

Appendix K-2

Traffic LOS Analysis for Caribbean Bridge Replacement



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	11	68	36	4	487	1493	37	1	142	8
v/c Ratio	0.04	0.23	0.12	0.02	0.68	0.41	0.03	0.01	0.15	0.03
Control Delay	22.7	10.0	22.6	16.5	25.1	7.2	5.4	26.0	17.6	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	10.0	22.6	16.5	25.1	7.2	5.4	26.0	17.6	11.9
Queue Length 50th (ft)	2	0	7	0	87	42	1	0	10	0
Queue Length 95th (ft)	17	31	37	8	#392	212	18	5	29	9
Internal Link Dist (ft)	694		279			755			340	
Turn Bay Length (ft)					750		100	200		100
Base Capacity (vph)	719	666	739	629	711	3576	1096	178	2043	613
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.10	0.05	0.01	0.68	0.42	0.03	0.01	0.07	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Sunnyvale East Bridge Construction
Existing AM

1: Moffett Park Dr & Caribbean Dr
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	2	63	8	25	4	448	1374	34	1	131	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frbp, ped/bikes		1.00	0.98		1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1790	1558		1840	1561	1770	5085	1549	1770	5085	1527
Flt Permitted		0.96	1.00		0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1790	1558		1840	1561	1770	5085	1549	1770	5085	1527
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)	9	2	68	9	27	4	487	1493	37	1	142	8
RTOR Reduction (vph)	0	0	64	0	0	4	0	0	10	0	0	6
Lane Group Flow (vph)	0	11	4	0	36	0	487	1493	27	1	142	2
Confl. Peds. (#/hr)			4			2			1			10
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)		3.4	3.4		2.3	2.3	17.6	29.3	29.3	0.5	12.2	12.2
Effective Green, g (s)		3.4	3.4		2.3	2.3	17.6	29.3	29.3	0.5	12.2	12.2
Actuated g/C Ratio		0.07	0.07		0.04	0.04	0.34	0.57	0.57	0.01	0.24	0.24
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		118	103		82	70	605	2893	881	17	1205	362
v/s Ratio Prot		c0.01			c0.02		c0.28	c0.29		0.00	0.03	
v/s Ratio Perm			0.00			0.00			0.02			0.00
v/c Ratio		0.09	0.04		0.44	0.00	0.80	0.52	0.03	0.06	0.12	0.01
Uniform Delay, d1		22.6	22.5		24.0	23.5	15.4	6.8	4.9	25.3	15.4	15.0
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.3	0.2		3.7	0.0	7.7	0.2	0.0	1.5	0.0	0.0
Delay (s)		22.9	22.7		27.7	23.5	23.1	6.9	4.9	26.7	15.5	15.0
Level of Service		C	C		C	C	C	A	A	C	B	B
Approach Delay (s)		22.7			27.3			10.8			15.5	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	11.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	51.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	7	22	65	1441	129	7
v/c Ratio	0.02	0.02	0.31	0.79	0.08	0.01
Control Delay	11.8	0.1	24.4	18.2	12.1	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	0.1	24.4	18.2	12.1	7.8
Queue Length 50th (ft)	1	0	18	132	9	0
Queue Length 95th (ft)	8	0	46	180	19	7
Internal Link Dist (ft)		360		307	2155	
Turn Bay Length (ft)	25		150			175
Base Capacity (vph)	451	1010	212	1831	1627	511
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.02	0.31	0.79	0.08	0.01

Intersection Summary

Sunnyvale East Bridge Construction
Existing AM

2: Caribbean Dr &
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	0	20	0	0	0	60	1326	0	0	119	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0					4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	1.00					1.00	0.91			0.91	1.00
Frt	1.00	0.85					1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770	1583					1770	5085			5085	1583
Flt Permitted	0.76	1.00					0.95	1.00			1.00	1.00
Satd. Flow (perm)	1410	1583					1770	5085			5085	1583
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)	7	0	22	0	0	0	65	1441	0	0	129	7
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	0	5
Lane Group Flow (vph)	7	7	0	0	0	0	65	1441	0	0	129	2
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	16.0	16.0					6.0	18.0			16.0	16.0
Effective Green, g (s)	16.0	16.0					6.0	18.0			16.0	16.0
Actuated g/C Ratio	0.32	0.32					0.12	0.36			0.32	0.32
Clearance Time (s)	4.0	4.0					4.0	4.0			4.0	4.0
Lane Grp Cap (vph)	451	507					212	1831			1627	507
v/s Ratio Prot		0.00					c0.04	c0.28			0.03	
v/s Ratio Perm	c0.00											0.00
v/c Ratio	0.02	0.01					0.31	0.79			0.08	0.00
Uniform Delay, d1	11.6	11.6					20.1	14.3			11.9	11.6
Progression Factor	1.00	1.00					1.00	1.00			1.00	1.00
Incremental Delay, d2	0.1	0.0					3.7	3.5			0.1	0.0
Delay (s)	11.7	11.7					23.8	17.8			12.0	11.6
Level of Service	B	B					C	B			B	B
Approach Delay (s)		11.7			0.0			18.1			11.9	
Approach LOS		B			A			B			B	

Intersection Summary

HCM Average Control Delay	17.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	4	140	516	932	21	32
v/c Ratio	0.02	0.16	0.60	0.43	0.09	0.13
Control Delay	22.0	13.2	20.3	9.8	19.9	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	13.2	20.3	9.8	19.9	10.2
Queue Length 50th (ft)	1	8	60	50	5	0
Queue Length 95th (ft)	9	20	#140	108	22	19
Internal Link Dist (ft)		893		2155		
Turn Bay Length (ft)	150		300			
Base Capacity (vph)	162	1809	866	2683	650	601
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.08	0.60	0.35	0.03	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Sunnyvale East Bridge Construction
Existing AM

3: Caribbean Dr & Crossman Ave
HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑↑		↗↗	↑↑↑		↗		↗		↕	
Volume (vph)	4	96	33	475	857	0	19	0	29	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0		4.0			
Lane Util. Factor	1.00	0.91		0.97	0.91		1.00		1.00			
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00		1.00			
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		1.00			
Frt	1.00	0.96		1.00	1.00		1.00		0.85			
Flt Protected	0.95	1.00		0.95	1.00		0.95		1.00			
Satd. Flow (prot)	1770	4870		3433	5085		1770		1583			
Flt Permitted	0.95	1.00		0.95	1.00		0.95		1.00			
Satd. Flow (perm)	1770	4870		3433	5085		1770		1583			
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)	4	104	36	516	932	0	21	0	32	0	0	0
RTOR Reduction (vph)	0	30	0	0	0	0	0	0	28	0	0	0
Lane Group Flow (vph)	4	110	0	516	932	0	21	0	4	0	0	0
Confl. Peds. (#/hr)			4									
Turn Type	Prot			Prot			Prot		custom		Split	
Protected Phases	7	4		3	8		2				6	6
Permitted Phases									2			
Actuated Green, G (s)	0.7	8.6		11.3	19.2		6.2		6.2			
Effective Green, g (s)	0.7	8.6		11.3	19.2		6.2		6.2			
Actuated g/C Ratio	0.01	0.18		0.24	0.40		0.13		0.13			
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0		4.0			
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0		3.0			
Lane Grp Cap (vph)	26	878		813	2047		230		206			
v/s Ratio Prot	0.00	0.02		c0.15	c0.18		c0.01					
v/s Ratio Perm									0.00			
v/c Ratio	0.15	0.13		0.63	0.46		0.09		0.02			
Uniform Delay, d1	23.2	16.4		16.3	10.4		18.3		18.1			
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00			
Incremental Delay, d2	2.7	0.1		1.6	0.2		0.2		0.0			
Delay (s)	26.0	16.5		18.0	10.6		18.4		18.1			
Level of Service	C	B		B	B		B		B			
Approach Delay (s)		16.7			13.2			18.3			0.0	
Approach LOS		B			B			B			A	

Intersection Summary

HCM Average Control Delay	13.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	47.7	Sum of lost time (s)	17.6
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

























Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	12	538	18	2	365	346	8	3	1572	13
v/c Ratio	0.05	0.81	0.11	0.01	0.86	0.10	0.01	0.03	0.79	0.02
Control Delay	27.1	13.6	33.6	25.0	49.8	6.4	6.0	36.0	24.3	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	13.6	33.6	25.0	49.8	6.4	6.0	36.0	24.3	14.0
Queue Length 50th (ft)	4	2	6	0	125	8	0	1	168	1
Queue Length 95th (ft)	19	98	28	6	#371	52	7	10	#393	15
Internal Link Dist (ft)	694		279			755			340	
Turn Bay Length (ft)					750		100	200		100
Base Capacity (vph)	427	778	428	374	425	3409	1040	106	1984	599
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.69	0.04	0.01	0.86	0.10	0.01	0.03	0.79	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Sunnyvale East Bridge Construction
Existing PM

1: Moffett Park Dr & Caribbean Dr
HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	1	495	15	2	2	336	318	7	3	1446	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frbp, ped/bikes		1.00	0.99		1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1781	1562		1783	1556	1770	5085	1548	1770	5085	1530
Flt Permitted		0.96	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1781	1562		1783	1556	1770	5085	1548	1770	5085	1530
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1	538	16	2	2	365	346	8	3	1572	13
RTOR Reduction (vph)	0	0	466	0	0	2	0	0	3	0	0	4
Lane Group Flow (vph)	0	12	72	0	18	0	365	346	5	3	1572	9
Confl. Peds. (#/hr)			1			4			1			6
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)		9.1	9.1		2.5	2.5	16.3	45.6	45.6	0.7	30.0	30.0
Effective Green, g (s)		9.1	9.1		2.5	2.5	16.3	45.6	45.6	0.7	30.0	30.0
Actuated g/C Ratio		0.12	0.12		0.03	0.03	0.22	0.62	0.62	0.01	0.41	0.41
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		219	192		60	53	390	3138	955	17	2064	621
v/s Ratio Prot		0.01			c0.01		c0.21	0.07		0.00	c0.31	
v/s Ratio Perm			c0.05			0.00			0.00			0.01
v/c Ratio		0.05	0.38		0.30	0.00	0.94	0.11	0.01	0.18	0.76	0.02
Uniform Delay, d1		28.6	29.8		34.8	34.5	28.3	5.8	5.4	36.3	18.9	13.1
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.1	1.2		2.8	0.0	29.6	0.0	0.0	4.9	1.7	0.0
Delay (s)		28.7	31.0		37.6	34.5	57.8	5.8	5.4	41.2	20.6	13.1
Level of Service		C	C		D	C	E	A	A	D	C	B
Approach Delay (s)		31.0			37.3			32.2			20.6	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM Average Control Delay			25.6				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			73.9				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			73.3%				ICU Level of Service			D		
Analysis Period (min)			15									

c Critical Lane Group



Lane Group	EBL	EBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	7	128	150	209	1460	9
v/c Ratio	0.02	0.22	0.67	0.10	0.79	0.02
Control Delay	14.2	2.2	40.4	9.9	19.5	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	2.2	40.4	9.9	19.5	7.1
Queue Length 50th (ft)	2	0	48	14	150	0
Queue Length 95th (ft)	9	16	#120	25	200	7
Internal Link Dist (ft)		360		307	2155	
Turn Bay Length (ft)	25		150			175
Base Capacity (vph)	410	592	225	2126	1849	581
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.22	0.67	0.10	0.79	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Sunnyvale East Bridge Construction
Existing PM

2: Caribbean Dr &
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	0	118	0	0	0	138	192	0	0	1343	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0					4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	1.00					1.00	0.91			0.91	1.00
Frt	1.00	0.85					1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770	1583					1770	5085			5085	1583
Flt Permitted	0.76	1.00					0.95	1.00			1.00	1.00
Satd. Flow (perm)	1410	1583					1770	5085			5085	1583
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)	7	0	128	0	0	0	150	209	0	0	1460	9
RTOR Reduction (vph)	0	91	0	0	0	0	0	0	0	0	0	6
Lane Group Flow (vph)	7	37	0	0	0	0	150	209	0	0	1460	3
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	16.0	16.0					7.0	23.0			20.0	20.0
Effective Green, g (s)	16.0	16.0					7.0	23.0			20.0	20.0
Actuated g/C Ratio	0.29	0.29					0.13	0.42			0.36	0.36
Clearance Time (s)	4.0	4.0					4.0	4.0			4.0	4.0
Lane Grp Cap (vph)	410	461					225	2126			1849	576
v/s Ratio Prot		c0.02					c0.08	c0.04			c0.29	
v/s Ratio Perm	0.00											0.00
v/c Ratio	0.02	0.08					0.67	0.10			0.79	0.01
Uniform Delay, d1	13.9	14.2					22.9	9.7			15.6	11.2
Progression Factor	1.00	1.00					1.00	1.00			1.00	1.00
Incremental Delay, d2	0.1	0.3					14.6	0.1			3.5	0.0
Delay (s)	14.0	14.5					37.5	9.8			19.1	11.2
Level of Service	B	B					D	A			B	B
Approach Delay (s)		14.5			0.0			21.4			19.1	
Approach LOS		B			A			C			B	

Intersection Summary

HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	2	1088	107	109	7	425
v/c Ratio	0.01	0.63	0.37	0.05	0.02	0.69
Control Delay	23.5	16.1	27.0	9.6	17.2	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	16.1	27.0	9.6	17.2	9.2
Queue Length 50th (ft)	1	87	14	4	2	0
Queue Length 95th (ft)	6	160	39	19	10	58
Internal Link Dist (ft)		893		2155		
Turn Bay Length (ft)	150		300			
Base Capacity (vph)	151	1838	293	2342	642	845
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.59	0.37	0.05	0.01	0.50
Intersection Summary						

Sunnyvale East Bridge Construction
Existing PM

3: Caribbean Dr & Crossman Ave
HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕↕↗		↖↖	↕↕↗		↖		↗		↕↗	
Volume (vph)	2	960	41	98	100	0	6	0	391	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0		4.0			
Lane Util. Factor	1.00	0.91		0.97	0.91		1.00		1.00			
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00		1.00			
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		1.00			
Frt	1.00	0.99		1.00	1.00		1.00		0.85			
Flt Protected	0.95	1.00		0.95	1.00		0.95		1.00			
Satd. Flow (prot)	1770	5051		3433	5085		1770		1583			
Flt Permitted	0.95	1.00		0.95	1.00		0.95		1.00			
Satd. Flow (perm)	1770	5051		3433	5085		1770		1583			
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)	2	1043	45	107	109	0	7	0	425	0	0	0
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	361	0	0	0
Lane Group Flow (vph)	2	1082	0	107	109	0	7	0	64	0	0	0
Confl. Peds. (#/hr)			2									
Turn Type	Prot			Prot			Prot		custom	Split		
Protected Phases	7	4		3	8		2			6	6	
Permitted Phases									2			
Actuated Green, G (s)	0.7	18.7		3.0	21.0		7.7		7.7			
Effective Green, g (s)	0.7	18.7		3.0	21.0		7.7		7.7			
Actuated g/C Ratio	0.01	0.37		0.06	0.41		0.15		0.15			
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0		4.0			
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0		3.0			
Lane Grp Cap (vph)	24	1852		202	2094		267		239			
v/s Ratio Prot	0.00	c0.21		c0.03	0.02		0.00					
v/s Ratio Perm									c0.04			
v/c Ratio	0.08	0.58		0.53	0.05		0.03		0.27			
Uniform Delay, d1	24.8	13.0		23.3	9.0		18.5		19.2			
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00			
Incremental Delay, d2	1.5	0.5		2.5	0.0		0.0		0.6			
Delay (s)	26.3	13.5		25.8	9.0		18.5		19.8			
Level of Service	C	B		C	A		B		B			
Approach Delay (s)		13.5			17.3			19.7			0.0	
Approach LOS		B			B			B			A	

Intersection Summary

HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	51.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

























Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	11	68	36	4	487	1493	37	1	142	8
v/c Ratio	0.04	0.23	0.12	0.02	0.68	0.41	0.03	0.01	0.15	0.03
Control Delay	22.7	10.0	22.6	16.5	25.1	7.2	5.4	26.0	17.6	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	10.0	22.6	16.5	25.1	7.2	5.4	26.0	17.6	11.9
Queue Length 50th (ft)	2	0	7	0	87	42	1	0	10	0
Queue Length 95th (ft)	17	31	37	8	#392	212	18	5	29	9
Internal Link Dist (ft)	694		279			755			340	
Turn Bay Length (ft)					750		100	200		100
Base Capacity (vph)	719	666	739	629	711	3576	1096	178	2043	613
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.10	0.05	0.01	0.68	0.42	0.03	0.01	0.07	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Sunnyvale East Bridge Construction
Existing AM with Construction

1: Moffett Park Dr & Caribbean Dr
HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	2	63	8	25	4	448	1374	34	1	131	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frbp, ped/bikes		1.00	0.98		1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1790	1558		1840	1561	1770	5085	1549	1770	5085	1527
Flt Permitted		0.96	1.00		0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1790	1558		1840	1561	1770	5085	1549	1770	5085	1527
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)	9	2	68	9	27	4	487	1493	37	1	142	8
RTOR Reduction (vph)	0	0	64	0	0	4	0	0	10	0	0	6
Lane Group Flow (vph)	0	11	4	0	36	0	487	1493	27	1	142	2
Confl. Peds. (#/hr)			4			2			1			10
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)		3.4	3.4		2.3	2.3	17.6	29.3	29.3	0.5	12.2	12.2
Effective Green, g (s)		3.4	3.4		2.3	2.3	17.6	29.3	29.3	0.5	12.2	12.2
Actuated g/C Ratio		0.07	0.07		0.04	0.04	0.34	0.57	0.57	0.01	0.24	0.24
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		118	103		82	70	605	2893	881	17	1205	362
v/s Ratio Prot		c0.01			c0.02		c0.28	c0.29		0.00	0.03	
v/s Ratio Perm			0.00			0.00			0.02			0.00
v/c Ratio		0.09	0.04		0.44	0.00	0.80	0.52	0.03	0.06	0.12	0.01
Uniform Delay, d1		22.6	22.5		24.0	23.5	15.4	6.8	4.9	25.3	15.4	15.0
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.3	0.2		3.7	0.0	7.7	0.2	0.0	1.5	0.0	0.0
Delay (s)		22.9	22.7		27.7	23.5	23.1	6.9	4.9	26.7	15.5	15.0
Level of Service		C	C		C	C	C	A	A	C	B	B
Approach Delay (s)		22.7			27.3			10.8			15.5	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	11.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	51.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group
























Lane Group	EBL	EBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	7	22	65	1441	129	7
v/c Ratio	0.02	0.02	0.09	0.98	0.17	0.02
Control Delay	23.7	0.1	13.9	43.7	24.8	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	0.1	13.9	43.7	24.8	14.5
Queue Length 50th (ft)	3	0	18	337	25	0
Queue Length 95th (ft)	13	0	41	#496	47	10
Internal Link Dist (ft)		360		307	2155	
Turn Bay Length (ft)	25		150			175
Base Capacity (vph)	301	1038	732	1463	755	343
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.02	0.09	0.98	0.17	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Sunnyvale East Bridge Construction
Existing AM with Construction

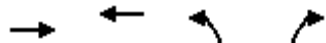
2: Caribbean Dr &
HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	0	20	0	0	0	60	1326	0	0	119	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0					4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	1.00
Frt	1.00	0.85					1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770	1583					1770	3539			3539	1583
Flt Permitted	0.76	1.00					0.95	1.00			1.00	1.00
Satd. Flow (perm)	1410	1583					1770	3539			3539	1583
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)	7	0	22	0	0	0	65	1441	0	0	129	7
RTOR Reduction (vph)	0	17	0	0	0	0	0	0	0	0	0	6
Lane Group Flow (vph)	7	5	0	0	0	0	65	1441	0	0	129	1
Turn Type	Perm			Perm			Split		Perm	Split		Perm
Protected Phases		4			8		2	2		6	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	16.0	16.0					31.0	31.0			16.0	16.0
Effective Green, g (s)	16.0	16.0					31.0	31.0			16.0	16.0
Actuated g/C Ratio	0.21	0.21					0.41	0.41			0.21	0.21
Clearance Time (s)	4.0	4.0					4.0	4.0			4.0	4.0
Lane Grp Cap (vph)	301	338					732	1463			755	338
v/s Ratio Prot		0.00					0.04	c0.41			c0.04	
v/s Ratio Perm	c0.00											0.00
v/c Ratio	0.02	0.01					0.09	0.98			0.17	0.00
Uniform Delay, d1	23.3	23.3					13.4	21.8			24.1	23.2
Progression Factor	1.00	1.00					1.00	1.00			1.00	1.00
Incremental Delay, d2	0.1	0.1					0.2	20.2			0.5	0.0
Delay (s)	23.5	23.4					13.6	42.0			24.6	23.3
Level of Service	C	C					B	D			C	C
Approach Delay (s)		23.4			0.0			40.8			24.5	
Approach LOS		C			A			D			C	

Intersection Summary

HCM Average Control Delay	39.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	144	1448	21	32
v/c Ratio	0.36	0.83	0.13	0.19
Control Delay	25.0	21.1	32.5	14.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.0	21.1	32.5	14.7
Queue Length 50th (ft)	23	267	9	0
Queue Length 95th (ft)	50	#412	29	24
Internal Link Dist (ft)	893	2155		
Turn Bay Length (ft)				
Base Capacity (vph)	782	1747	395	378
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.18	0.83	0.05	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Sunnyvale East Bridge Construction
Existing AM with Construction

3: Caribbean Dr & Crossman Ave
HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗		↗		↕↕	
Volume (vph)	4	96	33	475	857	0	19	0	29	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0		4.0			
Lane Util. Factor		0.95			0.95		1.00		1.00			
Frbp, ped/bikes		0.99			1.00		1.00		1.00			
Flpb, ped/bikes		1.00			1.00		1.00		1.00			
Frt		0.96			1.00		1.00		0.85			
Flt Protected		1.00			0.98		0.95		1.00			
Satd. Flow (prot)		3377			3477		1770		1583			
Flt Permitted		1.00			0.98		0.95		1.00			
Satd. Flow (perm)		3377			3477		1770		1583			
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)	4	104	36	516	932	0	21	0	32	0	0	0
RTOR Reduction (vph)	0	32	0	0	0	0	0	0	29	0	0	0
Lane Group Flow (vph)	0	112	0	0	1448	0	21	0	3	0	0	0
Confl. Peds. (#/hr)			4									
Turn Type	Split			Split			Prot		custom		Split	
Protected Phases	4	4		8	8		2		2		6	6
Permitted Phases												
Actuated Green, G (s)		7.7			36.0		6.4		6.4			
Effective Green, g (s)		7.7			36.0		6.4		6.4			
Actuated g/C Ratio		0.11			0.50		0.09		0.09			
Clearance Time (s)		4.0			4.0		4.0		4.0			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		363			1748		158		141			
v/s Ratio Prot		c0.03			c0.42		c0.01		0.00			
v/s Ratio Perm												
v/c Ratio		0.31			0.83		0.13		0.02			
Uniform Delay, d1		29.5			15.2		30.0		29.7			
Progression Factor		1.00			1.00		1.00		1.00			
Incremental Delay, d2		0.5			3.4		0.4		0.1			
Delay (s)		30.0			18.6		30.4		29.8			
Level of Service		C			B		C		C			
Approach Delay (s)		30.0			18.6		30.0		0.0			
Approach LOS		C			B		C		A			

Intersection Summary

HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	71.6	Sum of lost time (s)	21.5
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	12	538	18	2	365	346	8	3	1572	13
v/c Ratio	0.05	0.81	0.11	0.01	0.86	0.15	0.01	0.03	0.79	0.02
Control Delay	27.1	13.6	33.6	25.0	49.8	6.8	6.0	36.0	24.3	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	13.6	33.6	25.0	49.8	6.8	6.0	36.0	24.3	14.0
Queue Length 50th (ft)	4	2	6	0	125	12	0	1	168	1
Queue Length 95th (ft)	19	98	28	6	#371	78	7	10	#393	15
Internal Link Dist (ft)	694		279			755			340	
Turn Bay Length (ft)					750		100	200		100
Base Capacity (vph)	427	778	428	374	425	2373	1040	106	1984	599
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.69	0.04	0.01	0.86	0.15	0.01	0.03	0.79	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Sunnyvale East Bridge Construction
Existing PM with Construction

1: Moffett Park Dr & Caribbean Dr
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	1	495	15	2	2	336	318	7	3	1446	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00
Frbp, ped/bikes		1.00	0.99		1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1781	1562		1783	1556	1770	3539	1548	1770	5085	1530
Flt Permitted		0.96	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1781	1562		1783	1556	1770	3539	1548	1770	5085	1530
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1	538	16	2	2	365	346	8	3	1572	13
RTOR Reduction (vph)	0	0	466	0	0	2	0	0	3	0	0	4
Lane Group Flow (vph)	0	12	72	0	18	0	365	346	5	3	1572	9
Confl. Peds. (#/hr)			1			4			1			6
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)		9.1	9.1		2.5	2.5	16.3	45.6	45.6	0.7	30.0	30.0
Effective Green, g (s)		9.1	9.1		2.5	2.5	16.3	45.6	45.6	0.7	30.0	30.0
Actuated g/C Ratio		0.12	0.12		0.03	0.03	0.22	0.62	0.62	0.01	0.41	0.41
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		219	192		60	53	390	2184	955	17	2064	621
v/s Ratio Prot		0.01			c0.01		c0.21	0.10		0.00	c0.31	
v/s Ratio Perm			c0.05			0.00			0.00			0.01
v/c Ratio		0.05	0.38		0.30	0.00	0.94	0.16	0.01	0.18	0.76	0.02
Uniform Delay, d1		28.6	29.8		34.8	34.5	28.3	6.0	5.4	36.3	18.9	13.1
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.1	1.2		2.8	0.0	29.6	0.0	0.0	4.9	1.7	0.0
Delay (s)		28.7	31.0		37.6	34.5	57.8	6.0	5.4	41.2	20.6	13.1
Level of Service		C	C		D	C	E	A	A	D	C	B
Approach Delay (s)		31.0			37.3			32.3			20.6	
Approach LOS		C			D			C			C	

Intersection Summary

HCM Average Control Delay	25.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	73.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group
























Lane Group	EBL	EBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	7	128	150	209	1460	9
v/c Ratio	0.02	0.20	0.40	0.28	1.00	0.01
Control Delay	23.7	0.7	29.1	25.9	46.8	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	0.7	29.1	25.9	46.8	8.2
Queue Length 50th (ft)	3	0	60	43	345	0
Queue Length 95th (ft)	13	0	113	72	#506	8
Internal Link Dist (ft)		360		307	2155	
Turn Bay Length (ft)	25		150			175
Base Capacity (vph)	301	634	378	755	1463	659
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.20	0.40	0.28	1.00	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Sunnyvale East Bridge Construction
Existing PM with Construction

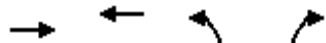
2: Caribbean Dr &
HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	0	118	0	0	0	138	192	0	0	1343	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0					4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	1.00
Frt	1.00	0.85					1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770	1583					1770	3539			3539	1583
Flt Permitted	0.76	1.00					0.95	1.00			1.00	1.00
Satd. Flow (perm)	1410	1583					1770	3539			3539	1583
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)	7	0	128	0	0	0	150	209	0	0	1460	9
RTOR Reduction (vph)	0	101	0	0	0	0	0	0	0	0	0	5
Lane Group Flow (vph)	7	27	0	0	0	0	150	209	0	0	1460	4
Turn Type	Perm			Perm			Split		Perm	Split		Perm
Protected Phases		4			8		2	2		6	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	16.0	16.0					16.0	16.0			31.0	31.0
Effective Green, g (s)	16.0	16.0					16.0	16.0			31.0	31.0
Actuated g/C Ratio	0.21	0.21					0.21	0.21			0.41	0.41
Clearance Time (s)	4.0	4.0					4.0	4.0			4.0	4.0
Lane Grp Cap (vph)	301	338					378	755			1463	654
v/s Ratio Prot		c0.02					c0.08	0.06			c0.41	
v/s Ratio Perm	0.00											0.00
v/c Ratio	0.02	0.08					0.40	0.28			1.00	0.01
Uniform Delay, d1	23.3	23.6					25.4	24.7			22.0	12.9
Progression Factor	1.00	1.00					1.00	1.00			1.00	1.00
Incremental Delay, d2	0.1	0.5					3.1	0.9			23.0	0.0
Delay (s)	23.5	24.1					28.5	25.6			45.0	13.0
Level of Service	C	C					C	C			D	B
Approach Delay (s)		24.0			0.0			26.8			44.8	
Approach LOS		C			A			C			D	

Intersection Summary

HCM Average Control Delay	40.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1090	216	7	425
v/c Ratio	0.79	0.71	0.03	0.72
Control Delay	21.9	41.4	20.0	10.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.9	41.4	20.0	10.6
Queue Length 50th (ft)	150	36	2	0
Queue Length 95th (ft)	#322	#96	11	63
Internal Link Dist (ft)	893	2155		
Turn Bay Length (ft)				
Base Capacity (vph)	1374	306	502	753
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.79	0.71	0.01	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Sunnyvale East Bridge Construction
Existing PM with Construction

3: Caribbean Dr & Crossman Ave
HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗		↗		↕↕	
Volume (vph)	2	960	41	98	100	0	6	0	391	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0		4.0			
Lane Util. Factor		0.95			0.95		1.00		1.00			
Frbp, ped/bikes		1.00			1.00		1.00		1.00			
Flpb, ped/bikes		1.00			1.00		1.00		1.00			
Frt		0.99			1.00		1.00		0.85			
Flt Protected		1.00			0.98		0.95		1.00			
Satd. Flow (prot)		3514			3454		1770		1583			
Flt Permitted		1.00			0.98		0.95		1.00			
Satd. Flow (perm)		3514			3454		1770		1583			
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)	2	1043	45	107	109	0	7	0	425	0	0	0
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	366	0	0	0
Lane Group Flow (vph)	0	1086	0	0	216	0	7	0	59	0	0	0
Confl. Peds. (#/hr)			2									
Turn Type	Split			Split			Prot		custom		Split	
Protected Phases	4	4		8	8		2		2		6	6
Permitted Phases												
Actuated Green, G (s)		22.1			5.0		7.9		7.9			
Effective Green, g (s)		22.1			5.0		7.9		7.9			
Actuated g/C Ratio		0.39			0.09		0.14		0.14			
Clearance Time (s)		4.0			4.0		4.0		4.0			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		1375			306		247		221			
v/s Ratio Prot		c0.31			c0.06		0.00		c0.04			
v/s Ratio Perm												
v/c Ratio		0.79			0.71		0.03		0.27			
Uniform Delay, d1		15.2			25.0		21.0		21.7			
Progression Factor		1.00			1.00		1.00		1.00			
Incremental Delay, d2		3.2			7.2		0.0		0.7			
Delay (s)		18.3			32.3		21.0		22.4			
Level of Service		B			C		C		C			
Approach Delay (s)		18.3			32.3			22.4			0.0	
Approach LOS		B			C			C			A	

Intersection Summary

HCM Average Control Delay	21.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	56.5	Sum of lost time (s)	21.5
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group