mi/h	58.2
Right-Side Lateral Clearance Adj. (f _{RLC})	-	Density (D _{GP}), pc/mi/ln	32.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS _{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	848	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.99	Flow Rate ($V_{p,ML}$), pc/h/ln	890
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.54
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.7
Speed 2 (S_2), mi/h	0.3	Density (D_{ML}), pc/mi/ln	14.9
Speed 2 (S_3), mi/h	2.1	Level of Service (LOS)	B

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	Cumulative + Project Conditions, PM Peak Hour
Project Description	BioMarin - US 101 NB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	4	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	2.86
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	1.02
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	7518	Heavy Vehicle Adjustment Factor (f _{HV})	0.889
Peak Hour Factor (PHF)	0.98	Flow Rate (v _{p,GP}), pc/h/ln	2157
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c _{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.94
Passenger Car Equivalent (E _T)	3.840		

General Purpose Speed and Density

Lane Width Adjustment (f _{LW})	-	Average Speed (S), mi/h	54.4
Right-Side Lateral Clearance Adj. (f _{RLC})	-	Density (D _{GP}), pc/mi/ln	39.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS _{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	2.86

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1217	Heavy Vehicle Adjustment Factor (f_{HV})	0.916
Peak Hour Factor	0.99	Flow Rate ($V_{p,ML}$), pc/h/ln	1342
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.81
Passenger Car Equivalent (E_T)	5.597		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	1
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	47.9
Speed 2 (S_2), mi/h	2.3	Density (D_{ML}), pc/mi/ln	28.0
Speed 2 (S_3), mi/h	9.8	Level of Service (LOS)	D

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	4/24/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Cumulative Plus Project Conditions
Project Description	BioMarin - US 101 SB north of Mission Avenue		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Specific Grade
Segment Length (L), ft	-	Percent Grade, %	-2.44
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	0.77
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	5449	Heavy Vehicle Adjustment Factor (f _{HV})	0.951
Peak Hour Factor (PHF)	0.97	Flow Rate (v _{p,GP}), pc/h/ln	1969
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (c _{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.86
Passenger Car Equivalent (E _T)	2.180		

General Purpose Speed and Density

Lane Width Adjustment (f _{LW})	-	Average Speed (S), mi/h	57.5
Right-Side Lateral Clearance Adj. (f _{RLC})	-	Density (D _{GP}), pc/mi/ln	34.2
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS _{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	1377	Heavy Vehicle Adjustment Factor (f_{HV})	0.973
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1555
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.94
Passenger Car Equivalent (E_T)	2.390		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	56.0
Speed 2 (S_2), mi/h	4.0	Density (D_{ML}), pc/mi/ln	27.8
Speed 2 (S_3), mi/h	15.4	Level of Service (LOS)	D

HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	4/24/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Cumulative Plus Project Conditions
Project Description	BioMarin - US 101 Mission Ave Slip Off-Ramp		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	3	1
Free-Flow Speed (FFS), mi/h	60.0	50.0
Segment Length (L) / Deceleration Length (L _D), ft	1500	170
Terrain Type	Specific Grade	Specific Grade
Percent Grade, %	-2.44	-1.80
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Volume (V _i), veh/h	5449	2080
Peak Hour Factor (PHF)	0.97	0.96
Total Trucks, %	4.40	2.00
Single-Unit Trucks (SUT), %	66	66
Tractor-Trailers (TT), %	34	34
Heavy Vehicle Adjustment Factor (f _{HV})	0.951	0.973
Flow Rate (v _i), pc/h	5907	2227
Capacity (c), pc/h	6900	2100
Volume-to-Capacity Ratio (v/c)	0.86	1.06

Speed and Density

Upstream Equilibrium Distance (L _{EQ}), ft	150865.8	Density in Ramp Influence Area (D _R), pc/mi/ln	-
Distance to Upstream Ramp (L _{UP}), ft	10000	Speed Index (D _S)	-
Downstream Equilibrium Distance (L _{EQ}), ft	-	Flow Outer Lanes (v _{OA}), pc/h/ln	1803
Distance to Downstream Ramp (L _{DOWN}), ft	10000	Off-Ramp Influence Area Speed (S _R), mi/h	-
Prop. Freeway Vehicles in Lane 1 and 2 (P _{FD})	0.510	Outer Lanes Freeway Speed (S _O), mi/h	62.7
Flow in Lanes 1 and 2 (v ₁₂), pc/h	4104	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (v _{R12}), pc/h	-	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Specific Grade
Managed Lane Length, ft	5280	Percent Grade, %	-2.44
Managed Lane Adjustment Factors			
Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000
Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		
Managed Lane Demand and Capacity			
Volume (V _{ML}), veh/h	1380	Heavy Vehicle Adjustment Factor (f _{HV})	0.973
Peak Hour Factor	0.91	Flow Rate (V _{p,ML}), pc/h/ln	1559
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	66	Adjusted Capacity (C _{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	34	Volume-to-Capacity Ratio (v/c)	0.94
Passenger Car Equivalent (E _T)	2.390		
Managed Lane Speed and Density			
Breakpoint (BP _{ML})	501	Indicator Variable	1
Speed 1 (S ₁), mi/h	60.0	Average Speed (S _{ML}), mi/h	40.4
Speed 2 (S ₂), mi/h	4.1	Density (D _{ML}), pc/mi/ln	38.6
Speed 2 (S ₃), mi/h	15.5	Level of Service (LOS)	E

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	3/16/2018
Agency		Analysis Year	2018
Jurisdiction	San Rafael, Caltrans District 4	Time Period Analyzed	PM Peak Hour, Cumulative Plus Project Conditions
Project Description	BioMarin - US 101 SB Mission Avenue to Second Street		

General Purpose Geometric Data

Number of General Purpose Lanes, In	3	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	60.0
Right-Side Lateral Clearance, ft	-		

General Purpose Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

General Purpose Demand and Capacity

Volume (V), veh/h	3369	Heavy Vehicle Adjustment Factor (f _{HV})	0.919
Peak Hour Factor (PHF)	0.97	Flow Rate (v _{p,GP}), pc/h/ln	1260
Total Trucks, %	4.40	Capacity (c), pc/h/ln	2300
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c _{adj}), pc/h/ln	2300
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.55
Passenger Car Equivalent (E _T)	3.000		

General Purpose Speed and Density

Lane Width Adjustment (f _{LW})	-	Average Speed (S), mi/h	60.0
Right-Side Lateral Clearance Adj. (f _{RLC})	-	Density (D _{GP}), pc/mi/ln	21.0
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS _{adj}), mi/h	60.0		

Managed Lane Geometric Data

Managed Lane Type	Continuous Access	Free-Flow Speed (FFS), mi/h	60.0
Number of Managed Lanes, In	1	Terrain Type	Rolling
Managed Lane Length, ft	5280	Percent Grade, %	-

Managed Lane Adjustment Factors

Driver Population	All Familiar	Driver Population CAF	1.000
Weather Type	Non-Severe Weather	Weather Type CAF	1.000
Driver Population SAF	1.000	Final Speed Adjustment Factor (SAF)	1.000

Weather Type SAF	1.000	Final Capacity Adjustment Factor (CAF)	1.000
Demand Adjustment Factor (DAF)	1.000		

Managed Lane Demand and Capacity

Volume (V_{ML}), veh/h	918	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor	0.91	Flow Rate ($V_{p,ML}$), pc/h/ln	1049
Total Trucks, %	2.00	Capacity (c), pc/h/ln	1650
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (C_{adj}), pc/h/ln	1650
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.64
Passenger Car Equivalent (E_T)	3.000		

Managed Lane Speed and Density

Breakpoint (BP_{ML})	501	Indicator Variable	0
Speed 1 (S_1), mi/h	60.0	Average Speed (S_{ML}), mi/h	59.2
Speed 2 (S_2), mi/h	0.8	Density (D_{ML}), pc/mi/ln	17.7
Speed 2 (S_3), mi/h	4.2	Level of Service (LOS)	B

Leisch Method for Weaving Analysis

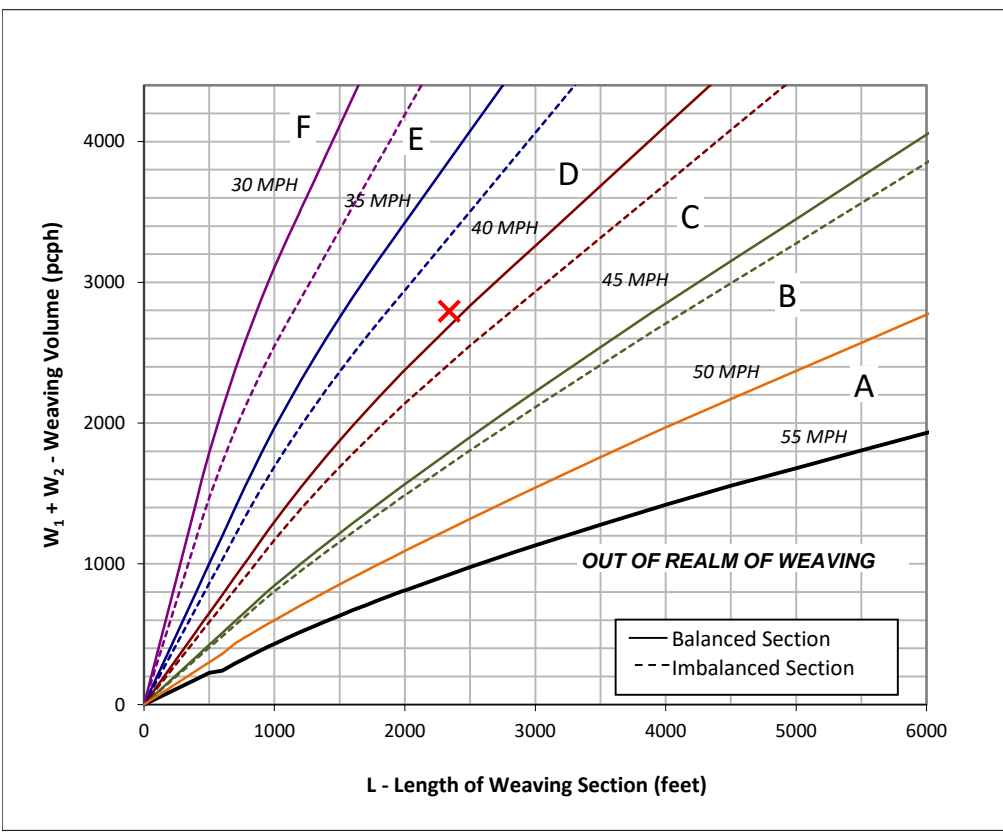
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	2,340

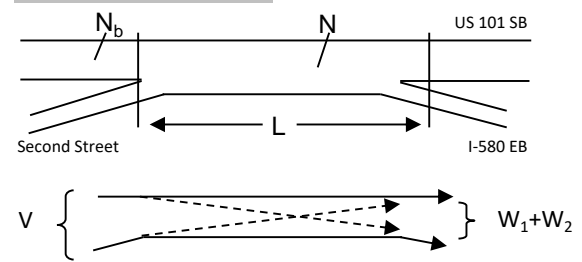
Project Information

Project	BioMarin
Scenario	Cumulative Plus Project PM Peak Hour
Freeway	US 101 SB
On-ramp	Second Street
Off-ramp	I-580 EB

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	5,441	Volume (vph)*	1,185	Volume (vph)*	1,442
Truck Percentage	4%	Truck Percentage	3%	Truck Percentage	3%
PCE for Trucks	2.0	PCE for Trucks	2.0	PCE for Trucks	4.1
Volume (pcph)	5,680	Volume (pcph)	1,215	Volume (pcph)	1,582



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
35 MPH and 40 MPH
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 39.6
- Weaving Intensity Factor (k) 2.55
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,890
- Level of Service (LOS) E

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014