APPENDIX N

2020 & 2040 Build 2 Synchro Intersection Analysis

Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	277	2065	321	1386	495	98	147	196	22	22	22
v/c Ratio	0.89	0.66	0.84	0.49	0.44	0.28	0.77	0.37	0.31	0.30	0.06
Control Delay	100.8	23.4	97.7	18.7	4.3	75.1	102.7	7.8	94.0	93.2	0.3
Queue Delay	0.0	0.0	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	100.8	23.4	97.7	19.0	4.5	75.1	102.7	7.8	94.0	93.2	0.3
Queue Length 50th (ft)	319	541	198	260	44	56	172	0	27	27	0
Queue Length 95th (ft)	#468	685	#269	447	138	85	247	66	63	63	0
Internal Link Dist (ft)		580		548			436			396	
Turn Bay Length (ft)	450		375		350	225		250	200		
Base Capacity (vph)	335	3144	392	2853	1253	610	331	528	252	259	390
Starvation Cap Reductn	0	0	0	730	211	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.66	0.82	0.65	0.48	0.16	0.44	0.37	0.09	0.08	0.06

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

1: SW 12th Avenue & Hillsboro Bvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	255	1735	165	295	1275	455	90	135	180	30	10	20
Future Volume (vph)	255	1735	165	295	1275	455	90	135	180	30	10	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.0	6.0	6.0	6.5	6.0	6.0	6.5
Lane Util. Factor	1.00	0.91		0.97	0.91	1.00	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00
Satd. Flow (prot)	1770	5019		3433	5085	1583	3433	1863	1583	1681	1726	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00
Satd. Flow (perm)	1770	5019		3433	5085	1583	3433	1863	1583	1681	1726	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)	277	1886	179	321	1386	495	98	147	196	33	11	22
RTOR Reduction (vph)	0	4	0	0	0	107	0	0	156	0	0	17
Lane Group Flow (vph)	277	2061	0	321	1386	388	98	147	40	22	22	5
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	1	6		5	2	3	4	4	5	3	3	1
Permitted Phases						2			4			3
Actuated Green, G (s)	29.7	110.6		18.1	99.0	106.7	18.6	18.6	36.7	7.7	7.7	37.4
Effective Green, g (s)	31.7	112.6		20.1	101.0	110.7	18.6	18.6	36.7	7.7	7.7	37.4
Actuated g/C Ratio	0.18	0.63		0.11	0.56	0.62	0.10	0.10	0.20	0.04	0.04	0.21
Clearance Time (s)	6.5	6.5		6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Vehicle Extension (s)	1.5	3.0		2.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	1.5
Lane Grp Cap (vph)	311	3139		383	2853	973	354	192	322	71	73	328
v/s Ratio Prot	c0.16	c0.41		0.09	0.27	c0.02	0.03	c0.08	0.01	0.01	0.01	0.00
v/s Ratio Perm						0.22			0.01			0.00
v/c Ratio	0.89	0.66		0.84	0.49	0.40	0.28	0.77	0.12	0.31	0.30	0.01
Uniform Delay, d1	72.5	21.4		78.4	23.8	17.7	74.5	78.6	58.5	83.6	83.5	56.6
Progression Factor	1.00	1.00		1.03	0.73	0.44	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	25.1	1.1		12.7	0.5	0.1	0.2	15.0	0.1	0.9	0.8	0.0
Delay (s)	97.5	22.5		93.5	17.8	7.9	74.6	93.6	58.6	84.5	84.4	56.7
Level of Service	F	C		F	B	A	E	F	E	F	F	E
Approach Delay (s)		31.4			26.6			73.8			75.2	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

Lane Group	EBT	EBR	WBT	SBL2	SBR
Lane Group Flow (vph)	1397	695	1440	537	737
v/c Ratio	0.27	0.44	0.49	0.82	0.72
Control Delay	0.1	1.2	16.1	62.0	52.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.1	1.2	16.1	62.0	52.3
Queue Length 50th (ft)	0	0	390	575	424
Queue Length 95th (ft)	0	5	461	644	445
Internal Link Dist (ft)	548		319		
Turn Bay Length (ft)		150			
Base Capacity (vph)	5085	1583	2957	899	1416
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.27	0.44	0.49	0.60	0.52

Intersection Summary

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑	↱		↑↑↑		↰		↱↱		
Traffic Volume (vph)	0	1285	660	0	1325	0	510	0	700	0	0
Future Volume (vph)	0	1285	660	0	1325	0	510	0	700	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		2.0	2.0		4.5		4.5		4.5		
Lane Util. Factor		0.91	1.00		0.91		1.00		0.88		
Frt		1.00	0.85		1.00		1.00		0.85		
Flt Protected		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (prot)		5085	1583		5085		1770		2787		
Flt Permitted		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (perm)		5085	1583		5085		1770		2787		
Peak-hour factor, PHF	0.92	0.92	0.95	0.92	0.92	0.92	0.95	0.92	0.95	0.92	0.92
Adj. Flow (vph)	0	1397	695	0	1440	0	537	0	737	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1397	695	0	1440	0	537	0	737	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA	Perm		NA		Prot		Prot		
Protected Phases		Free!			2		8!		3		
Permitted Phases			Free								
Actuated Green, G (s)		180.0	180.0		102.7		64.3		64.3		
Effective Green, g (s)		180.0	180.0		104.7		66.3		66.3		
Actuated g/C Ratio		1.00	1.00		0.58		0.37		0.37		
Clearance Time (s)					6.5		6.5		6.5		
Vehicle Extension (s)					3.0		2.5		2.5		
Lane Grp Cap (vph)		5085	1583		2957		651		1026		
v/s Ratio Prot		0.27			c0.28		c0.30		0.26		
v/s Ratio Perm			0.44								
v/c Ratio		0.27	0.44		0.49		0.82		0.72		
Uniform Delay, d1		0.0	0.0		22.0		51.6		48.8		
Progression Factor		1.00	1.00		0.67		1.00		1.00		
Incremental Delay, d2		0.1	0.7		0.5		8.2		2.3		
Delay (s)		0.1	0.7		15.2		59.8		51.1		
Level of Service		A	A		B		E		D		
Approach Delay (s)		0.3			15.2			54.8		0.0	
Approach LOS		A			B			D		A	

Intersection Summary			
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

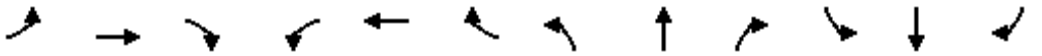
! Phase conflict between lane groups.

c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	1364	1549	772	576	758
v/c Ratio	0.47	0.53	0.49	0.32	0.74
Control Delay	9.8	12.0	2.1	20.9	27.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.8	12.0	2.1	20.9	27.7
Queue Length 50th (ft)	103	323	13	81	194
Queue Length 95th (ft)	238	m245	m2	98	242
Internal Link Dist (ft)	286	371			
Turn Bay Length (ft)			250	350	350
Base Capacity (vph)	2900	2900	1568	2106	1205
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.47	0.53	0.49	0.27	0.63

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1255	0	0	1425	710	530	0	720	0	0	0
Future Volume (vph)	0	1255	0	0	1425	710	530	0	720	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5	2.0	2.0		2.0			
Lane Util. Factor		0.91			0.91	1.00	0.94		0.88			
Frt		1.00			1.00	0.85	1.00		0.85			
Flt Protected		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085			5085	1568	4990		2787			
Flt Permitted		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085			5085	1568	4990		2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.92	0.92	0.92
Adj. Flow (vph)	0	1364	0	0	1549	772	576	0	758	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	32	0	0	0
Lane Group Flow (vph)	0	1364	0	0	1549	772	576	0	726	0	0	0
Heavy Vehicles (%)	3%	2%	2%	2%	2%	3%	2%	3%	2%	3%	3%	3%
Turn Type		NA			NA	Free	Prot		Prot			
Protected Phases		6			2		4		4			
Permitted Phases						Free						
Actuated Green, G (s)		49.3			49.3	90.0	30.2		30.2			
Effective Green, g (s)		51.3			51.3	90.0	32.2		32.2			
Actuated g/C Ratio		0.57			0.57	1.00	0.36		0.36			
Clearance Time (s)		6.5			6.5		4.0		4.0			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		2898			2898	1568	1785		997			
v/s Ratio Prot		0.27			0.30		0.12		c0.26			
v/s Ratio Perm						c0.49						
v/c Ratio		0.47			0.53	0.49	0.32		0.73			
Uniform Delay, d1		11.4			12.0	0.0	21.0		25.1			
Progression Factor		0.77			0.92	1.00	1.00		1.00			
Incremental Delay, d2		0.5			0.5	0.7	0.1		2.7			
Delay (s)		9.3			11.4	0.7	21.1		27.8			
Level of Service		A			B	A	C		C			
Approach Delay (s)		9.3			7.9			24.9			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.5
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	315	1717	114	76	1815	87	435	87	147	33	5	71
v/c Ratio	0.83	0.54	0.11	0.60	0.61	0.09	1.33	0.26	0.37	0.40	0.08	0.39
Control Delay	85.9	16.7	2.2	100.5	25.5	0.6	218.5	67.4	11.2	75.0	87.0	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.9	16.7	2.2	100.5	25.5	0.6	218.5	67.4	11.2	75.0	87.0	6.3
Queue Length 50th (ft)	199	284	4	88	499	0	~601	91	0	31	6	0
Queue Length 95th (ft)	#263	367	30	150	545	5	#828	151	68	66	22	0
Internal Link Dist (ft)		660			631			513			403	
Turn Bay Length (ft)	300		150	100		200	125					340
Base Capacity (vph)	390	3167	1035	149	2965	977	326	641	641	82	393	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.54	0.11	0.51	0.61	0.09	1.33	0.14	0.23	0.40	0.01	0.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis

4: SW Natura Boulevard/Fairway Drive & Hillsboro Bvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	290	1580	105	70	1670	80	400	80	135	30	5	65
Future Volume (vph)	290	1580	105	70	1670	80	400	80	135	30	5	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.41	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	767	1863	1583	1305	1863	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)	315	1717	114	76	1815	87	435	87	147	33	5	71
RTOR Reduction (vph)	0	0	44	0	0	37	0	0	121	0	0	68
Lane Group Flow (vph)	315	1717	70	76	1815	50	435	87	26	33	5	3
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2	4		4	8		8
Actuated Green, G (s)	18.0	109.0	109.0	10.8	101.8	101.8	41.2	32.0	32.0	10.4	7.2	7.2
Effective Green, g (s)	20.0	111.0	111.0	12.8	103.8	103.8	41.2	32.0	32.0	10.4	7.2	7.2
Actuated g/C Ratio	0.11	0.62	0.62	0.07	0.58	0.58	0.23	0.18	0.18	0.06	0.04	0.04
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.0	3.0	3.0	1.5	3.0	3.0	1.5	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	381	3135	976	125	2932	912	331	331	281	83	74	63
v/s Ratio Prot	c0.09	0.34		0.04	c0.36		c0.20	0.05		0.01	0.00	
v/s Ratio Perm			0.04			0.03	c0.10		0.02	0.02		0.00
v/c Ratio	0.83	0.55	0.07	0.61	0.62	0.06	1.31	0.26	0.09	0.40	0.07	0.05
Uniform Delay, d1	78.3	20.0	13.8	81.2	25.1	16.7	66.8	63.8	61.9	81.4	83.2	83.1
Progression Factor	0.89	0.82	1.49	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.5	0.6	0.1	5.6	1.0	0.1	161.3	0.2	0.1	1.1	0.1	0.1
Delay (s)	81.2	17.0	20.7	86.8	26.1	16.8	228.1	64.0	61.9	82.6	83.3	83.2
Level of Service	F	B	C	F	C	B	F	E	E	F	F	F
Approach Delay (s)		26.6			28.0			170.2			83.0	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM 2000 Control Delay	48.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Queues

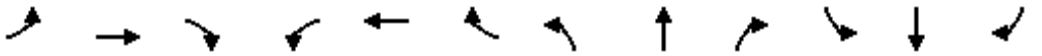
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	386	1429	141	342	891	505	190	723	620	500	598	310
v/c Ratio	0.79	1.00	0.16	0.74	0.63	0.55	0.66	1.03	0.95	1.02	0.66	0.50
Control Delay	86.5	75.6	5.2	108.9	25.5	11.5	91.2	110.6	69.8	118.5	64.0	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.5	75.6	5.2	108.9	25.5	11.5	91.2	110.6	69.8	118.5	64.0	10.5
Queue Length 50th (ft)	229	~932	10	219	166	77	113	~478	610	~320	338	23
Queue Length 95th (ft)	288	#1069	49	276	321	198	160	#615	#871	#443	410	117
Internal Link Dist (ft)		620			1001			569			457	
Turn Bay Length (ft)	550		500	550		500	300		300	650		650
Base Capacity (vph)	545	1433	879	486	1405	923	310	701	661	492	911	619
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	1.00	0.16	0.70	0.63	0.55	0.61	1.03	0.94	1.02	0.66	0.50

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

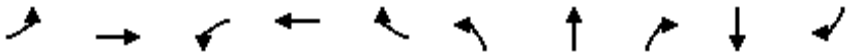
HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	355	1315	130	315	820	465	175	665	570	460	550	285
Future Volume (vph)	355	1315	130	315	820	465	175	665	570	460	550	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.9	5.5	4.0	5.9	5.9	5.9	5.5	5.9	5.9	5.9
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	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)	386	1429	141	342	891	505	190	723	620	500	598	310
RTOR Reduction (vph)	0	0	63	0	0	34	0	0	76	0	0	212
Lane Group Flow (vph)	386	1429	78	342	891	471	190	723	544	500	598	98
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	
Permitted Phases			6			2			4			8
Actuated Green, G (s)	23.7	70.9	84.0	22.3	69.5	93.3	13.1	33.7	56.0	23.8	44.4	44.4
Effective Green, g (s)	25.7	72.9	88.0	24.3	71.5	97.3	15.1	35.7	60.0	25.8	46.4	46.4
Actuated g/C Ratio	0.14	0.41	0.49	0.14	0.40	0.54	0.08	0.20	0.33	0.14	0.26	0.26
Clearance Time (s)	7.5	6.0	7.9	7.5	6.0	7.9	7.9	7.9	7.5	7.9	7.9	7.9
Vehicle Extension (s)	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	3.0
Lane Grp Cap (vph)	490	1433	773	463	1405	855	287	701	527	492	912	408
v/s Ratio Prot	0.11	c0.40	0.01	0.10	0.25	0.08	0.06	0.20	c0.14	c0.15	0.17	
v/s Ratio Perm			0.04			0.22			0.20			0.06
v/c Ratio	0.79	1.00	0.10	0.74	0.63	0.55	0.66	1.03	1.03	1.02	0.66	0.24
Uniform Delay, d1	74.5	53.4	24.7	74.8	43.7	27.0	80.0	72.2	60.0	77.1	59.7	52.9
Progression Factor	1.00	1.00	1.00	1.34	0.53	0.44	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.6	23.1	0.0	4.5	1.9	0.4	4.4	42.3	47.7	44.7	1.7	0.3
Delay (s)	82.1	76.6	24.8	104.7	25.1	12.4	84.4	114.4	107.7	121.8	61.4	53.2
Level of Service	F	E	C	F	C	B	F	F	F	F	E	D
Approach Delay (s)		73.9			37.1			108.0			81.0	
Approach LOS		E			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	73.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		

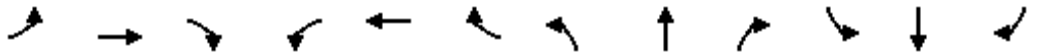
c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	332	2217	402	1576	364	38	38	109	54	98
v/c Ratio	0.46	0.61	0.76	0.59	0.37	0.27	0.27	0.23	0.55	0.14
Control Delay	50.3	16.4	83.1	31.6	6.1	82.8	82.6	12.3	101.1	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.3	16.4	83.1	31.6	6.1	82.8	82.6	12.3	101.1	7.6
Queue Length 50th (ft)	165	293	241	434	45	45	45	13	63	0
Queue Length 95th (ft)	m176	m338	291	420	68	91	91	64	114	26
Internal Link Dist (ft)		900		925			695		185	
Turn Bay Length (ft)	700		750		700			150		
Base Capacity (vph)	723	3658	667	2757	993	158	161	508	132	717
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	0.46	0.61	0.60	0.57	0.37	0.24	0.24	0.21	0.41	0.14

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

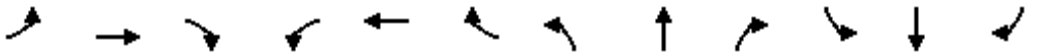


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	1530	510	370	1450	335	60	10	100	40	10	90
Future Volume (vph)	305	1530	510	370	1450	335	60	10	100	40	10	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	0.97	0.86		0.97	0.91	1.00	0.95	0.95	1.00		1.00	0.88
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	0.97	1.00		0.96	1.00
Satd. Flow (prot)	3367	6168		3433	5085	1524	1681	1709	1583		1593	2030
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	0.97	1.00		0.96	1.00
Satd. Flow (perm)	3367	6168		3433	5085	1524	1681	1709	1583		1593	2030
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)	332	1663	554	402	1576	364	65	11	109	43	11	98
RTOR Reduction (vph)	0	28	0	0	0	172	0	0	70	0	0	69
Lane Group Flow (vph)	332	2189	0	402	1576	192	38	38	39	0	54	29
Heavy Vehicles (%)	4%	2%	2%	2%	2%	6%	2%	2%	2%	18%	2%	40%
Turn Type	Prot	NA		Prot	NA	Prot	Split	NA	pt+ov	Split	NA	pt+ov
Protected Phases	1	6		5	2	2	3	3	3 5	4	4	4 1
Permitted Phases												
Actuated Green, G (s)	36.7	103.9		25.8	93.0	93.0	15.0	15.0	46.8		11.3	54.0
Effective Green, g (s)	38.7	105.9		27.8	95.0	95.0	15.0	15.0	46.8		11.3	54.0
Actuated g/C Ratio	0.22	0.59		0.15	0.53	0.53	0.08	0.08	0.26		0.06	0.30
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	1.5	3.0		2.5	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	723	3628		530	2683	804	140	142	411		100	609
v/s Ratio Prot	0.10	c0.35		c0.12	0.31	0.13	c0.02	0.02	0.02		c0.03	0.01
v/s Ratio Perm												
v/c Ratio	0.46	0.60		0.76	0.59	0.24	0.27	0.27	0.09		0.54	0.05
Uniform Delay, d1	61.5	23.6		72.9	29.1	23.0	77.4	77.3	50.5		81.8	44.7
Progression Factor	0.80	0.69		1.03	1.04	2.66	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.2		5.0	0.8	0.6	1.1	1.0	0.1		5.8	0.0
Delay (s)	49.5	16.4		80.2	31.1	61.7	78.4	78.4	50.6		87.7	44.8
Level of Service	D	B		F	C	E	E	E	D		F	D
Approach Delay (s)		20.7			44.3			62.0			60.0	
Approach LOS		C			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	1803	616	1810	337	516
v/c Ratio	0.73	0.60	0.53	0.36	0.67
Control Delay	32.2	28.8	12.3	53.7	63.1
Queue Delay	0.0	0.0	0.2	0.0	0.0
Total Delay	32.2	28.8	12.5	53.7	63.1
Queue Length 50th (ft)	404	201	209	166	310
Queue Length 95th (ft)	405	189	364	215	387
Internal Link Dist (ft)	925		322		
Turn Bay Length (ft)		500		500	500
Base Capacity (vph)	2479	1048	3432	945	767
Starvation Cap Reductn	0	0	690	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.73	0.59	0.66	0.36	0.67

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1295	375	585	1665	0	0	0	0	320	0	490
Future Volume (vph)	0	1295	375	585	1665	0	0	0	0	320	0	490
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.5					4.4		4.4
Lane Util. Factor		0.81		0.97	0.91					0.97		0.88
Frt		0.97		1.00	1.00					1.00		0.85
Flt Protected		1.00		0.95	1.00					0.95		1.00
Satd. Flow (prot)		7296		3433	5085					3433		2787
Flt Permitted		1.00		0.95	1.00					0.95		1.00
Satd. Flow (perm)		7296		3433	5085					3433		2787
Peak-hour factor, PHF	0.92	0.92	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	0	1408	395	616	1810	0	0	0	0	337	0	516
RTOR Reduction (vph)	0	28	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1775	0	616	1810	0	0	0	0	337	0	516
Turn Type		NA		Prot	NA					Prot		Prot
Protected Phases		6		5 4	2 4					3		3
Permitted Phases												
Actuated Green, G (s)		58.5		49.1	119.6					47.6		47.6
Effective Green, g (s)		60.5		53.1	121.6					49.6		49.6
Actuated g/C Ratio		0.34		0.30	0.68					0.28		0.28
Clearance Time (s)		6.0								6.4		6.4
Vehicle Extension (s)		3.0								2.0		2.0
Lane Grp Cap (vph)		2452		1012	3435					945		767
v/s Ratio Prot		c0.24		c0.18	0.36					0.10		c0.19
v/s Ratio Perm												
v/c Ratio		0.72		0.61	0.53					0.36		0.67
Uniform Delay, d1		52.4		54.5	14.7					52.4		58.0
Progression Factor		0.59		0.96	0.79					1.00		1.00
Incremental Delay, d2		1.6		1.0	0.2					0.1		1.8
Delay (s)		32.7		53.5	11.8					52.5		59.8
Level of Service		C		D	B					D		E
Approach Delay (s)		32.7			22.4			0.0			56.9	
Approach LOS		C			C			A			E	

Intersection Summary			
HCM 2000 Control Delay	31.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	NBL	NBR
Lane Group Flow (vph)	1299	442	2087	632	442
v/c Ratio	0.42	0.16	0.36	0.68	0.66
Control Delay	3.3	0.1	5.8	72.4	73.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.3	0.1	5.8	72.4	73.2
Queue Length 50th (ft)	47	0	86	250	215
Queue Length 95th (ft)	50	0	233	297	269
Internal Link Dist (ft)	233		630	1225	
Turn Bay Length (ft)		700		410	430
Base Capacity (vph)	3121	2787	5762	931	673
Starvation Cap Reductn	30	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.42	0.16	0.36	0.68	0.66

Intersection Summary

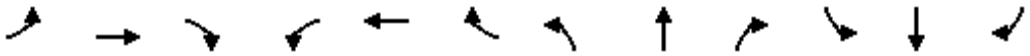
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1195	420	0	1920	600	420
Future Volume (vph)	1195	420	0	1920	600	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	2.0		4.5	4.4	4.4
Lane Util. Factor	0.91	0.88		0.81	0.94	0.76
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	5085	2787		7544	4990	3610
Flt Permitted	1.00	1.00		1.00	0.95	1.00
Satd. Flow (perm)	5085	2787		7544	4990	3610
Peak-hour factor, PHF	0.92	0.95	0.92	0.92	0.95	0.95
Adj. Flow (vph)	1299	442	0	2087	632	442
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1299	442	0	2087	632	442
Turn Type	NA	Free		NA	Prot	Prot
Protected Phases	6 3			2 3	4	4
Permitted Phases		Free				
Actuated Green, G (s)	106.1	180.0		135.5	31.6	31.6
Effective Green, g (s)	110.1	180.0		133.1	33.6	33.6
Actuated g/C Ratio	0.61	1.00		0.74	0.19	0.19
Clearance Time (s)					6.4	6.4
Vehicle Extension (s)					3.5	3.5
Lane Grp Cap (vph)	3110	2787		5578	931	673
v/s Ratio Prot	c0.26			c0.28	c0.13	0.12
v/s Ratio Perm		0.16				
v/c Ratio	0.42	0.16		0.37	0.68	0.66
Uniform Delay, d1	18.2	0.0		8.4	68.2	67.9
Progression Factor	0.32	1.00		0.82	1.00	1.00
Incremental Delay, d2	0.0	0.1		0.0	2.1	2.4
Delay (s)	5.9	0.1		6.9	70.2	70.3
Level of Service	A	A		A	E	E
Approach Delay (s)	4.4			6.9	70.3	
Approach LOS	A			A	E	

Intersection Summary			
HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues

5: Research Park Boulevard/SW Natura Boulevard & SR 869/SW 10th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	223	1245	288	103	1500	87	261	141	130	239	163	326
v/c Ratio	0.69	0.43	0.28	0.54	0.55	0.10	0.81	0.27	0.38	0.71	0.77	0.84
Control Delay	70.4	14.3	1.5	93.3	30.0	1.2	71.7	68.1	11.2	64.3	99.3	39.9
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.4	14.5	1.5	93.3	30.0	1.2	71.7	68.1	11.2	64.3	99.3	39.9
Queue Length 50th (ft)	121	126	9	62	434	0	255	78	0	230	191	108
Queue Length 95th (ft)	182	177	14	97	545	10	326	109	60	299	265	226
Internal Link Dist (ft)		630			1233			1112			1327	
Turn Bay Length (ft)	300		300	200		300	260		260	170		170
Base Capacity (vph)	373	2919	1031	202	2720	904	342	890	497	350	396	523
Starvation Cap Reductn	0	648	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.55	0.28	0.51	0.55	0.10	0.76	0.16	0.26	0.68	0.41	0.62

Intersection Summary

HCM Signalized Intersection Capacity Analysis

5: Research Park Boulevard/SW Natura Boulevard & SR 869/SW 10th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	1145	265	95	1380	80	240	130	120	220	150	300
Future Volume (vph)	205	1145	265	95	1380	80	240	130	120	220	150	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.4	4.4	4.4	4.4	4.4	5.7	5.7	5.7	5.7	5.7	5.7
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	1770	3539	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.26	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	483	3539	1583	1234	1863	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)	223	1245	288	103	1500	87	261	141	130	239	163	326
RTOR Reduction (vph)	0	0	123	0	0	41	0	0	111	0	0	210
Lane Group Flow (vph)	223	1245	165	103	1500	46	261	141	19	239	163	116
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2	4		4	8		8
Actuated Green, G (s)	15.1	101.3	101.3	8.0	94.2	94.2	52.2	26.3	26.3	40.8	20.6	20.6
Effective Green, g (s)	17.1	103.3	103.3	10.0	96.2	96.2	52.2	26.3	26.3	40.8	20.6	20.6
Actuated g/C Ratio	0.10	0.57	0.57	0.06	0.53	0.53	0.29	0.15	0.15	0.23	0.11	0.11
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	5.7	5.7	5.7	5.7	5.7	5.7
Vehicle Extension (s)	1.5	3.0	3.0	1.5	3.0	3.0	1.5	2.0	2.0	1.5	2.0	2.0
Lane Grp Cap (vph)	326	2918	908	190	2717	846	325	517	231	339	213	181
v/s Ratio Prot	c0.06	0.24		0.03	c0.29		c0.12	0.04		0.08	0.09	
v/s Ratio Perm			0.10			0.03	c0.12		0.01	0.08		0.07
v/c Ratio	0.68	0.43	0.18	0.54	0.55	0.05	0.80	0.27	0.08	0.71	0.77	0.64
Uniform Delay, d1	78.8	21.6	18.2	82.8	27.7	20.1	54.1	68.3	66.4	62.3	77.4	76.2
Progression Factor	0.77	0.61	0.43	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.2	0.4	0.4	1.7	0.2	0.0	12.6	0.1	0.1	5.4	13.7	5.7
Delay (s)	64.7	13.6	8.2	84.5	27.9	20.1	66.8	68.4	66.5	67.6	91.0	81.9
Level of Service	E	B	A	F	C	C	E	E	E	E	F	F
Approach Delay (s)		19.2			31.0			67.1			79.2	
Approach LOS		B			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	38.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	2261	152	1793	147	190
v/c Ratio	0.53	0.64	0.47	0.68	0.53
Control Delay	16.9	61.7	1.6	65.1	11.8
Queue Delay	0.0	1.6	0.1	0.0	0.0
Total Delay	16.9	63.2	1.6	65.1	11.8
Queue Length 50th (ft)	250	83	26	111	0
Queue Length 95th (ft)	318	#154	27	170	64
Internal Link Dist (ft)	575		175	531	
Turn Bay Length (ft)					
Base Capacity (vph)	4261	236	3824	545	619
Starvation Cap Reductn	0	19	458	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.53	0.70	0.53	0.27	0.31

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1975	105	140	1650	135	175
Future Volume (vph)	1975	105	140	1650	135	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	9.0	9.0
Lane Util. Factor	0.81		1.00	0.91	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	7487		1770	5085	1770	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	7487		1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2147	114	152	1793	147	190
RTOR Reduction (vph)	5	0	0	0	0	167
Lane Group Flow (vph)	2256	0	152	1793	147	23
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2 3		1	1 2 3	4	
Permitted Phases					4	4
Actuated Green, G (s)	66.2		14.0	88.2	14.8	14.8
Effective Green, g (s)	68.2		16.0	90.2	14.8	14.8
Actuated g/C Ratio	0.57		0.13	0.75	0.12	0.12
Clearance Time (s)			8.0		9.0	9.0
Vehicle Extension (s)			1.5		2.0	2.0
Lane Grp Cap (vph)	4255		236	3822	218	195
v/s Ratio Prot	c0.30		c0.09	0.35	c0.08	
v/s Ratio Perm						0.01
v/c Ratio	0.53		0.64	0.47	0.67	0.12
Uniform Delay, d1	16.0		49.3	5.7	50.3	46.8
Progression Factor	1.00		1.00	0.19	1.00	1.00
Incremental Delay, d2	0.1		4.1	0.0	6.3	0.1
Delay (s)	16.1		53.2	1.1	56.6	46.9
Level of Service	B		D	A	E	D
Approach Delay (s)	16.1			5.2	51.1	
Approach LOS	B			A	D	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	92	2245	1783	82	250	163
v/c Ratio	0.70	0.47	0.44	0.08	0.59	0.49
Control Delay	63.8	2.3	9.7	1.3	55.0	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.8	2.4	9.7	1.3	55.0	13.2
Queue Length 50th (ft)	70	26	177	3	95	5
Queue Length 95th (ft)	#152	42	238	m4	130	64
Internal Link Dist (ft)		175	1004		271	
Turn Bay Length (ft)				450		
Base Capacity (vph)	132	4818	4017	1023	1058	595
Starvation Cap Reductn	0	529	0	0	0	0
Spillback Cap Reductn	0	0	14	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.52	0.45	0.08	0.24	0.27

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	85	2065	1640	75	230	150
Future Volume (vph)	85	2065	1640	75	230	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	9.0	9.0
Lane Util. Factor	1.00	0.86	0.86	1.00	0.97	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	0.95	1.00
Satd. Flow (prot)	1770	6408	6408	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	6408	6408	1583	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	2245	1783	82	250	163
RTOR Reduction (vph)	0	0	0	31	0	137
Lane Group Flow (vph)	92	2245	1783	51	250	26
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	3	1 2 3	1 2		4	
Permitted Phases				1 2		4
Actuated Green, G (s)	7.0	88.2	73.2	73.2	14.8	14.8
Effective Green, g (s)	9.0	90.2	75.2	75.2	14.8	14.8
Actuated g/C Ratio	0.08	0.75	0.63	0.63	0.12	0.12
Clearance Time (s)	8.0				9.0	9.0
Vehicle Extension (s)	1.5				2.0	2.0
Lane Grp Cap (vph)	132	4816	4015	992	423	195
v/s Ratio Prot	c0.05	c0.35	0.28		c0.07	
v/s Ratio Perm				0.03		0.02
v/c Ratio	0.70	0.47	0.44	0.05	0.59	0.13
Uniform Delay, d1	54.2	5.7	11.6	8.6	49.7	46.9
Progression Factor	0.72	0.34	0.78	0.50	1.00	1.00
Incremental Delay, d2	10.7	0.0	0.0	0.0	1.5	0.1
Delay (s)	49.7	2.0	9.1	4.4	51.2	47.0
Level of Service	D	A	A	A	D	D
Approach Delay (s)		3.8	8.9		49.6	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	SBL2	SBR
Lane Group Flow (vph)	1527	937	1380	437	468
v/c Ratio	0.42	0.59	0.47	0.52	0.69
Control Delay	5.3	7.7	6.9	21.9	26.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.3	7.7	6.9	21.9	26.2
Queue Length 50th (ft)	72	236	106	69	85
Queue Length 95th (ft)	126	363	145	107	134
Internal Link Dist (ft)	1004		259		
Turn Bay Length (ft)		250			
Base Capacity (vph)	3663	1583	2907	886	719
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.42	0.59	0.47	0.49	0.65

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑↑	↱		↑↑↑		↰↰		↱↱		
Traffic Volume (vph)	0	1405	890	0	1270	0	415	0	445	0	0
Future Volume (vph)	0	1405	890	0	1270	0	415	0	445	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	2.0		5.5		5.5		5.5		
Lane Util. Factor		0.86	1.00		0.91		0.97		0.88		
Frt		1.00	0.85		1.00		1.00		0.85		
Flt Protected		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (prot)		6408	1583		5085		3433		2787		
Flt Permitted		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (perm)		6408	1583		5085		3433		2787		
Peak-hour factor, PHF	0.92	0.92	0.95	0.92	0.92	0.92	0.95	0.92	0.95	0.92	0.92
Adj. Flow (vph)	0	1527	937	0	1380	0	437	0	468	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1527	937	0	1380	0	437	0	468	0	0
Turn Type		NA	Free		NA		Prot		Prot		
Protected Phases		6			2		3		3		
Permitted Phases			Free								
Actuated Green, G (s)		32.3	60.0		32.3		12.7		12.7		
Effective Green, g (s)		34.3	60.0		34.3		14.7		14.7		
Actuated g/C Ratio		0.57	1.00		0.57		0.24		0.24		
Clearance Time (s)		7.5			7.5		7.5		7.5		
Vehicle Extension (s)		3.0			3.0		2.5		2.5		
Lane Grp Cap (vph)		3663	1583		2906		841		682		
v/s Ratio Prot		0.24			0.27		0.13		0.17		
v/s Ratio Perm			c0.59								
v/c Ratio		0.42	0.59		0.47		0.52		0.69		
Uniform Delay, d1		7.2	0.0		7.6		19.6		20.6		
Progression Factor		0.68	1.00		0.83		1.00		1.00		
Incremental Delay, d2		0.3	1.5		0.4		0.4		2.6		
Delay (s)		5.2	1.5		6.7		20.0		23.2		
Level of Service		A	A		A		C		C		
Approach Delay (s)		3.8			6.7			21.6		0.0	
Approach LOS		A			A			C		A	

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL2	NBR
Lane Group Flow (vph)	1120	1848	453	484	358
v/c Ratio	0.37	0.62	0.29	0.62	0.56
Control Delay	5.1	4.6	0.2	24.5	24.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.1	4.6	0.2	24.5	24.2
Queue Length 50th (ft)	82	91	0	79	64
Queue Length 95th (ft)	56	m143	m0	121	104
Internal Link Dist (ft)	270	1155			
Turn Bay Length (ft)			250		
Base Capacity (vph)	2991	2991	1583	829	673
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.37	0.62	0.29	0.58	0.53

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations		↑↑↑			↑↑↑	↱	↰↰		↱↱		
Traffic Volume (vph)	0	1030	0	0	1700	430	460	0	340	0	0
Future Volume (vph)	0	1030	0	0	1700	430	460	0	340	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5	2.0	5.5		5.5		
Lane Util. Factor		0.91			0.91	1.00	0.97		0.88		
Frt		1.00			1.00	0.85	1.00		0.85		
Flt Protected		1.00			1.00	1.00	0.95		1.00		
Satd. Flow (prot)		5085			5085	1583	3433		2787		
Flt Permitted		1.00			1.00	1.00	0.95		1.00		
Satd. Flow (perm)		5085			5085	1583	3433		2787		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.92	0.95	0.92	0.92
Adj. Flow (vph)	0	1120	0	0	1848	453	484	0	358	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1120	0	0	1848	453	484	0	358	0	0
Turn Type		NA			NA	Free	Prot		Prot		
Protected Phases		6			2		4		4		
Permitted Phases						Free					
Actuated Green, G (s)		33.3			33.3	60.0	11.7		11.7		
Effective Green, g (s)		35.3			35.3	60.0	13.7		13.7		
Actuated g/C Ratio		0.59			0.59	1.00	0.23		0.23		
Clearance Time (s)		7.5			7.5		7.5		7.5		
Vehicle Extension (s)		3.0			3.0		2.5		2.5		
Lane Grp Cap (vph)		2991			2991	1583	783		636		
v/s Ratio Prot		0.22			c0.36		c0.14		0.13		
v/s Ratio Perm						0.29					
v/c Ratio		0.37			0.62	0.29	0.62		0.56		
Uniform Delay, d1		6.5			8.0	0.0	20.8		20.5		
Progression Factor		0.71			0.51	1.00	1.00		1.00		
Incremental Delay, d2		0.3			0.4	0.2	1.2		0.9		
Delay (s)		5.0			4.5	0.2	22.0		21.4		
Level of Service		A			A	A	C		C		
Approach Delay (s)		5.0			3.7			21.8		0.0	
Approach LOS		A			A			C		A	

Intersection Summary			
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues

5: NE 3rd Ave & Sample Road

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	386	1103	49	1658	212	217	65	92	212	516
v/c Ratio	0.91	0.48	0.43	0.87	0.63	0.43	0.12	0.28	0.44	0.98
Control Delay	71.5	18.3	66.2	40.8	40.4	39.2	0.5	29.1	40.1	66.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.5	18.3	66.2	40.8	40.4	39.2	0.5	29.1	40.1	66.1
Queue Length 50th (ft)	147	201	37	433	117	138	0	47	136	297
Queue Length 95th (ft)	#243	259	79	501	183	214	0	86	212	#526
Internal Link Dist (ft)		1155		834		912			742	
Turn Bay Length (ft)	550		490		250		225	200		
Base Capacity (vph)	425	2284	116	1899	335	507	543	327	492	531
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	0.91	0.48	0.42	0.87	0.63	0.43	0.12	0.28	0.43	0.97

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	355	900	115	45	1460	65	195	200	60	85	195	475
Future Volume (vph)	355	900	115	45	1460	65	195	200	60	85	195	475
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	4950		1752	5004		1752	1845	1568	1752	1845	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.49	1.00	1.00	0.52	1.00	1.00
Satd. Flow (perm)	3400	4950		1752	5004		913	1845	1568	967	1845	1568
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)	386	978	125	49	1587	71	212	217	65	92	212	516
RTOR Reduction (vph)	0	13	0	0	4	0	0	0	47	0	0	114
Lane Group Flow (vph)	386	1090	0	49	1654	0	212	217	18	92	212	402
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	13.0	51.6		4.8	43.4		38.6	32.6	32.6	36.6	31.6	31.6
Effective Green, g (s)	15.0	53.6		6.8	45.4		38.6	32.6	32.6	36.6	31.6	31.6
Actuated g/C Ratio	0.12	0.45		0.06	0.38		0.32	0.27	0.27	0.31	0.26	0.26
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	1.5	3.0		1.5	3.0		1.5	2.0	2.0	1.5	2.0	2.0
Lane Grp Cap (vph)	425	2211		99	1893		335	501	425	327	485	412
v/s Ratio Prot	c0.11	0.22		0.03	c0.33		c0.03	0.12		0.01	0.11	
v/s Ratio Perm							0.17		0.01	0.07		c0.26
v/c Ratio	0.91	0.49		0.49	0.87		0.63	0.43	0.04	0.28	0.44	0.98
Uniform Delay, d1	51.8	23.6		54.9	34.6		34.8	36.1	32.2	30.7	36.8	43.8
Progression Factor	0.90	0.77		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.1	0.7		1.4	6.0		2.9	0.2	0.0	0.2	0.2	37.4
Delay (s)	67.5	18.9		56.4	40.6		37.6	36.3	32.2	30.9	37.0	81.2
Level of Service	E	B		E	D		D	D	C	C	D	F
Approach Delay (s)		31.5			41.1			36.3			64.1	
Approach LOS		C			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	41.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	43	1956	250	2163	54	223	11	332	268	276	337
v/c Ratio	0.42	0.82	1.25	0.90	0.05	0.64	0.06	0.89	0.83	0.84	0.67
Control Delay	67.2	31.8	192.8	24.0	0.1	60.0	47.6	59.8	68.4	69.0	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.2	31.8	192.8	24.0	0.1	60.0	47.6	59.8	68.4	69.0	17.9
Queue Length 50th (ft)	33	475	~128	426	0	87	8	192	208	215	69
Queue Length 95th (ft)	72	#640	#215	#742	m0	124	26	#324	306	313	146
Internal Link Dist (ft)		580		548			436			396	
Turn Bay Length (ft)	450		375		350	225		250	200		
Base Capacity (vph)	103	2388	200	2410	1213	915	496	375	378	385	506
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.82	1.25	0.90	0.04	0.24	0.02	0.89	0.71	0.72	0.67

Intersection Summary

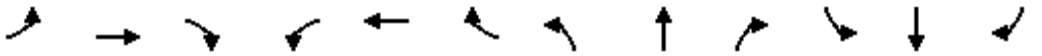
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

1: SW 12th Avenue & Hillsboro Bvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	1670	130	230	1990	50	205	10	305	410	90	310
Future Volume (vph)	40	1670	130	230	1990	50	205	10	305	410	90	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.0	6.0	6.0	6.5	6.0	6.0	6.5
Lane Util. Factor	1.00	0.91		0.97	0.91	1.00	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (prot)	1770	5030		3433	5085	1583	3433	1863	1583	1681	1714	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1770	5030		3433	5085	1583	3433	1863	1583	1681	1714	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)	43	1815	141	250	2163	54	223	11	332	446	98	337
RTOR Reduction (vph)	0	5	0	0	0	17	0	0	74	0	0	144
Lane Group Flow (vph)	43	1951	0	250	2163	37	223	11	258	268	276	193
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	1	6		5	2	3	4	4	5	3	3	1
Permitted Phases						2			4			3
Actuated Green, G (s)	5.0	54.9		5.0	54.9	77.8	12.2	12.2	17.2	22.9	22.9	27.9
Effective Green, g (s)	7.0	56.9		7.0	56.9	81.8	12.2	12.2	17.2	22.9	22.9	27.9
Actuated g/C Ratio	0.06	0.47		0.06	0.47	0.68	0.10	0.10	0.14	0.19	0.19	0.23
Clearance Time (s)	6.5	6.5		6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Vehicle Extension (s)	1.5	3.0		2.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	1.5
Lane Grp Cap (vph)	103	2385		200	2411	1079	349	189	226	320	327	368
v/s Ratio Prot	0.02	0.39		c0.07	c0.43	0.01	0.06	0.01	c0.05	0.16	c0.16	0.02
v/s Ratio Perm						0.02			0.12			0.10
v/c Ratio	0.42	0.82		1.25	0.90	0.03	0.64	0.06	1.14	0.84	0.84	0.52
Uniform Delay, d1	54.5	27.1		56.5	28.9	6.2	51.8	48.7	51.4	46.8	46.8	40.2
Progression Factor	1.00	1.00		1.20	0.60	0.02	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	3.3		140.4	4.6	0.0	2.8	0.0	103.8	16.4	17.1	0.6
Delay (s)	55.5	30.4		208.0	21.9	0.1	54.6	48.8	155.2	63.2	63.9	40.9
Level of Service	E	C		F	C	A	D	D	F	E	E	D
Approach Delay (s)		30.9			40.3			113.5			54.9	
Approach LOS		C			D			F			D	

Intersection Summary			
HCM 2000 Control Delay	46.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Queues

Lane Group	EBT	EBR	WBT	SBL2	SBR
Lane Group Flow (vph)	1918	653	1913	568	537
v/c Ratio	0.38	0.41	0.69	0.84	0.50
Control Delay	0.1	0.4	18.9	44.9	29.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.1	0.4	18.9	44.9	29.2
Queue Length 50th (ft)	0	0	238	390	176
Queue Length 95th (ft)	0	m0	527	484	207
Internal Link Dist (ft)	548		319		
Turn Bay Length (ft)		150			
Base Capacity (vph)	5085	1583	2754	803	1265
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.38	0.41	0.69	0.71	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑	↱		↑↑↑		↰		↱↱		
Traffic Volume (vph)	0	1765	620	0	1760	0	540	0	510	0	0
Future Volume (vph)	0	1765	620	0	1760	0	540	0	510	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		2.0	2.0		4.5		4.5		4.5		
Lane Util. Factor		0.91	1.00		0.91		1.00		0.88		
Frt		1.00	0.85		1.00		1.00		0.85		
Flt Protected		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (prot)		5085	1583		5085		1770		2787		
Flt Permitted		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (perm)		5085	1583		5085		1770		2787		
Peak-hour factor, PHF	0.92	0.92	0.95	0.92	0.92	0.92	0.95	0.92	0.95	0.92	0.92
Adj. Flow (vph)	0	1918	653	0	1913	0	568	0	537	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1918	653	0	1913	0	568	0	537	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA	Perm		NA		Prot		Prot		
Protected Phases		Free!			2		8!		3		
Permitted Phases			Free								
Actuated Green, G (s)		120.0	120.0		63.0		44.0		44.0		
Effective Green, g (s)		120.0	120.0		65.0		46.0		46.0		
Actuated g/C Ratio		1.00	1.00		0.54		0.38		0.38		
Clearance Time (s)					6.5		6.5		6.5		
Vehicle Extension (s)					3.0		2.5		2.5		
Lane Grp Cap (vph)		5085	1583		2754		678		1068		
v/s Ratio Prot		0.38			c0.38		c0.32		0.19		
v/s Ratio Perm			0.41								
v/c Ratio		0.38	0.41		0.69		0.84		0.50		
Uniform Delay, d1		0.0	0.0		20.2		33.6		28.3		
Progression Factor		1.00	1.00		0.82		1.00		1.00		
Incremental Delay, d2		0.1	0.4		1.1		8.7		0.3		
Delay (s)		0.1	0.4		17.7		42.4		28.5		
Level of Service		A	A		B		D		C		
Approach Delay (s)		0.2			17.7			35.6		0.0	
Approach LOS		A			B			D		A	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Queues

Lane Group	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	1832	2152	696	620	716
v/c Ratio	0.62	0.73	0.44	0.40	0.79
Control Delay	10.6	9.3	0.6	17.2	24.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	9.3	0.6	17.2	24.9
Queue Length 50th (ft)	194	134	0	60	119
Queue Length 95th (ft)	199	m267	m0	87	#193
Internal Link Dist (ft)	286	371			
Turn Bay Length (ft)			250	350	350
Base Capacity (vph)	2960	2960	1568	1580	926
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.62	0.73	0.44	0.39	0.77

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1685	0	0	1980	640	570	0	680	0	0	0
Future Volume (vph)	0	1685	0	0	1980	640	570	0	680	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5	2.0	2.0		2.0			
Lane Util. Factor		0.91			0.91	1.00	0.94		0.88			
Frt		1.00			1.00	0.85	1.00		0.85			
Flt Protected		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085			5085	1568	4990		2787			
Flt Permitted		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085			5085	1568	4990		2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.92	0.92	0.92
Adj. Flow (vph)	0	1832	0	0	2152	696	620	0	716	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	44	0	0	0
Lane Group Flow (vph)	0	1832	0	0	2152	696	620	0	672	0	0	0
Heavy Vehicles (%)	3%	2%	2%	2%	2%	3%	2%	3%	2%	3%	3%	3%
Turn Type		NA			NA	Free	Prot		Prot			
Protected Phases		6			2		4		4			
Permitted Phases						Free						
Actuated Green, G (s)		32.9			32.9	60.0	16.6		16.6			
Effective Green, g (s)		34.9			34.9	60.0	18.6		18.6			
Actuated g/C Ratio		0.58			0.58	1.00	0.31		0.31			
Clearance Time (s)		6.5			6.5		4.0		4.0			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		2957			2957	1568	1546		863			
v/s Ratio Prot		0.36			c0.42		0.12		c0.24			
v/s Ratio Perm						0.44						
v/c Ratio		0.62			0.73	0.44	0.40		0.78			
Uniform Delay, d1		8.2			9.1	0.0	16.3		18.8			
Progression Factor		1.16			0.90	1.00	1.00		1.00			
Incremental Delay, d2		0.9			1.0	0.6	0.2		4.5			
Delay (s)		10.4			9.2	0.6	16.5		23.3			
Level of Service		B			A	A	B		C			
Approach Delay (s)		10.4			7.1			20.1			0.0	
Approach LOS		B			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	6.5
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	87	2207	277	130	2250	33	288	11	125	120	54	310
v/c Ratio	0.43	0.77	0.29	1.01	0.76	0.03	1.14	0.04	0.36	0.44	0.19	0.85
Control Delay	61.9	17.0	4.8	136.9	22.5	0.1	141.6	39.3	7.1	42.1	42.4	46.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.9	17.0	4.8	136.9	22.5	0.1	141.6	39.3	7.1	42.1	42.4	46.3
Queue Length 50th (ft)	32	382	38	~103	455	0	~238	7	0	77	37	129
Queue Length 95th (ft)	m50	513	m101	#234	638	0	#294	23	36	116	68	215
Internal Link Dist (ft)		660			631			513			403	
Turn Bay Length (ft)	300		150	100		200	125					340
Base Capacity (vph)	200	2876	956	129	2952	978	253	574	588	275	589	600
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.77	0.29	1.01	0.76	0.03	1.14	0.02	0.21	0.44	0.09	0.52

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

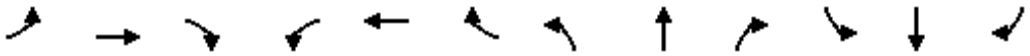
HCM Signalized Intersection Capacity Analysis

4: SW Natura Boulevard/Fairway Drive & Hillsboro Bvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	2030	255	120	2070	30	265	10	115	110	50	285
Future Volume (vph)	80	2030	255	120	2070	30	265	10	115	110	50	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.72	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	1345	1863	1583	1321	1863	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)	87	2207	277	130	2250	33	288	11	125	120	54	310
RTOR Reduction (vph)	0	0	61	0	0	14	0	0	107	0	0	123
Lane Group Flow (vph)	87	2207	216	130	2250	19	288	11	18	120	54	187
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2	4		4	8		8
Actuated Green, G (s)	5.0	65.9	65.9	6.8	67.7	67.7	21.3	17.3	17.3	23.3	18.3	18.3
Effective Green, g (s)	7.0	67.9	67.9	8.8	69.7	69.7	21.3	17.3	17.3	23.3	18.3	18.3
Actuated g/C Ratio	0.06	0.57	0.57	0.07	0.58	0.58	0.18	0.14	0.14	0.19	0.15	0.15
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.0	3.0	3.0	1.5	3.0	3.0	1.5	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	200	2877	895	129	2953	919	252	268	228	275	284	241
v/s Ratio Prot	0.03	0.43		c0.07	c0.44		c0.04	0.01		0.02	0.03	
v/s Ratio Perm			0.14			0.01	c0.16		0.01	0.07		0.12
v/c Ratio	0.43	0.77	0.24	1.01	0.76	0.02	1.14	0.04	0.08	0.44	0.19	0.78
Uniform Delay, d1	54.6	20.0	13.1	55.6	18.9	10.7	48.8	44.2	44.5	42.1	44.4	48.9
Progression Factor	1.03	0.71	0.56	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	1.5	0.5	81.3	1.9	0.0	100.7	0.0	0.1	0.4	0.1	13.3
Delay (s)	56.9	15.7	7.8	136.9	20.8	10.7	149.6	44.2	44.5	42.5	44.5	62.2
Level of Service	E	B	A	F	C	B	F	D	D	D	D	E
Approach Delay (s)		16.2			26.9			115.9			55.3	
Approach LOS		B			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	31.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Queues



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	375	1255	201	495	1603	527	179	516	342	435	810	625
v/c Ratio	1.00	0.90	0.25	0.96	1.04	0.54	0.93	0.77	0.52	0.87	0.82	1.05
Control Delay	124.3	60.7	11.3	88.4	85.5	30.0	131.4	77.7	31.5	93.3	68.4	91.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	124.3	60.7	11.3	88.4	85.5	30.0	131.4	77.7	31.5	93.3	68.4	91.1
Queue Length 50th (ft)	232	731	51	293	~1064	435	110	310	211	262	474	~613
Queue Length 95th (ft)	#349	834	107	#420	#1208	608	#192	382	317	#343	559	#868
Internal Link Dist (ft)		620			1001			569			457	
Turn Bay Length (ft)	550		500	550		500	300		300	650		650
Base Capacity (vph)	375	1397	814	516	1543	991	192	674	663	513	990	594
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.90	0.25	0.96	1.04	0.53	0.93	0.77	0.52	0.85	0.82	1.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

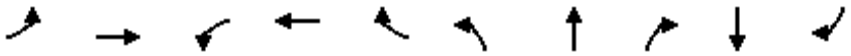
HCM Signalized Intersection Capacity Analysis

1: S Military Trail & SR 869/SW 10th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	345	1155	185	455	1475	485	165	475	315	400	745	575
Future Volume (vph)	345	1155	185	455	1475	485	165	475	315	400	745	575
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.9	5.5	4.0	5.9	5.9	5.9	5.5	5.9	5.9	5.9
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	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)	375	1255	201	495	1603	527	179	516	342	435	810	625
RTOR Reduction (vph)	0	0	68	0	0	31	0	0	75	0	0	151
Lane Group Flow (vph)	375	1255	133	495	1603	496	179	516	267	435	810	474
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	
Permitted Phases			6			2			4			8
Actuated Green, G (s)	17.7	69.1	77.2	25.1	76.5	100.7	8.1	32.3	57.4	24.2	48.4	48.4
Effective Green, g (s)	19.7	71.1	81.2	27.1	78.5	104.7	10.1	34.3	61.4	26.2	50.4	50.4
Actuated g/C Ratio	0.11	0.39	0.45	0.15	0.44	0.58	0.06	0.19	0.34	0.15	0.28	0.28
Clearance Time (s)	7.5	6.0	7.9	7.5	6.0	7.9	7.9	7.9	7.5	7.9	7.9	7.9
Vehicle Extension (s)	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	3.0
Lane Grp Cap (vph)	375	1397	714	516	1543	920	192	674	539	499	990	443
v/s Ratio Prot	0.11	0.35	0.01	c0.14	c0.45	0.08	0.05	0.15	0.07	c0.13	0.23	
v/s Ratio Perm			0.07			0.23			0.09			c0.30
v/c Ratio	1.00	0.90	0.19	0.96	1.04	0.54	0.93	0.77	0.50	0.87	0.82	1.07
Uniform Delay, d1	80.2	51.1	29.6	75.9	50.8	22.9	84.6	69.0	47.0	75.3	60.5	64.8
Progression Factor	1.00	1.00	1.00	0.84	1.14	1.62	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	46.5	9.4	0.0	23.5	30.4	0.2	45.3	5.2	0.3	14.9	5.3	62.6
Delay (s)	126.6	60.5	29.7	87.6	88.5	37.4	130.0	74.2	47.3	90.2	65.9	127.4
Level of Service	F	E	C	F	F	D	F	E	D	F	E	F
Approach Delay (s)		70.7			78.0			75.0			92.1	
Approach LOS		E			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	79.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	94.3%	ICU Level of Service	F
Analysis Period (min)	15		

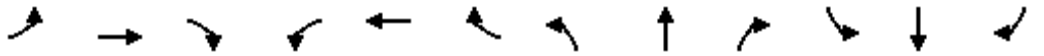
c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	87	1946	109	1777	98	211	213	429	114	435
v/c Ratio	0.52	0.63	0.58	0.71	0.12	0.67	0.67	0.77	0.45	0.80
Control Delay	74.5	22.6	91.1	45.8	9.2	77.7	77.8	42.7	72.8	61.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.5	22.6	91.1	45.8	9.2	77.7	77.8	42.7	72.8	61.8
Queue Length 50th (ft)	54	511	61	573	5	242	245	274	122	222
Queue Length 95th (ft)	m67	615	m101	718	m45	332	334	400	189	291
Internal Link Dist (ft)		900		925			695		185	
Turn Bay Length (ft)	700		750		750			150		
Base Capacity (vph)	168	3087	190	2487	795	392	394	560	300	608
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	0.52	0.63	0.57	0.71	0.12	0.54	0.54	0.77	0.38	0.72

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

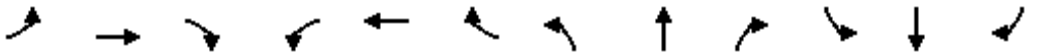


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	1715	75	100	1635	90	380	10	395	100	5	400
Future Volume (vph)	80	1715	75	100	1635	90	380	10	395	100	5	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	0.97	0.86		0.97	0.91	1.00	0.95	0.95	1.00		1.00	0.88
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	0.95	1.00		0.95	1.00
Satd. Flow (prot)	3367	6367		3433	5085	1524	1681	1689	1583		1546	2030
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	0.95	1.00		0.95	1.00
Satd. Flow (perm)	3367	6367		3433	5085	1524	1681	1689	1583		1546	2030
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)	87	1864	82	109	1777	98	413	11	429	109	5	435
RTOR Reduction (vph)	0	3	0	0	0	50	0	0	138	0	0	70
Lane Group Flow (vph)	87	1943	0	109	1777	48	211	213	291	0	114	365
Heavy Vehicles (%)	4%	2%	2%	2%	2%	6%	2%	2%	2%	18%	2%	40%
Turn Type	Prot	NA		Prot	NA	Prot	Split	NA	pt+ov	Split	NA	pt+ov
Protected Phases	1	6		5	2	2	3	3	3 5	4	4	4 1
Permitted Phases												
Actuated Green, G (s)	7.0	85.1		7.9	86.0	86.0	33.7	33.7	47.6		29.3	42.3
Effective Green, g (s)	9.0	87.1		9.9	88.0	88.0	33.7	33.7	47.6		29.3	42.3
Actuated g/C Ratio	0.05	0.48		0.06	0.49	0.49	0.19	0.19	0.26		0.16	0.23
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	1.5	3.0		2.5	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	168	3080		188	2486	745	314	316	418		251	477
v/s Ratio Prot	0.03	0.31		0.03	c0.35	0.03	0.13	0.13	c0.18		0.07	c0.18
v/s Ratio Perm												
v/c Ratio	0.52	0.63		0.58	0.71	0.06	0.67	0.67	0.70		0.45	0.77
Uniform Delay, d1	83.4	34.5		83.0	36.1	24.3	68.0	68.0	59.7		68.1	64.2
Progression Factor	0.82	0.60		0.96	1.14	1.69	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.6	0.5		3.2	1.6	0.1	5.6	5.6	5.0		1.3	7.2
Delay (s)	68.8	21.4		82.8	42.9	41.1	73.6	73.6	64.7		69.4	71.4
Level of Service	E	C		F	D	D	E	E	E		E	E
Approach Delay (s)		23.4			45.0			69.1			71.0	
Approach LOS		C			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	43.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	2386	605	1592	232	379
v/c Ratio	0.84	0.54	0.42	0.34	0.69
Control Delay	24.7	45.1	4.0	63.8	74.4
Queue Delay	0.0	0.0	0.1	0.0	0.0
Total Delay	24.7	45.1	4.1	63.8	74.4
Queue Length 50th (ft)	339	256	109	123	239
Queue Length 95th (ft)	217	315	105	169	308
Internal Link Dist (ft)	925		322		
Turn Bay Length (ft)		500		500	500
Base Capacity (vph)	2828	1125	3827	678	551
Starvation Cap Reductn	0	0	753	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.84	0.54	0.52	0.34	0.69

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1735	475	575	1465	0	0	0	0	220	0	360
Future Volume (vph)	0	1735	475	575	1465	0	0	0	0	220	0	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.5					4.4		4.4
Lane Util. Factor		0.81		0.97	0.91					0.97		0.88
Frt		0.97		1.00	1.00					1.00		0.85
Flt Protected		1.00		0.95	1.00					0.95		1.00
Satd. Flow (prot)		7307		3433	5085					3433		2787
Flt Permitted		1.00		0.95	1.00					0.95		1.00
Satd. Flow (perm)		7307		3433	5085					3433		2787
Peak-hour factor, PHF	0.92	0.92	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	0	1886	500	605	1592	0	0	0	0	232	0	379
RTOR Reduction (vph)	0	27	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2359	0	605	1592	0	0	0	0	232	0	379
Turn Type		NA		Prot	NA					Prot		Prot
Protected Phases		6		5 4	2 4					3		3
Permitted Phases												
Actuated Green, G (s)		67.0		54.6	133.5					33.6		33.6
Effective Green, g (s)		69.0		58.6	131.1					35.6		35.6
Actuated g/C Ratio		0.38		0.33	0.73					0.20		0.20
Clearance Time (s)		6.0								6.4		6.4
Vehicle Extension (s)		3.0								2.0		2.0
Lane Grp Cap (vph)		2801		1117	3703					678		551
v/s Ratio Prot		c0.32		c0.18	0.31					0.07		c0.14
v/s Ratio Perm												
v/c Ratio		0.84		0.54	0.43					0.34		0.69
Uniform Delay, d1		50.5		49.7	9.7					62.1		67.0
Progression Factor		0.44		1.45	0.46					1.00		1.00
Incremental Delay, d2		2.5		0.5	0.1					0.1		2.9
Delay (s)		25.0		72.7	4.5					62.2		69.9
Level of Service		C		E	A					E		E
Approach Delay (s)		25.0			23.3			0.0			67.0	
Approach LOS		C			C			A			E	

Intersection Summary			
HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	NBL	NBR
Lane Group Flow (vph)	1473	632	2065	463	653
v/c Ratio	0.50	0.23	0.39	0.38	0.75
Control Delay	3.0	0.1	8.6	58.1	69.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	0.1	8.6	58.1	69.3
Queue Length 50th (ft)	56	0	58	163	316
Queue Length 95th (ft)	101	0	88	202	380
Internal Link Dist (ft)	233		630	1225	
Turn Bay Length (ft)		700		410	430
Base Capacity (vph)	2966	2787	5343	1208	874
Starvation Cap Reductn	91	0	0	0	0
Spillback Cap Reductn	20	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.51	0.23	0.39	0.38	0.75

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1355	600	0	1900	440	620
Future Volume (vph)	1355	600	0	1900	440	620
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	2.0		4.5	4.4	4.4
Lane Util. Factor	0.91	0.88		0.81	0.94	0.76
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	5085	2787		7544	4990	3610
Flt Permitted	1.00	1.00		1.00	0.95	1.00
Satd. Flow (perm)	5085	2787		7544	4990	3610
Peak-hour factor, PHF	0.92	0.95	0.92	0.92	0.95	0.95
Adj. Flow (vph)	1473	632	0	2065	463	653
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1473	632	0	2065	463	653
Turn Type	NA	Free		NA	Prot	Prot
Protected Phases	6 3			2 3	4	4
Permitted Phases		Free				
Actuated Green, G (s)	100.6	180.0		125.6	41.6	41.6
Effective Green, g (s)	104.6	180.0		127.6	43.6	43.6
Actuated g/C Ratio	0.58	1.00		0.71	0.24	0.24
Clearance Time (s)					6.4	6.4
Vehicle Extension (s)					3.5	3.5
Lane Grp Cap (vph)	2954	2787		5347	1208	874
v/s Ratio Prot	c0.29			c0.27	0.09	c0.18
v/s Ratio Perm		0.23				
v/c Ratio	0.50	0.23		0.39	0.38	0.75
Uniform Delay, d1	22.2	0.0		10.5	57.0	63.1
Progression Factor	0.21	1.00		0.80	1.00	1.00
Incremental Delay, d2	0.0	0.1		0.0	0.2	3.6
Delay (s)	4.6	0.1		8.4	57.2	66.7
Level of Service	A	A		A	E	E
Approach Delay (s)	3.3			8.4	62.8	
Approach LOS	A			A	E	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

5: Research Park Boulevard/SW Natura Boulevard & SR 869/SW 10th Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	299	1587	261	283	1370	130	293	114	158	255	266	402
v/c Ratio	0.76	0.68	0.32	0.77	0.60	0.17	0.88	0.15	0.33	0.64	0.83	0.87
Control Delay	91.3	33.3	6.5	92.9	40.4	6.4	71.0	54.9	8.4	52.4	92.2	48.8
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.3	33.5	6.5	92.9	40.4	6.4	71.0	54.9	8.4	52.4	92.2	48.8
Queue Length 50th (ft)	167	401	34	169	453	4	266	57	0	226	308	215
Queue Length 95th (ft)	226	519	98	225	567	54	#368	82	60	283	393	340
Internal Link Dist (ft)		630			1233			1112			1327	
Turn Bay Length (ft)	300		300	200		300	260		260	170		170
Base Capacity (vph)	442	2325	826	392	2283	779	343	996	559	404	427	541
Starvation Cap Reductn	0	174	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.74	0.32	0.72	0.60	0.17	0.85	0.11	0.28	0.63	0.62	0.74

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

5: Research Park Boulevard/SW Natura Boulevard & SR 869/SW 10th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	275	1460	240	260	1260	120	270	105	145	235	245	370
Future Volume (vph)	275	1460	240	260	1260	120	270	105	145	235	245	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.4	4.4	4.4	4.4	4.4	5.7	5.7	5.7	5.7	5.7	5.7
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	1770	3539	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.18	1.00	1.00	0.68	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	331	3539	1583	1266	1863	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)	299	1587	261	283	1370	130	293	114	158	255	266	402
RTOR Reduction (vph)	0	0	103	0	0	68	0	0	123	0	0	191
Lane Group Flow (vph)	299	1587	158	283	1370	62	293	114	35	255	266	211
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2	4		4	8		8
Actuated Green, G (s)	18.7	80.3	80.3	17.2	78.8	78.8	64.0	39.9	39.9	49.5	31.1	31.1
Effective Green, g (s)	20.7	82.3	82.3	19.2	80.8	80.8	64.0	39.9	39.9	49.5	31.1	31.1
Actuated g/C Ratio	0.11	0.46	0.46	0.11	0.45	0.45	0.36	0.22	0.22	0.28	0.17	0.17
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	5.7	5.7	5.7	5.7	5.7	5.7
Vehicle Extension (s)	1.5	3.0	3.0	1.5	3.0	3.0	1.5	2.0	2.0	1.5	2.0	2.0
Lane Grp Cap (vph)	394	2324	723	366	2282	710	335	784	350	399	321	273
v/s Ratio Prot	c0.09	c0.31		0.08	0.27		c0.13	0.03		0.07	0.14	
v/s Ratio Perm			0.10			0.04	c0.18		0.02	0.11		0.13
v/c Ratio	0.76	0.68	0.22	0.77	0.60	0.09	0.87	0.15	0.10	0.64	0.83	0.77
Uniform Delay, d1	77.2	38.6	29.5	78.3	37.4	28.4	47.3	56.3	55.8	55.4	71.9	71.1
Progression Factor	1.05	0.79	0.58	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.1	0.7	0.1	8.9	1.2	0.2	20.9	0.0	0.0	2.5	15.3	11.7
Delay (s)	87.0	31.3	17.3	87.2	38.6	28.7	68.3	56.4	55.8	57.8	87.2	82.7
Level of Service	F	C	B	F	D	C	E	E	E	E	F	F
Approach Delay (s)		37.3			45.6			62.4			77.1	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	49.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	2522	261	2245	114	120
v/c Ratio	0.59	0.87	0.56	0.65	0.45
Control Delay	19.1	77.0	1.9	72.8	14.3
Queue Delay	0.0	52.4	0.2	0.0	0.0
Total Delay	19.2	129.4	2.1	72.8	14.3
Queue Length 50th (ft)	323	167	44	94	0
Queue Length 95th (ft)	389	#359	30	152	57
Internal Link Dist (ft)	575		175	531	
Turn Bay Length (ft)					
Base Capacity (vph)	4280	299	3992	503	536
Starvation Cap Reductn	0	62	690	0	0
Spillback Cap Reductn	112	0	0	0	1
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.61	1.10	0.68	0.23	0.22

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2240	80	240	2065	105	110
Future Volume (vph)	2240	80	240	2065	105	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	9.0	9.0
Lane Util. Factor	0.81		1.00	0.91	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	7505		1770	5085	1770	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	7505		1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2435	87	261	2245	114	120
RTOR Reduction (vph)	3	0	0	0	0	108
Lane Group Flow (vph)	2519	0	261	2245	114	12
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2 3		1	1 2 3	4	
Permitted Phases					4	4
Actuated Green, G (s)	72.1		20.0	100.1	12.9	12.9
Effective Green, g (s)	74.1		22.0	102.1	12.9	12.9
Actuated g/C Ratio	0.57		0.17	0.79	0.10	0.10
Clearance Time (s)			8.0		9.0	9.0
Vehicle Extension (s)			1.5		2.0	2.0
Lane Grp Cap (vph)	4277		299	3993	175	157
v/s Ratio Prot	c0.34		c0.15	0.44	c0.06	
v/s Ratio Perm						0.01
v/c Ratio	0.59		0.87	0.56	0.65	0.08
Uniform Delay, d1	18.1		52.6	5.4	56.4	53.1
Progression Factor	1.00		1.00	0.24	1.00	1.00
Incremental Delay, d2	0.1		19.5	0.1	6.5	0.1
Delay (s)	18.2		72.1	1.4	62.8	53.2
Level of Service	B		E	A	E	D
Approach Delay (s)	18.2			8.8	57.9	
Approach LOS	B			A	E	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	179	2375	2348	272	185	158
v/c Ratio	0.82	0.47	0.59	0.25	0.54	0.53
Control Delay	63.9	2.0	12.2	1.1	61.0	14.3
Queue Delay	6.0	0.1	0.0	0.0	0.0	0.1
Total Delay	69.9	2.0	12.2	1.1	61.0	14.4
Queue Length 50th (ft)	149	23	275	6	77	0
Queue Length 95th (ft)	#277	35	382	m23	112	64
Internal Link Dist (ft)		175	1004		271	
Turn Bay Length (ft)				450		
Base Capacity (vph)	217	5031	3947	1079	977	563
Starvation Cap Reductn	16	786	0	0	0	0
Spillback Cap Reductn	0	0	122	0	0	50
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.56	0.61	0.25	0.19	0.31

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	165	2185	2160	250	170	145
Future Volume (vph)	165	2185	2160	250	170	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	9.0	9.0
Lane Util. Factor	1.00	0.86	0.86	1.00	0.97	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	0.95	1.00
Satd. Flow (prot)	1770	6408	6408	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	6408	6408	1583	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	179	2375	2348	272	185	158
RTOR Reduction (vph)	0	0	0	104	0	142
Lane Group Flow (vph)	179	2375	2348	168	185	16
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	3	1 2 3	1 2		4	
Permitted Phases				1 2		4
Actuated Green, G (s)	14.0	100.1	78.1	78.1	12.9	12.9
Effective Green, g (s)	16.0	102.1	80.1	80.1	12.9	12.9
Actuated g/C Ratio	0.12	0.79	0.62	0.62	0.10	0.10
Clearance Time (s)	8.0				9.0	9.0
Vehicle Extension (s)	1.5				2.0	2.0
Lane Grp Cap (vph)	217	5032	3948	975	340	157
v/s Ratio Prot	c0.10	0.37	c0.37		c0.05	
v/s Ratio Perm				0.11		0.01
v/c Ratio	0.82	0.47	0.59	0.17	0.54	0.10
Uniform Delay, d1	55.6	4.8	15.1	10.7	55.8	53.3
Progression Factor	0.68	0.34	0.75	0.48	1.00	1.00
Incremental Delay, d2	17.8	0.0	0.1	0.0	1.0	0.1
Delay (s)	55.7	1.6	11.5	5.2	56.7	53.4
Level of Service	E	A	B	A	E	D
Approach Delay (s)		5.4	10.8		55.2	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	SBL2	SBR
Lane Group Flow (vph)	1897	642	1935	463	663
v/c Ratio	0.56	0.41	0.72	0.44	0.78
Control Delay	10.2	1.4	14.1	19.6	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	1.4	14.1	19.6	28.4
Queue Length 50th (ft)	177	4	259	73	131
Queue Length 95th (ft)	290	33	m226	111	#196
Internal Link Dist (ft)	1004		259		
Turn Bay Length (ft)		250			
Base Capacity (vph)	3379	1583	2681	1082	878
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.56	0.41	0.72	0.43	0.76

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑↑	↱		↑↑↑		↰↰		↱↱		
Traffic Volume (vph)	0	1745	610	0	1780	0	440	0	630	0	0
Future Volume (vph)	0	1745	610	0	1780	0	440	0	630	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	2.0		5.5		5.5		5.5		
Lane Util. Factor		0.86	1.00		0.91		0.97		0.88		
Frt		1.00	0.85		1.00		1.00		0.85		
Flt Protected		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (prot)		6408	1583		5085		3433		2787		
Flt Permitted		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (perm)		6408	1583		5085		3433		2787		
Peak-hour factor, PHF	0.92	0.92	0.95	0.92	0.92	0.92	0.95	0.92	0.95	0.92	0.92
Adj. Flow (vph)	0	1897	642	0	1935	0	463	0	663	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1897	642	0	1935	0	463	0	663	0	0
Turn Type		NA	Free		NA		Prot		Prot		
Protected Phases		6			2		3		3		
Permitted Phases			Free								
Actuated Green, G (s)		32.3	65.0		32.3		17.7		17.7		
Effective Green, g (s)		34.3	65.0		34.3		19.7		19.7		
Actuated g/C Ratio		0.53	1.00		0.53		0.30		0.30		
Clearance Time (s)		7.5			7.5		7.5		7.5		
Vehicle Extension (s)		3.0			3.0		2.5		2.5		
Lane Grp Cap (vph)		3381	1583		2683		1040		844		
v/s Ratio Prot		0.30			c0.38		0.13		c0.24		
v/s Ratio Perm			0.41								
v/c Ratio		0.56	0.41		0.72		0.45		0.79		
Uniform Delay, d1		10.3	0.0		11.7		18.2		20.7		
Progression Factor		0.91	1.00		1.09		1.00		1.00		
Incremental Delay, d2		0.6	0.7		1.1		0.2		4.7		
Delay (s)		10.0	0.7		13.8		18.5		25.4		
Level of Service		B	A		B		B		C		
Approach Delay (s)		7.7			13.8			22.5		0.0	
Approach LOS		A			B			C		A	

Intersection Summary			
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

Lane Group	EBT	WBT	WBR	NBL2	NBR
Lane Group Flow (vph)	1712	1707	347	1063	579
v/c Ratio	0.65	0.65	0.22	0.98	0.66
Control Delay	7.6	9.1	0.2	47.9	23.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.6	9.1	0.2	47.9	23.6
Queue Length 50th (ft)	56	127	0	212	110
Queue Length 95th (ft)	61	267	m0	#338	167
Internal Link Dist (ft)	270	1155			
Turn Bay Length (ft)			250		
Base Capacity (vph)	2620	2620	1583	1082	878
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.65	0.65	0.22	0.98	0.66

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Traffic Volume (vph)	0	1575	0	0	1570	330	1010	0	550	0	0
Future Volume (vph)	0	1575	0	0	1570	330	1010	0	550	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5	2.0	5.5		5.5		
Lane Util. Factor		0.91			0.91	1.00	0.97		0.88		
Frt		1.00			1.00	0.85	1.00		0.85		
Flt Protected		1.00			1.00	1.00	0.95		1.00		
Satd. Flow (prot)		5085			5085	1583	3433		2787		
Flt Permitted		1.00			1.00	1.00	0.95		1.00		
Satd. Flow (perm)		5085			5085	1583	3433		2787		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.92	0.95	0.92	0.92
Adj. Flow (vph)	0	1712	0	0	1707	347	1063	0	579	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1712	0	0	1707	347	1063	0	579	0	0
Turn Type		NA			NA	Free	Prot		Prot		
Protected Phases		6			2		4		4		
Permitted Phases						Free					
Actuated Green, G (s)		31.5			31.5	65.0	18.5		18.5		
Effective Green, g (s)		33.5			33.5	65.0	20.5		20.5		
Actuated g/C Ratio		0.52			0.52	1.00	0.32		0.32		
Clearance Time (s)		7.5			7.5		7.5		7.5		
Vehicle Extension (s)		3.0			3.0		2.5		2.5		
Lane Grp Cap (vph)		2620			2620	1583	1082		878		
v/s Ratio Prot		c0.34			0.34		c0.31		0.21		
v/s Ratio Perm						0.22					
v/c Ratio		0.65			0.65	0.22	0.98		0.66		
Uniform Delay, d1		11.5			11.5	0.0	22.1		19.2		
Progression Factor		0.56			0.71	1.00	1.00		1.00		
Incremental Delay, d2		1.1			0.8	0.2	23.0		1.6		
Delay (s)		7.5			9.0	0.2	45.1		20.8		
Level of Service		A			A	A	D		C		
Approach Delay (s)		7.5			7.5			36.5		0.0	
Approach LOS		A			A			D		A	

Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

5: NE 3rd Ave & Sample Road

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	467	1843	98	1582	228	326	98	71	255	375
v/c Ratio	0.87	0.75	0.75	0.77	0.90	0.74	0.19	0.39	0.78	0.79
Control Delay	66.8	24.1	91.2	36.9	74.0	56.2	0.8	38.2	67.2	30.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.8	24.1	91.2	36.9	74.0	56.2	0.8	38.2	67.2	30.4
Queue Length 50th (ft)	188	366	82	412	154	263	0	44	209	114
Queue Length 95th (ft)	#282	511	#173	#566	#245	339	0	73	280	219
Internal Link Dist (ft)		1155		834		912			742	
Turn Bay Length (ft)	550		490		250		225	200		
Base Capacity (vph)	549	2460	134	2056	252	539	600	183	454	565
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	0.85	0.75	0.73	0.77	0.90	0.60	0.16	0.39	0.56	0.66

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	430	1515	180	90	1345	110	210	300	90	65	235	345
Future Volume (vph)	430	1515	180	90	1345	110	210	300	90	65	235	345
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	4956		1752	4979		1752	1845	1568	1752	1845	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.25	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	3400	4956		1752	4979		468	1845	1568	659	1845	1568
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)	467	1647	196	98	1462	120	228	326	98	71	255	375
RTOR Reduction (vph)	0	10	0	0	7	0	0	0	74	0	0	194
Lane Group Flow (vph)	467	1833	0	98	1575	0	228	326	24	71	255	181
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	18.5	61.0		7.8	50.3		41.2	31.2	31.2	28.2	24.2	24.2
Effective Green, g (s)	20.5	63.0		9.8	52.3		41.2	31.2	31.2	28.2	24.2	24.2
Actuated g/C Ratio	0.16	0.48		0.08	0.40		0.32	0.24	0.24	0.22	0.19	0.19
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	1.5	3.0		1.5	3.0		1.5	2.0	2.0	1.5	2.0	2.0
Lane Grp Cap (vph)	536	2401		132	2003		256	442	376	176	343	291
v/s Ratio Prot	c0.14	c0.37		0.06	0.32		c0.08	0.18		0.01	0.14	
v/s Ratio Perm							c0.21		0.02	0.07		0.12
v/c Ratio	0.87	0.76		0.74	0.79		0.89	0.74	0.06	0.40	0.74	0.62
Uniform Delay, d1	53.5	27.4		58.9	34.0		39.0	45.6	38.1	42.4	50.0	48.7
Progression Factor	0.99	0.82		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.1	1.8		17.7	3.2		28.9	5.5	0.0	0.6	7.4	3.0
Delay (s)	64.0	24.2		76.6	37.2		67.9	51.1	38.1	42.9	57.4	51.7
Level of Service	E	C		E	D		E	D	D	D	E	D
Approach Delay (s)		32.3			39.5			55.0			52.9	
Approach LOS		C			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	40.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Queues

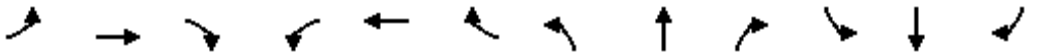
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	315	2289	370	1500	505	109	152	261	27	27	27
v/c Ratio	0.91	0.73	0.98	0.55	0.47	0.30	0.77	0.49	0.36	0.35	0.07
Control Delay	99.1	26.2	112.9	21.6	9.2	75.1	102.4	15.6	95.6	95.0	0.3
Queue Delay	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.1	26.2	112.9	21.9	9.4	75.1	102.4	15.6	95.6	95.0	0.3
Queue Length 50th (ft)	362	653	229	270	109	62	178	50	33	33	0
Queue Length 95th (ft)	#525	827	#346	303	116	93	255	136	72	72	1
Internal Link Dist (ft)		580		548			436			396	
Turn Bay Length (ft)	450		375		350	225		250	200		
Base Capacity (vph)	372	3122	379	2723	1215	610	331	536	252	257	426
Starvation Cap Reductn	0	0	0	479	173	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.73	0.98	0.67	0.48	0.18	0.46	0.49	0.11	0.11	0.06

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

1: SW 12th Avenue & Hillsboro Bvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	290	1915	190	340	1380	465	100	140	240	40	10	25
Future Volume (vph)	290	1915	190	340	1380	465	100	140	240	40	10	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.0	6.0	6.0	6.5	6.0	6.0	6.5
Lane Util. Factor	1.00	0.91		0.97	0.91	1.00	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (prot)	1770	5016		3433	5085	1583	3433	1863	1583	1681	1719	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1770	5016		3433	5085	1583	3433	1863	1583	1681	1719	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)	315	2082	207	370	1500	505	109	152	261	43	11	27
RTOR Reduction (vph)	0	5	0	0	0	107	0	0	165	0	0	21
Lane Group Flow (vph)	315	2284	0	370	1500	398	109	152	96	27	27	6
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	1	6		5	2	3	4	4	5	3	3	1
Permitted Phases						2			4			3
Actuated Green, G (s)	33.4	109.9		17.9	94.4	102.5	19.1	19.1	37.0	8.1	8.1	41.5
Effective Green, g (s)	35.4	111.9		19.9	96.4	106.5	19.1	19.1	37.0	8.1	8.1	41.5
Actuated g/C Ratio	0.20	0.62		0.11	0.54	0.59	0.11	0.11	0.21	0.04	0.04	0.23
Clearance Time (s)	6.5	6.5		6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Vehicle Extension (s)	1.5	3.0		2.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	1.5
Lane Grp Cap (vph)	348	3118		379	2723	936	364	197	325	75	77	364
v/s Ratio Prot	c0.18	c0.46		0.11	0.29	c0.02	0.03	c0.08	0.03	0.02	0.02	0.00
v/s Ratio Perm						0.23			0.03			0.00
v/c Ratio	0.91	0.73		0.98	0.55	0.43	0.30	0.77	0.29	0.36	0.35	0.02
Uniform Delay, d1	70.7	23.7		79.8	27.5	20.1	74.3	78.3	60.5	83.4	83.4	53.5
Progression Factor	1.00	1.00		0.98	0.72	0.89	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	25.4	1.6		35.5	0.7	0.1	0.2	15.5	0.2	1.1	1.0	0.0
Delay (s)	96.0	25.2		113.6	20.6	17.9	74.4	93.9	60.6	84.5	84.4	53.5
Level of Service	F	C		F	C	B	E	F	E	F	F	D
Approach Delay (s)		33.8			34.5			73.2			74.1	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	38.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Queues

Lane Group	EBT	EBR	WBT	SBL2	SBR
Lane Group Flow (vph)	1462	895	1495	642	853
v/c Ratio	0.29	0.57	0.58	0.82	0.69
Control Delay	0.1	4.8	27.1	52.7	42.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.1	4.8	27.1	52.7	42.9
Queue Length 50th (ft)	0	104	476	661	458
Queue Length 95th (ft)	0	190	529	693	448
Internal Link Dist (ft)	548		319		
Turn Bay Length (ft)		150			
Base Capacity (vph)	5085	1583	2585	948	1494
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.29	0.57	0.58	0.68	0.57

Intersection Summary

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑	↱		↑↑↑		↰		↱↱		
Traffic Volume (vph)	0	1345	850	0	1375	0	610	0	810	0	0
Future Volume (vph)	0	1345	850	0	1375	0	610	0	810	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		2.0	2.0		4.5		4.5		4.5		
Lane Util. Factor		0.91	1.00		0.91		1.00		0.88		
Frt		1.00	0.85		1.00		1.00		0.85		
Flt Protected		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (prot)		5085	1583		5085		1770		2787		
Flt Permitted		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (perm)		5085	1583		5085		1770		2787		
Peak-hour factor, PHF	0.92	0.92	0.95	0.92	0.92	0.92	0.95	0.92	0.95	0.92	0.92
Adj. Flow (vph)	0	1462	895	0	1495	0	642	0	853	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1462	895	0	1495	0	642	0	853	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA	Perm		NA		Prot		Prot		
Protected Phases		Free!			2		8!		3		
Permitted Phases			Free								
Actuated Green, G (s)		180.0	180.0		89.5		77.5		77.5		
Effective Green, g (s)		180.0	180.0		91.5		79.5		79.5		
Actuated g/C Ratio		1.00	1.00		0.51		0.44		0.44		
Clearance Time (s)					6.5		6.5		6.5		
Vehicle Extension (s)					3.0		2.5		2.5		
Lane Grp Cap (vph)		5085	1583		2584		781		1230		
v/s Ratio Prot		0.29			0.29		c0.36		0.31		
v/s Ratio Perm			c0.57								
v/c Ratio		0.29	0.57		0.58		0.82		0.69		
Uniform Delay, d1		0.0	0.0		30.8		44.0		40.4		
Progression Factor		1.00	1.00		0.80		1.00		1.00		
Incremental Delay, d2		0.1	1.0		0.8		6.8		1.6		
Delay (s)		0.1	1.0		25.6		50.9		42.0		
Level of Service		A	A		C		D		D		
Approach Delay (s)		0.5			25.6			45.8		0.0	
Approach LOS		A			C			D		A	

Intersection Summary			
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.

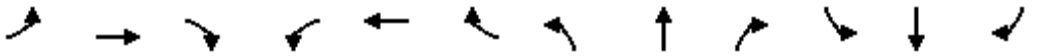
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	1495	1734	880	576	842
v/c Ratio	0.54	0.63	0.56	0.30	0.77
Control Delay	13.0	13.4	2.7	19.3	28.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	13.4	2.7	19.3	28.0
Queue Length 50th (ft)	243	393	58	76	215
Queue Length 95th (ft)	219	m302	m10	98	282
Internal Link Dist (ft)	286	371			
Turn Bay Length (ft)			250	350	350
Base Capacity (vph)	2769	2769	1568	2106	1201
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.54	0.63	0.56	0.27	0.70

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1375	0	0	1595	810	530	0	800	0	0	0
Future Volume (vph)	0	1375	0	0	1595	810	530	0	800	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5	2.0	2.0		2.0			
Lane Util. Factor		0.91			0.91	1.00	0.94		0.88			
Frt		1.00			1.00	0.85	1.00		0.85			
Flt Protected		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085			5085	1568	4990		2787			
Flt Permitted		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085			5085	1568	4990		2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.92	0.92	0.92
Adj. Flow (vph)	0	1495	0	0	1734	880	576	0	842	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	26	0	0	0
Lane Group Flow (vph)	0	1495	0	0	1734	880	576	0	816	0	0	0
Heavy Vehicles (%)	3%	2%	2%	2%	2%	3%	2%	3%	2%	3%	3%	3%
Turn Type		NA			NA	Free	Prot		Prot			
Protected Phases		6			2		4		4			
Permitted Phases						Free						
Actuated Green, G (s)		47.0			47.0	90.0	32.5		32.5			
Effective Green, g (s)		49.0			49.0	90.0	34.5		34.5			
Actuated g/C Ratio		0.54			0.54	1.00	0.38		0.38			
Clearance Time (s)		6.5			6.5		4.0		4.0			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		2768			2768	1568	1912		1068			
v/s Ratio Prot		0.29			c0.34		0.12		c0.29			
v/s Ratio Perm						0.56						
v/c Ratio		0.54			0.63	0.56	0.30		0.76			
Uniform Delay, d1		13.2			14.2	0.0	19.3		24.2			
Progression Factor		0.89			0.87	1.00	1.00		1.00			
Incremental Delay, d2		0.7			0.6	0.8	0.1		3.3			
Delay (s)		12.5			12.9	0.8	19.4		27.5			
Level of Service		B			B	A	B		C			
Approach Delay (s)		12.5			8.8			24.2			0.0	
Approach LOS		B			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.5
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Queues

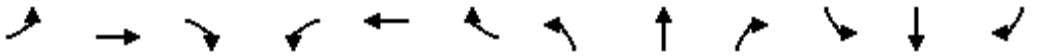
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	342	1891	130	87	2038	103	484	92	174	43	5	92
v/c Ratio	0.92	0.58	0.12	0.76	0.67	0.10	1.64	0.31	0.44	0.52	0.08	0.42
Control Delay	94.9	19.4	2.5	117.7	25.1	0.2	340.1	70.9	14.1	87.2	87.0	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.9	19.4	2.5	117.7	25.1	0.2	340.1	70.9	14.1	87.2	87.0	5.7
Queue Length 50th (ft)	198	460	19	103	567	0	~757	99	9	42	6	0
Queue Length 95th (ft)	#304	485	m30	#195	614	0	#991	163	87	82	22	0
Internal Link Dist (ft)		660			631			513			403	
Turn Bay Length (ft)	300		150	100		200	125					340
Base Capacity (vph)	371	3280	1067	120	3064	1021	296	610	629	82	393	470
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.58	0.12	0.72	0.67	0.10	1.64	0.15	0.28	0.52	0.01	0.20

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	1740	120	80	1875	95	445	85	160	40	5	85
Future Volume (vph)	315	1740	120	80	1875	95	445	85	160	40	5	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.41	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	767	1863	1583	1299	1863	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)	342	1891	130	87	2038	103	484	92	174	43	5	92
RTOR Reduction (vph)	0	0	47	0	0	42	0	0	138	0	0	88
Lane Group Flow (vph)	342	1891	83	87	2038	61	484	92	36	43	5	4
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2	4		4	8		8
Actuated Green, G (s)	17.5	113.0	113.0	9.8	105.3	105.3	38.2	29.0	29.0	10.4	7.2	7.2
Effective Green, g (s)	19.5	115.0	115.0	11.8	107.3	107.3	38.2	29.0	29.0	10.4	7.2	7.2
Actuated g/C Ratio	0.11	0.64	0.64	0.07	0.60	0.60	0.21	0.16	0.16	0.06	0.04	0.04
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.0	3.0	3.0	1.5	3.0	3.0	1.5	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	371	3248	1011	116	3031	943	302	300	255	83	74	63
v/s Ratio Prot	c0.10	0.37		0.05	c0.40		c0.22	0.05		0.01	0.00	
v/s Ratio Perm			0.05			0.04	c0.12		0.02	0.02		0.00
v/c Ratio	0.92	0.58	0.08	0.75	0.67	0.07	1.60	0.31	0.14	0.52	0.07	0.06
Uniform Delay, d1	79.5	18.7	12.4	82.7	24.5	15.3	68.4	66.6	64.8	81.9	83.2	83.1
Progression Factor	0.87	1.03	1.35	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.7	0.6	0.1	21.2	1.2	0.1	286.2	0.2	0.1	2.3	0.1	0.1
Delay (s)	92.9	19.9	16.9	103.8	25.7	15.4	354.6	66.8	64.9	84.2	83.3	83.3
Level of Service	F	B	B	F	C	B	F	E	E	F	F	F
Approach Delay (s)		30.3			28.3			252.1			83.6	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM 2000 Control Delay	61.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	408	1565	207	370	1125	625	217	734	712	522	609	326
v/c Ratio	0.86	1.09	0.24	0.68	0.75	0.65	0.79	1.16	1.09	1.09	0.72	0.57
Control Delay	94.0	101.7	10.3	88.8	37.9	18.3	101.3	151.6	104.1	137.1	69.0	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.0	101.7	10.3	88.8	37.9	18.3	101.3	151.6	104.1	137.1	69.0	16.8
Queue Length 50th (ft)	246	~1090	51	237	336	209	131	~538	~850	~356	353	61
Queue Length 95th (ft)	#324	#1225	105	296	478	245	#193	#674	#1109	#480	428	172
Internal Link Dist (ft)		620			1001			569			457	
Turn Bay Length (ft)	550		500	550		500	300		300	650		650
Base Capacity (vph)	486	1435	865	543	1507	961	278	631	656	478	841	575
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	1.09	0.24	0.68	0.75	0.65	0.78	1.16	1.09	1.09	0.72	0.57

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

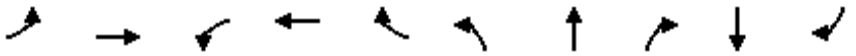
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	375	1440	190	340	1035	575	200	675	655	480	560	300
Future Volume (vph)	375	1440	190	340	1035	575	200	675	655	480	560	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.9	5.5	4.0	5.9	5.9	5.9	5.5	5.9	5.9	5.9
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	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)	408	1565	207	370	1125	625	217	734	712	522	609	326
RTOR Reduction (vph)	0	0	63	0	0	33	0	0	76	0	0	200
Lane Group Flow (vph)	408	1565	144	370	1125	592	217	734	636	522	609	126
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	
Permitted Phases			6			2			4			8
Actuated Green, G (s)	22.8	71.0	83.4	26.5	74.7	97.8	12.4	30.1	56.6	23.1	40.8	40.8
Effective Green, g (s)	24.8	73.0	87.4	28.5	76.7	101.8	14.4	32.1	60.6	25.1	42.8	42.8
Actuated g/C Ratio	0.14	0.41	0.49	0.16	0.43	0.57	0.08	0.18	0.34	0.14	0.24	0.24
Clearance Time (s)	7.5	6.0	7.9	7.5	6.0	7.9	7.9	7.9	7.5	7.9	7.9	7.9
Vehicle Extension (s)	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	3.0
Lane Grp Cap (vph)	472	1435	768	543	1508	895	274	631	532	478	841	376
v/s Ratio Prot	0.12	c0.44	0.01	0.11	c0.32	0.09	0.06	0.21	c0.19	c0.15	0.17	
v/s Ratio Perm			0.08			0.28			0.21			0.08
v/c Ratio	0.86	1.09	0.19	0.68	0.75	0.66	0.79	1.16	1.20	1.09	0.72	0.34
Uniform Delay, d1	76.0	53.5	26.2	71.5	43.5	27.2	81.3	74.0	59.7	77.5	63.2	56.8
Progression Factor	1.00	1.00	1.00	1.16	0.80	0.71	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.7	52.5	0.0	2.2	2.6	1.1	13.5	90.0	105.5	68.5	3.1	0.5
Delay (s)	90.6	106.0	26.2	85.3	37.5	20.4	94.9	164.0	165.2	145.9	66.3	57.4
Level of Service	F	F	C	F	D	C	F	F	F	F	E	E
Approach Delay (s)		95.5			40.8			155.5			92.8	
Approach LOS		F			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	92.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	106.9%	ICU Level of Service	G
Analysis Period (min)	15		

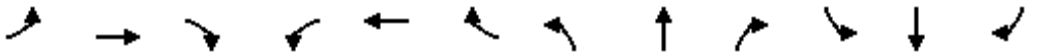
c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	397	2402	446	1902	386	54	55	130	60	120
v/c Ratio	0.62	0.68	0.78	0.68	0.38	0.38	0.39	0.26	0.57	0.19
Control Delay	54.3	17.1	85.3	25.2	3.1	86.4	86.5	16.7	101.6	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.3	17.1	85.3	25.2	3.1	86.4	86.5	16.7	101.6	14.2
Queue Length 50th (ft)	215	321	262	455	26	65	66	33	70	13
Queue Length 95th (ft)	m198	m396	324	511	64	118	122	89	123	44
Internal Link Dist (ft)		900		925			695		185	
Turn Bay Length (ft)	700		750		700			150		
Base Capacity (vph)	646	3555	686	2786	1009	158	160	515	141	666
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	0.61	0.68	0.65	0.68	0.38	0.34	0.34	0.25	0.43	0.18

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

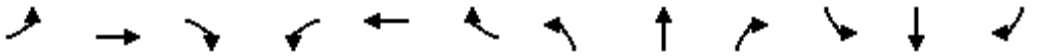


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	365	1660	550	410	1750	355	90	10	120	45	10	110
Future Volume (vph)	365	1660	550	410	1750	355	90	10	120	45	10	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	0.97	0.86		0.97	0.91	1.00	0.95	0.95	1.00		1.00	0.88
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	3367	6169		3433	5085	1524	1681	1702	1583		1586	2030
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	3367	6169		3433	5085	1524	1681	1702	1583		1586	2030
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)	397	1804	598	446	1902	386	98	11	130	49	11	120
RTOR Reduction (vph)	0	29	0	0	0	175	0	0	68	0	0	66
Lane Group Flow (vph)	397	2373	0	446	1902	211	54	55	62	0	60	54
Heavy Vehicles (%)	4%	2%	2%	2%	2%	6%	2%	2%	2%	18%	2%	40%
Turn Type	Prot	NA		Prot	NA	Prot	Split	NA	pt+ov	Split	NA	pt+ov
Protected Phases	1	6		5	2	2	3	3	3 5	4	4	4 1
Permitted Phases												
Actuated Green, G (s)	32.4	100.9		28.1	96.6	96.6	15.1	15.1	49.2		11.9	50.3
Effective Green, g (s)	34.4	102.9		30.1	98.6	98.6	15.1	15.1	49.2		11.9	50.3
Actuated g/C Ratio	0.19	0.57		0.17	0.55	0.55	0.08	0.08	0.27		0.07	0.28
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	1.5	3.0		2.5	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	643	3526		574	2785	834	141	142	432		104	567
v/s Ratio Prot	0.12	c0.38		c0.13	c0.37	0.14	0.03	c0.03	0.04		c0.04	0.03
v/s Ratio Perm												
v/c Ratio	0.62	0.67		0.78	0.68	0.25	0.38	0.39	0.14		0.58	0.09
Uniform Delay, d1	66.8	26.8		71.7	29.4	21.4	78.0	78.1	49.5		81.6	48.0
Progression Factor	0.80	0.63		1.09	0.81	1.25	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.1		4.8	1.0	0.6	1.7	1.8	0.2		7.5	0.1
Delay (s)	53.7	16.9		82.8	24.7	27.3	79.8	79.8	49.6		89.1	48.1
Level of Service	D	B		F	C	C	E	E	D		F	D
Approach Delay (s)		22.1			34.6			63.4			61.8	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	1970	847	2125	453	589
v/c Ratio	0.85	0.76	0.61	0.49	0.78
Control Delay	39.5	37.4	26.4	57.4	69.3
Queue Delay	0.0	0.0	0.3	0.0	0.0
Total Delay	39.5	37.4	26.7	57.4	69.3
Queue Length 50th (ft)	500	331	662	234	369
Queue Length 95th (ft)	410	401	736	293	454
Internal Link Dist (ft)	925		322		
Turn Bay Length (ft)		500		500	500
Base Capacity (vph)	2328	1125	3460	926	752
Starvation Cap Reductn	0	0	551	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.85	0.75	0.73	0.49	0.78

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1440	385	805	1955	0	0	0	0	430	0	560
Future Volume (vph)	0	1440	385	805	1955	0	0	0	0	430	0	560
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.5					4.4		4.4
Lane Util. Factor		0.81		0.97	0.91					0.97		0.88
Frt		0.97		1.00	1.00					1.00		0.85
Flt Protected		1.00		0.95	1.00					0.95		1.00
Satd. Flow (prot)		7311		3433	5085					3433		2787
Flt Permitted		1.00		0.95	1.00					0.95		1.00
Satd. Flow (perm)		7311		3433	5085					3433		2787
Peak-hour factor, PHF	0.92	0.92	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	0	1565	405	847	2125	0	0	0	0	453	0	589
RTOR Reduction (vph)	0	26	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1944	0	847	2125	0	0	0	0	453	0	589
Turn Type		NA		Prot	NA					Prot		Prot
Protected Phases		6		5 4	2 4					3		3
Permitted Phases												
Actuated Green, G (s)		54.7		53.9	120.6					46.6		46.6
Effective Green, g (s)		56.7		57.9	122.6					48.6		48.6
Actuated g/C Ratio		0.32		0.32	0.68					0.27		0.27
Clearance Time (s)		6.0								6.4		6.4
Vehicle Extension (s)		3.0								2.0		2.0
Lane Grp Cap (vph)		2302		1104	3463					926		752
v/s Ratio Prot		c0.27		c0.25	0.42					0.13		c0.21
v/s Ratio Perm												
v/c Ratio		0.84		0.77	0.61					0.49		0.78
Uniform Delay, d1		57.5		55.0	15.7					55.3		60.8
Progression Factor		0.64		1.20	1.62					1.00		1.00
Incremental Delay, d2		3.1		2.8	0.3					0.1		4.9
Delay (s)		40.0		68.8	25.7					55.4		65.8
Level of Service		D		E	C					E		E
Approach Delay (s)		40.0			38.0			0.0			61.3	
Approach LOS		D			D			A			E	

Intersection Summary			
HCM 2000 Control Delay	42.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	NBL	NBR
Lane Group Flow (vph)	1565	453	2533	758	495
v/c Ratio	0.52	0.16	0.44	0.81	0.74
Control Delay	4.7	0.1	16.1	78.2	76.4
Queue Delay	0.0	0.0	0.5	0.0	0.0
Total Delay	4.7	0.1	16.6	78.2	76.4
Queue Length 50th (ft)	53	0	558	308	245
Queue Length 95th (ft)	114	m0	589	361	303
Internal Link Dist (ft)	233		630	1225	
Turn Bay Length (ft)		700		410	430
Base Capacity (vph)	2986	2787	5762	931	673
Starvation Cap Reductn	8	0	2519	0	0
Spillback Cap Reductn	7	0	391	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.53	0.16	0.78	0.81	0.74

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1440	430	0	2330	720	470
Future Volume (vph)	1440	430	0	2330	720	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	2.0		4.5	4.4	4.4
Lane Util. Factor	0.91	0.88		0.81	0.94	0.76
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	5085	2787		7544	4990	3610
Flt Permitted	1.00	1.00		1.00	0.95	1.00
Satd. Flow (perm)	5085	2787		7544	4990	3610
Peak-hour factor, PHF	0.92	0.95	0.92	0.92	0.95	0.95
Adj. Flow (vph)	1565	453	0	2533	758	495
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1565	453	0	2533	758	495
Turn Type	NA	Free		NA	Prot	Prot
Protected Phases	6 3			2 3	4	4
Permitted Phases		Free				
Actuated Green, G (s)	101.3	180.0		135.5	31.6	31.6
Effective Green, g (s)	105.3	180.0		133.1	33.6	33.6
Actuated g/C Ratio	0.58	1.00		0.74	0.19	0.19
Clearance Time (s)					6.4	6.4
Vehicle Extension (s)					3.5	3.5
Lane Grp Cap (vph)	2974	2787		5578	931	673
v/s Ratio Prot	c0.31			c0.34	c0.15	0.14
v/s Ratio Perm		0.16				
v/c Ratio	0.53	0.16		0.45	0.81	0.74
Uniform Delay, d1	22.4	0.0		9.2	70.2	69.0
Progression Factor	0.38	1.00		2.10	1.00	1.00
Incremental Delay, d2	0.0	0.1		0.0	5.7	4.3
Delay (s)	8.5	0.1		19.4	75.9	73.3
Level of Service	A	A		B	E	E
Approach Delay (s)	6.6			19.4	74.9	
Approach LOS	A			B	E	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		

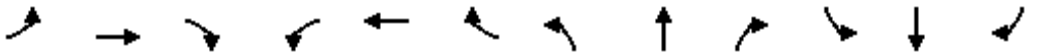
c Critical Lane Group

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	277	1457	342	228	1728	103	380	212	196	266	217	424
v/c Ratio	0.81	0.64	0.40	0.71	0.78	0.13	0.91	0.26	0.38	0.67	0.68	0.95
Control Delay	80.2	27.1	11.4	91.8	47.4	3.0	69.9	55.7	7.9	49.8	79.8	68.1
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.2	27.2	11.4	91.8	47.4	3.0	69.9	55.7	7.9	49.8	79.8	68.1
Queue Length 50th (ft)	170	529	158	136	657	0	344	106	0	223	239	273
Queue Length 95th (ft)	#230	576	204	186	752	27	#454	142	67	293	328	#446
Internal Link Dist (ft)		630			1233			1112			1327	
Turn Bay Length (ft)	300		300	200		300	260		260	170		170
Base Capacity (vph)	354	2263	856	352	2229	763	420	961	572	411	396	502
Starvation Cap Reductn	0	176	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.70	0.40	0.65	0.78	0.13	0.90	0.22	0.34	0.65	0.55	0.84

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	255	1340	315	210	1590	95	350	195	180	245	200	390
Future Volume (vph)	255	1340	315	210	1590	95	350	195	180	245	200	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.4	4.4	4.4	4.4	4.4	5.7	5.7	5.7	5.7	5.7	5.7
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	1770	3539	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.27	1.00	1.00	0.62	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	512	3539	1583	1153	1863	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)	277	1457	342	228	1728	103	380	212	196	266	217	424
RTOR Reduction (vph)	0	0	152	0	0	58	0	0	150	0	0	174
Lane Group Flow (vph)	277	1457	190	228	1728	45	380	212	46	266	217	250
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2	4		4	8		8
Actuated Green, G (s)	16.0	78.1	78.1	14.8	76.9	76.9	68.6	42.3	42.3	51.5	30.9	30.9
Effective Green, g (s)	18.0	80.1	80.1	16.8	78.9	78.9	68.6	42.3	42.3	51.5	30.9	30.9
Actuated g/C Ratio	0.10	0.44	0.44	0.09	0.44	0.44	0.38	0.23	0.23	0.29	0.17	0.17
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	5.7	5.7	5.7	5.7	5.7	5.7
Vehicle Extension (s)	1.5	3.0	3.0	1.5	3.0	3.0	1.5	2.0	2.0	1.5	2.0	2.0
Lane Grp Cap (vph)	343	2262	704	320	2228	693	418	831	372	400	319	271
v/s Ratio Prot	c0.08	0.29		0.07	c0.34		c0.16	0.06		0.08	0.12	
v/s Ratio Perm			0.12			0.03	c0.18		0.03	0.11		0.16
v/c Ratio	0.81	0.64	0.27	0.71	0.78	0.07	0.91	0.26	0.12	0.67	0.68	0.92
Uniform Delay, d1	79.3	38.9	31.5	79.3	43.0	29.2	45.6	56.0	54.2	54.0	69.9	73.4
Progression Factor	0.82	0.64	1.30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.4	1.2	0.8	6.1	1.8	0.0	22.7	0.1	0.1	3.2	4.7	34.2
Delay (s)	75.2	26.0	41.8	85.4	44.8	29.3	68.3	56.1	54.3	57.2	74.6	107.6
Level of Service	E	C	D	F	D	C	E	E	D	E	E	F
Approach Delay (s)		35.2			48.5			61.5			84.9	
Approach LOS		D			D			E			F	

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)	180.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	2549	174	1946	158	207
v/c Ratio	0.60	0.79	0.51	0.69	0.54
Control Delay	17.9	77.9	1.9	64.9	11.3
Queue Delay	0.0	1.5	0.1	0.0	0.0
Total Delay	17.9	79.4	2.0	64.9	11.3
Queue Length 50th (ft)	297	103	34	119	0
Queue Length 95th (ft)	376	#237	32	181	65
Internal Link Dist (ft)	575		175	531	
Turn Bay Length (ft)					
Base Capacity (vph)	4279	221	3791	545	631
Starvation Cap Reductn	0	7	458	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.60	0.81	0.58	0.29	0.33

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2230	115	160	1790	145	190
Future Volume (vph)	2230	115	160	1790	145	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	9.0	9.0
Lane Util. Factor	0.81		1.00	0.91	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	7489		1770	5085	1770	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	7489		1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2424	125	174	1946	158	207
RTOR Reduction (vph)	5	0	0	0	0	180
Lane Group Flow (vph)	2544	0	174	1946	158	27
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2 3		1	1 2 3	4	
Permitted Phases					4	4
Actuated Green, G (s)	66.5		13.0	87.5	15.5	15.5
Effective Green, g (s)	68.5		15.0	89.5	15.5	15.5
Actuated g/C Ratio	0.57		0.12	0.75	0.13	0.13
Clearance Time (s)			8.0		9.0	9.0
Vehicle Extension (s)			1.5		2.0	2.0
Lane Grp Cap (vph)	4274		221	3792	228	204
v/s Ratio Prot	c0.34		c0.10	0.38	c0.09	
v/s Ratio Perm						0.02
v/c Ratio	0.60		0.79	0.51	0.69	0.13
Uniform Delay, d1	16.7		51.0	6.3	50.0	46.3
Progression Factor	1.00		1.09	0.22	1.00	1.00
Incremental Delay, d2	0.1		14.1	0.0	7.1	0.1
Delay (s)	16.9		69.5	1.4	57.1	46.4
Level of Service	B		E	A	E	D
Approach Delay (s)	16.9			7.0	51.0	
Approach LOS	B			A	D	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	103	2527	1940	92	272	179
v/c Ratio	0.78	0.53	0.49	0.09	0.61	0.53
Control Delay	70.9	2.7	10.6	1.2	54.8	15.9
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	70.9	2.7	10.6	1.2	54.8	15.9
Queue Length 50th (ft)	79	29	222	1	104	17
Queue Length 95th (ft)	m#173	46	278	m5	140	81
Internal Link Dist (ft)		175	1004		271	
Turn Bay Length (ft)				450		
Base Capacity (vph)	132	4778	3977	1017	1058	595
Starvation Cap Reductn	0	476	0	0	0	0
Spillback Cap Reductn	0	0	39	0	0	5
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.59	0.49	0.09	0.26	0.30

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	95	2325	1785	85	250	165
Future Volume (vph)	95	2325	1785	85	250	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	9.0	9.0
Lane Util. Factor	1.00	0.86	0.86	1.00	0.97	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	0.95	1.00
Satd. Flow (prot)	1770	6408	6408	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	6408	6408	1583	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	2527	1940	92	272	179
RTOR Reduction (vph)	0	0	0	35	0	135
Lane Group Flow (vph)	103	2527	1940	57	272	44
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	3	1 2 3	1 2		4	
Permitted Phases				1 2		4
Actuated Green, G (s)	7.0	87.5	72.5	72.5	15.5	15.5
Effective Green, g (s)	9.0	89.5	74.5	74.5	15.5	15.5
Actuated g/C Ratio	0.08	0.75	0.62	0.62	0.13	0.13
Clearance Time (s)	8.0				9.0	9.0
Vehicle Extension (s)	1.5				2.0	2.0
Lane Grp Cap (vph)	132	4779	3978	982	443	204
v/s Ratio Prot	c0.06	c0.39	0.30		c0.08	
v/s Ratio Perm				0.04		0.03
v/c Ratio	0.78	0.53	0.49	0.06	0.61	0.22
Uniform Delay, d1	54.5	6.4	12.4	8.9	49.4	46.8
Progression Factor	0.71	0.34	0.79	0.47	1.00	1.00
Incremental Delay, d2	19.9	0.0	0.0	0.0	1.8	0.2
Delay (s)	58.4	2.2	9.8	4.2	51.2	47.0
Level of Service	E	A	A	A	D	D
Approach Delay (s)		4.4	9.5		49.5	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	SBL2	SBR
Lane Group Flow (vph)	1701	1063	1457	505	558
v/c Ratio	0.47	0.67	0.51	0.58	0.79
Control Delay	6.0	10.4	7.7	22.7	30.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.0	10.4	7.7	22.7	30.9
Queue Length 50th (ft)	84	362	135	81	106
Queue Length 95th (ft)	157	466	160	123	#182
Internal Link Dist (ft)	1004		259		
Turn Bay Length (ft)		250			
Base Capacity (vph)	3609	1583	2864	886	719
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.47	0.67	0.51	0.57	0.78

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑↑	↱		↑↑↑		↰↰		↱↱		
Traffic Volume (vph)	0	1565	1010	0	1340	0	480	0	530	0	0
Future Volume (vph)	0	1565	1010	0	1340	0	480	0	530	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	2.0		5.5		5.5		5.5		
Lane Util. Factor		0.86	1.00		0.91		0.97		0.88		
Frt		1.00	0.85		1.00		1.00		0.85		
Flt Protected		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (prot)		6408	1583		5085		3433		2787		
Flt Permitted		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (perm)		6408	1583		5085		3433		2787		
Peak-hour factor, PHF	0.92	0.92	0.95	0.92	0.92	0.92	0.95	0.92	0.95	0.92	0.92
Adj. Flow (vph)	0	1701	1063	0	1457	0	505	0	558	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1701	1063	0	1457	0	505	0	558	0	0
Turn Type		NA	Free		NA		Prot		Prot		
Protected Phases		6			2		3		3		
Permitted Phases			Free								
Actuated Green, G (s)		31.8	60.0		31.8		13.2		13.2		
Effective Green, g (s)		33.8	60.0		33.8		15.2		15.2		
Actuated g/C Ratio		0.56	1.00		0.56		0.25		0.25		
Clearance Time (s)		7.5			7.5		7.5		7.5		
Vehicle Extension (s)		3.0			3.0		2.5		2.5		
Lane Grp Cap (vph)		3609	1583		2864		869		706		
v/s Ratio Prot		0.27			0.29		0.15		0.20		
v/s Ratio Perm			c0.67								
v/c Ratio		0.47	0.67		0.51		0.58		0.79		
Uniform Delay, d1		7.8	0.0		8.0		19.6		20.9		
Progression Factor		0.72	1.00		0.89		1.00		1.00		
Incremental Delay, d2		0.4	2.0		0.5		0.8		5.8		
Delay (s)		6.0	2.0		7.6		20.4		26.7		
Level of Service		A	A		A		C		C		
Approach Delay (s)		4.5			7.6			23.7		0.0	
Approach LOS		A			A			C		A	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL2	NBR
Lane Group Flow (vph)	1266	1913	600	579	442
v/c Ratio	0.44	0.66	0.38	0.68	0.64
Control Delay	6.5	7.2	0.2	25.0	24.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	7.2	0.2	25.0	24.9
Queue Length 50th (ft)	111	159	0	95	79
Queue Length 95th (ft)	75	m157	m0	143	126
Internal Link Dist (ft)	270	1155			
Turn Bay Length (ft)			250		
Base Capacity (vph)	2895	2895	1583	886	719
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.44	0.66	0.38	0.65	0.61

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Traffic Volume (vph)	0	1165	0	0	1760	570	550	0	420	0	0
Future Volume (vph)	0	1165	0	0	1760	570	550	0	420	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5	2.0	5.5		5.5		
Lane Util. Factor		0.91			0.91	1.00	0.97		0.88		
Frt		1.00			1.00	0.85	1.00		0.85		
Flt Protected		1.00			1.00	1.00	0.95		1.00		
Satd. Flow (prot)		5085			5085	1583	3433		2787		
Flt Permitted		1.00			1.00	1.00	0.95		1.00		
Satd. Flow (perm)		5085			5085	1583	3433		2787		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.92	0.95	0.92	0.92
Adj. Flow (vph)	0	1266	0	0	1913	600	579	0	442	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1266	0	0	1913	600	579	0	442	0	0
Turn Type		NA			NA	Free	Prot		Prot		
Protected Phases		6			2		4		4		
Permitted Phases						Free					
Actuated Green, G (s)		32.2			32.2	60.0	12.8		12.8		
Effective Green, g (s)		34.2			34.2	60.0	14.8		14.8		
Actuated g/C Ratio		0.57			0.57	1.00	0.25		0.25		
Clearance Time (s)		7.5			7.5		7.5		7.5		
Vehicle Extension (s)		3.0			3.0		2.5		2.5		
Lane Grp Cap (vph)		2898			2898	1583	846		687		
v/s Ratio Prot		0.25			c0.38		c0.17		0.16		
v/s Ratio Perm						0.38					
v/c Ratio		0.44			0.66	0.38	0.68		0.64		
Uniform Delay, d1		7.4			8.9	0.0	20.5		20.2		
Progression Factor		0.80			0.75	1.00	1.00		1.00		
Incremental Delay, d2		0.4			0.3	0.2	2.1		1.8		
Delay (s)		6.3			7.0	0.2	22.6		22.1		
Level of Service		A			A	A	C		C		
Approach Delay (s)		6.3			5.4			22.4		0.0	
Approach LOS		A			A			C		A	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

5: NE 3rd Ave & Sample Road

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	424	1299	60	1804	250	228	82	109	223	571
v/c Ratio	1.00	0.59	0.48	0.98	0.72	0.45	0.15	0.32	0.45	1.06
Control Delay	88.0	20.3	66.9	54.9	44.6	39.3	0.6	28.9	40.3	87.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.0	20.3	66.9	54.9	44.6	39.3	0.6	28.9	40.3	87.5
Queue Length 50th (ft)	168	247	45	500	140	146	0	56	144	~388
Queue Length 95th (ft)	#280	299	91	#619	#220	225	0	98	222	#611
Internal Link Dist (ft)		1155		834		912			742	
Turn Bay Length (ft)	550		490		250		225	200		
Base Capacity (vph)	425	2194	131	1836	345	509	544	338	492	537
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	1.00	0.59	0.46	0.98	0.72	0.45	0.15	0.32	0.45	1.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	390	1050	145	55	1575	85	230	210	75	100	205	525
Future Volume (vph)	390	1050	145	55	1575	85	230	210	75	100	205	525
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	4944		1752	4997		1752	1845	1568	1752	1845	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.48	1.00	1.00	0.51	1.00	1.00
Satd. Flow (perm)	3400	4944		1752	4997		882	1845	1568	941	1845	1568
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)	424	1141	158	60	1712	92	250	228	82	109	223	571
RTOR Reduction (vph)	0	15	0	0	5	0	0	0	59	0	0	120
Lane Group Flow (vph)	424	1284	0	60	1799	0	250	228	23	109	223	451
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	13.0	49.5		5.5	42.0		40.1	33.1	33.1	37.9	32.0	32.0
Effective Green, g (s)	15.0	51.5		7.5	44.0		40.1	33.1	33.1	37.9	32.0	32.0
Actuated g/C Ratio	0.12	0.43		0.06	0.37		0.33	0.28	0.28	0.32	0.27	0.27
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	1.5	3.0		1.5	3.0		1.5	2.0	2.0	1.5	2.0	2.0
Lane Grp Cap (vph)	425	2121		109	1832		345	508	432	337	492	418
v/s Ratio Prot	c0.12	0.26		0.03	c0.36		c0.04	0.12		0.02	0.12	
v/s Ratio Perm							0.20		0.01	0.09		c0.29
v/c Ratio	1.00	0.61		0.55	0.98		0.72	0.45	0.05	0.32	0.45	1.08
Uniform Delay, d1	52.5	26.4		54.6	37.6		35.1	35.9	31.9	30.1	36.7	44.0
Progression Factor	0.89	0.75		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	40.3	1.2		3.4	17.2		6.3	0.2	0.0	0.2	0.2	67.2
Delay (s)	86.8	21.0		58.0	54.8		41.3	36.1	31.9	30.3	36.9	111.2
Level of Service	F	C		E	D		D	D	C	C	D	F
Approach Delay (s)		37.2			54.9			37.8			83.1	
Approach LOS		D			D			D			F	

Intersection Summary			
HCM 2000 Control Delay	52.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	49	2261	299	2266	65	250	11	402	274	281	359
v/c Ratio	0.56	0.91	1.16	0.86	0.05	0.70	0.06	1.04	0.91	0.91	0.86
Control Delay	88.5	40.2	166.8	20.2	0.1	70.9	55.1	99.4	88.6	89.3	46.6
Queue Delay	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.5	40.2	166.8	20.9	0.1	70.9	55.1	99.4	88.6	89.3	46.6
Queue Length 50th (ft)	44	698	~169	545	0	115	9	~337	255	263	172
Queue Length 95th (ft)	#98	#873	m#258	536	m0	157	29	#506	#415	#425	#330
Internal Link Dist (ft)		580		548			436			396	
Turn Bay Length (ft)	450		375		350	225		250	200		
Base Capacity (vph)	88	2475	257	2623	1213	784	425	387	324	330	419
Starvation Cap Reductn	0	0	0	121	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.91	1.16	0.91	0.05	0.32	0.03	1.04	0.85	0.85	0.86

Intersection Summary

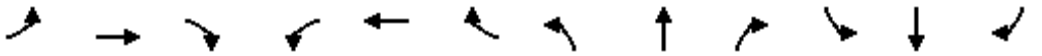
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

1: SW 12th Avenue & Hillsboro Bvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	1935	145	275	2085	60	230	10	370	420	90	330
Future Volume (vph)	45	1935	145	275	2085	60	230	10	370	420	90	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.0	6.0	6.0	6.5	6.0	6.0	6.5
Lane Util. Factor	1.00	0.91		0.97	0.91	1.00	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (prot)	1770	5032		3433	5085	1583	3433	1863	1583	1681	1714	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1770	5032		3433	5085	1583	3433	1863	1583	1681	1714	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)	49	2103	158	299	2266	65	250	11	402	457	98	359
RTOR Reduction (vph)	0	5	0	0	0	19	0	0	62	0	0	83
Lane Group Flow (vph)	49	2256	0	299	2266	46	250	11	340	274	281	276
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	1	6		5	2	3	4	4	5	3	3	1
Permitted Phases						2			4			3
Actuated Green, G (s)	5.0	66.7		8.5	70.2	95.4	14.6	14.6	23.1	25.2	25.2	30.2
Effective Green, g (s)	7.0	68.7		10.5	72.2	99.4	14.6	14.6	23.1	25.2	25.2	30.2
Actuated g/C Ratio	0.05	0.49		0.08	0.52	0.71	0.10	0.10	0.17	0.18	0.18	0.22
Clearance Time (s)	6.5	6.5		6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Vehicle Extension (s)	1.5	3.0		2.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	1.5
Lane Grp Cap (vph)	88	2469		257	2622	1123	358	194	261	302	308	341
v/s Ratio Prot	0.03	c0.45		0.09	c0.45	0.01	0.07	0.01	c0.08	0.16	c0.16	0.03
v/s Ratio Perm						0.02			0.14			0.15
v/c Ratio	0.56	0.91		1.16	0.86	0.04	0.70	0.06	1.30	0.91	0.91	0.81
Uniform Delay, d1	65.0	32.9		64.8	29.6	6.1	60.6	56.5	58.5	56.3	56.3	52.2
Progression Factor	1.00	1.00		1.28	0.55	0.01	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.3	6.6		99.5	2.9	0.0	4.7	0.0	161.6	28.4	29.3	12.5
Delay (s)	69.3	39.5		182.4	19.2	0.1	65.3	56.5	220.1	84.7	85.6	64.7
Level of Service	E	D		F	B	A	E	E	F	F	F	E
Approach Delay (s)		40.2			37.3			159.0			77.1	
Approach LOS		D			D			F			E	

Intersection Summary			
HCM 2000 Control Delay	56.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Queues

Lane Group	EBT	EBR	WBT	SBL2	SBR
Lane Group Flow (vph)	2092	842	1967	684	642
v/c Ratio	0.41	0.53	0.78	0.88	0.53
Control Delay	0.1	0.7	24.4	50.0	30.0
Queue Delay	0.0	0.0	0.7	0.0	0.0
Total Delay	0.1	0.7	25.1	50.0	30.0
Queue Length 50th (ft)	0	0	369	549	233
Queue Length 95th (ft)	m0	m0	641	693	277
Internal Link Dist (ft)	548		319		
Turn Bay Length (ft)		150			
Base Capacity (vph)	5085	1583	2535	853	1343
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	244	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.41	0.53	0.86	0.80	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑	↱		↑↑↑		↰		↱↱		
Traffic Volume (vph)	0	1925	800	0	1810	0	650	0	610	0	0
Future Volume (vph)	0	1925	800	0	1810	0	650	0	610	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		2.0	2.0		4.5		4.5		4.5		
Lane Util. Factor		0.91	1.00		0.91		1.00		0.88		
Frt		1.00	0.85		1.00		1.00		0.85		
Flt Protected		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (prot)		5085	1583		5085		1770		2787		
Flt Permitted		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (perm)		5085	1583		5085		1770		2787		
Peak-hour factor, PHF	0.92	0.92	0.95	0.92	0.92	0.92	0.95	0.92	0.95	0.92	0.92
Adj. Flow (vph)	0	2092	842	0	1967	0	684	0	642	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2092	842	0	1967	0	684	0	642	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA	Perm		NA		Prot		Prot		
Protected Phases		Free!			2		8!		3		
Permitted Phases			Free								
Actuated Green, G (s)		140.0	140.0		67.8		59.2		59.2		
Effective Green, g (s)		140.0	140.0		69.8		61.2		61.2		
Actuated g/C Ratio		1.00	1.00		0.50		0.44		0.44		
Clearance Time (s)					6.5		6.5		6.5		
Vehicle Extension (s)					3.0		2.5		2.5		
Lane Grp Cap (vph)		5085	1583		2535		773		1218		
v/s Ratio Prot		0.41			c0.39		c0.39		0.23		
v/s Ratio Perm			0.53								
v/c Ratio		0.41	0.53		0.78		0.88		0.53		
Uniform Delay, d1		0.0	0.0		28.7		36.2		28.8		
Progression Factor		1.00	1.00		0.76		1.00		1.00		
Incremental Delay, d2		0.1	0.5		1.7		11.7		0.3		
Delay (s)		0.1	0.5		23.5		47.9		29.1		
Level of Service		A	A		C		D		C		
Approach Delay (s)		0.2			23.5			38.8		0.0	
Approach LOS		A			C			D		A	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	2038	2315	804	620	789
v/c Ratio	0.70	0.79	0.51	0.37	0.82
Control Delay	13.3	12.3	0.6	18.4	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	12.3	0.6	18.4	28.2
Queue Length 50th (ft)	240	302	0	69	159
Queue Length 95th (ft)	254	m324	m0	97	#240
Internal Link Dist (ft)	286	371			
Turn Bay Length (ft)			250	350	350
Base Capacity (vph)	2920	2920	1568	1710	991
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.70	0.79	0.51	0.36	0.80

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1875	0	0	2130	740	570	0	750	0	0	0
Future Volume (vph)	0	1875	0	0	2130	740	570	0	750	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5	2.0	2.0		2.0			
Lane Util. Factor		0.91			0.91	1.00	0.94		0.88			
Frt		1.00			1.00	0.85	1.00		0.85			
Flt Protected		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085			5085	1568	4990		2787			
Flt Permitted		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085			5085	1568	4990		2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.92	0.92	0.92
Adj. Flow (vph)	0	2038	0	0	2315	804	620	0	789	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	37	0	0	0
Lane Group Flow (vph)	0	2038	0	0	2315	804	620	0	752	0	0	0
Heavy Vehicles (%)	3%	2%	2%	2%	2%	3%	2%	3%	2%	3%	3%	3%
Turn Type		NA			NA	Free	Prot		Prot			
Protected Phases		6			2		4		4			
Permitted Phases						Free						
Actuated Green, G (s)		38.2			38.2	70.0	21.3		21.3			
Effective Green, g (s)		40.2			40.2	70.0	23.3		23.3			
Actuated g/C Ratio		0.57			0.57	1.00	0.33		0.33			
Clearance Time (s)		6.5			6.5		4.0		4.0			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		2920			2920	1568	1660		927			
v/s Ratio Prot		0.40			c0.46		0.12		c0.27			
v/s Ratio Perm						0.51						
v/c Ratio		0.70			0.79	0.51	0.37		0.81			
Uniform Delay, d1		10.6			11.6	0.0	17.8		21.3			
Progression Factor		1.11			0.93	1.00	1.00		1.00			
Incremental Delay, d2		1.2			1.2	0.6	0.1		5.5			
Delay (s)		13.0			12.1	0.6	17.9		26.8			
Level of Service		B			B	A	B		C			
Approach Delay (s)		13.0			9.1			22.9			0.0	
Approach LOS		B			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	6.5
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	103	2413	337	152	2467	38	315	11	141	136	54	337
v/c Ratio	0.60	0.86	0.36	1.00	0.83	0.04	1.08	0.03	0.38	0.43	0.16	0.88
Control Delay	77.3	24.6	8.6	135.8	27.5	0.1	125.0	43.4	12.7	46.2	46.5	57.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.3	24.6	8.6	135.8	27.5	0.1	125.0	43.4	12.7	46.2	46.5	57.8
Queue Length 50th (ft)	45	598	102	141	632	0	~286	8	12	100	42	197
Queue Length 95th (ft)	m65	#921	m175	#290	#858	0	#351	25	66	144	75	291
Internal Link Dist (ft)		660			631			513			403	
Turn Bay Length (ft)	300		150	100		200	125					340
Base Capacity (vph)	171	2799	928	152	2984	979	291	492	510	313	505	520
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.86	0.36	1.00	0.83	0.04	1.08	0.02	0.28	0.43	0.11	0.65

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

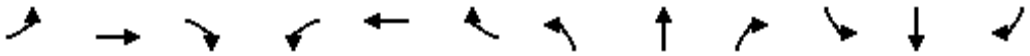
HCM Signalized Intersection Capacity Analysis

4: SW Natura Boulevard/Fairway Drive & Hillsboro Bvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	2220	310	140	2270	35	290	10	130	125	50	310
Future Volume (vph)	95	2220	310	140	2270	35	290	10	130	125	50	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.72	1.00	1.00	0.72	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	1345	1863	1583	1341	1863	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)	103	2413	337	152	2467	38	315	11	141	136	54	337
RTOR Reduction (vph)	0	0	57	0	0	16	0	0	104	0	0	103
Lane Group Flow (vph)	103	2413	280	152	2467	22	315	11	37	136	54	234
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2	4		4	8		8
Actuated Green, G (s)	5.0	75.1	75.1	10.1	80.2	80.2	28.8	23.8	23.8	30.8	24.8	24.8
Effective Green, g (s)	7.0	77.1	77.1	12.1	82.2	82.2	28.8	23.8	23.8	30.8	24.8	24.8
Actuated g/C Ratio	0.05	0.55	0.55	0.09	0.59	0.59	0.21	0.17	0.17	0.22	0.18	0.18
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.0	3.0	3.0	1.5	3.0	3.0	1.5	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	171	2800	871	152	2985	929	291	316	269	313	330	280
v/s Ratio Prot	0.03	c0.47		c0.09	0.49		c0.04	0.01		0.02	0.03	
v/s Ratio Perm			0.18			0.01	c0.18		0.02	0.08		0.15
v/c Ratio	0.60	0.86	0.32	1.00	0.83	0.02	1.08	0.03	0.14	0.43	0.16	0.84
Uniform Delay, d1	65.1	26.9	17.2	64.0	23.2	12.1	54.9	48.5	49.4	46.6	48.8	55.6
Progression Factor	1.02	0.76	0.66	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.8	2.6	0.7	73.0	2.8	0.0	76.5	0.0	0.1	0.4	0.1	18.3
Delay (s)	69.4	23.1	11.9	136.9	26.0	12.1	131.4	48.5	49.5	46.9	48.9	73.9
Level of Service	E	C	B	F	C	B	F	D	D	D	D	E
Approach Delay (s)		23.5			32.1			104.7			64.4	
Approach LOS		C			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	36.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Queues



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	380	1424	207	527	1755	587	277	560	435	478	832	696
v/c Ratio	1.14	1.03	0.24	1.10	1.14	0.59	1.11	0.82	0.67	0.88	0.84	1.22
Control Delay	161.3	85.0	6.5	131.0	117.6	15.8	162.0	80.7	40.6	91.9	70.4	152.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	161.3	85.0	6.5	131.0	117.6	15.8	162.0	80.7	40.6	91.9	70.4	152.2
Queue Length 50th (ft)	~268	~943	24	~369	~1257	209	~191	340	329	287	492	~844
Queue Length 95th (ft)	#383	#1082	75	m#473	#1391	m308	#294	416	465	#372	580	#1103
Internal Link Dist (ft)		620			1001			569			457	
Turn Bay Length (ft)	550		500	550		500	300		300	650		650
Base Capacity (vph)	333	1382	855	480	1533	1007	249	682	651	558	985	571
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.14	1.03	0.24	1.10	1.14	0.58	1.11	0.82	0.67	0.86	0.84	1.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

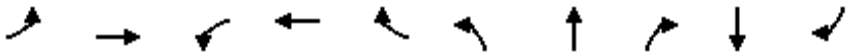
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	350	1310	190	485	1615	540	255	515	400	440	765	640
Future Volume (vph)	350	1310	190	485	1615	540	255	515	400	440	765	640
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.9	5.5	4.0	5.9	5.9	5.9	5.5	5.9	5.9	5.9
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	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)	380	1424	207	527	1755	587	277	560	435	478	832	696
RTOR Reduction (vph)	0	0	90	0	0	31	0	0	76	0	0	131
Lane Group Flow (vph)	380	1424	117	527	1755	556	277	560	359	478	832	565
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	
Permitted Phases			6			2			4			8
Actuated Green, G (s)	15.5	68.3	79.4	23.2	76.0	102.5	11.1	32.7	55.9	26.5	48.1	48.1
Effective Green, g (s)	17.5	70.3	83.4	25.2	78.0	106.5	13.1	34.7	59.9	28.5	50.1	50.1
Actuated g/C Ratio	0.10	0.39	0.46	0.14	0.43	0.59	0.07	0.19	0.33	0.16	0.28	0.28
Clearance Time (s)	7.5	6.0	7.9	7.5	6.0	7.9	7.9	7.9	7.5	7.9	7.9	7.9
Vehicle Extension (s)	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	3.0
Lane Grp Cap (vph)	333	1382	733	480	1533	936	249	682	526	543	985	440
v/s Ratio Prot	0.11	0.40	0.01	c0.15	c0.50	0.09	c0.08	0.16	0.10	0.14	0.24	
v/s Ratio Perm			0.06			0.26			0.13			c0.36
v/c Ratio	1.14	1.03	0.16	1.10	1.14	0.59	1.11	0.82	0.68	0.88	0.84	1.28
Uniform Delay, d1	81.2	54.9	28.0	77.4	51.0	23.1	83.5	69.7	51.8	74.1	61.3	65.0
Progression Factor	1.00	1.00	1.00	1.04	1.06	0.80	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	93.3	32.3	0.0	60.5	69.8	0.4	90.6	7.9	2.9	15.0	6.7	144.6
Delay (s)	174.5	87.2	28.0	140.9	123.8	18.9	174.0	77.5	54.7	89.0	68.0	209.5
Level of Service	F	F	C	F	F	B	F	E	D	F	E	F
Approach Delay (s)		97.6			105.5			90.8			122.1	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	105.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	104.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Queues

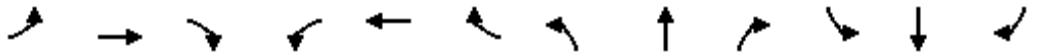


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	103	2233	130	1853	114	243	240	511	168	549
v/c Ratio	0.60	0.83	0.76	0.86	0.16	0.64	0.63	0.90	0.57	0.91
Control Delay	81.2	40.7	107.2	50.2	5.3	71.8	71.2	62.3	73.5	72.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.2	40.7	107.2	50.2	5.3	71.8	71.2	62.3	73.5	72.8
Queue Length 50th (ft)	61	561	0	668	6	274	269	441	179	306
Queue Length 95th (ft)	m68	m563	m#123	728	m25	384	380	#653	266	#425
Internal Link Dist (ft)		900		925			695		185	
Turn Bay Length (ft)	700		750		750			150		
Base Capacity (vph)	171	2697	171	2145	708	392	394	570	316	631
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	0.60	0.83	0.76	0.86	0.16	0.62	0.61	0.90	0.53	0.87

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	1970	85	120	1705	105	430	15	470	150	5	505
Future Volume (vph)	95	1970	85	120	1705	105	430	15	470	150	5	505
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	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	0.97	0.86		0.97	0.91	1.00	0.95	0.95	1.00		1.00	0.88
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	0.96	1.00		0.95	1.00
Satd. Flow (prot)	3367	6368		3433	5085	1524	1681	1691	1583		1542	2030
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	0.96	1.00		0.95	1.00
Satd. Flow (perm)	3367	6368		3433	5085	1524	1681	1691	1583		1542	2030
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)	103	2141	92	130	1853	114	467	16	511	163	5	549
RTOR Reduction (vph)	0	3	0	0	0	66	0	0	101	0	0	67
Lane Group Flow (vph)	103	2230	0	130	1853	48	243	240	410	0	168	482
Heavy Vehicles (%)	4%	2%	2%	2%	2%	6%	2%	2%	2%	18%	2%	40%
Turn Type	Prot	NA		Prot	NA	Prot	Split	NA	pt+ov	Split	NA	pt+ov
Protected Phases	1	6		5	2	2	3	3	3 5	4	4	4 1
Permitted Phases												
Actuated Green, G (s)	7.2	74.1		7.0	73.9	73.9	40.4	40.4	53.4		34.5	47.7
Effective Green, g (s)	9.2	76.1		9.0	75.9	75.9	40.4	40.4	53.4		34.5	47.7
Actuated g/C Ratio	0.05	0.42		0.05	0.42	0.42	0.22	0.22	0.30		0.19	0.27
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	1.5	3.0		2.5	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	172	2692		171	2144	642	377	379	469		295	537
v/s Ratio Prot	0.03	c0.35		0.04	c0.36	0.03	0.14	0.14	c0.26		0.11	c0.24
v/s Ratio Perm												
v/c Ratio	0.60	0.83		0.76	0.86	0.07	0.64	0.63	0.88		0.57	0.90
Uniform Delay, d1	83.6	46.1		84.4	47.4	31.1	63.3	63.1	60.1		66.0	63.8
Progression Factor	0.90	0.84		1.00	0.95	0.98	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.4	1.2		15.2	4.4	0.2	3.8	3.4	16.5		2.5	17.6
Delay (s)	76.5	39.8		99.3	49.4	30.6	67.0	66.5	76.6		68.5	81.4
Level of Service	E	D		F	D	C	E	E	E		E	F
Approach Delay (s)		41.4			51.5			71.8			78.4	
Approach LOS		D			D			E			E	

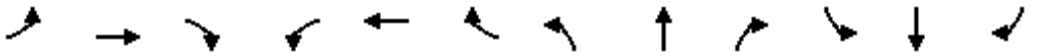
Intersection Summary			
HCM 2000 Control Delay	54.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Queues

Lane Group	EBT	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	2794	811	1641	316	442
v/c Ratio	0.95	0.73	0.42	0.49	0.85
Control Delay	30.9	52.0	3.9	68.6	86.6
Queue Delay	0.0	0.0	0.1	0.0	0.0
Total Delay	30.9	52.0	4.0	68.6	86.6
Queue Length 50th (ft)	498	337	112	174	290
Queue Length 95th (ft)	538	400	113	228	#384
Internal Link Dist (ft)	925		322		
Turn Bay Length (ft)		500		500	500
Base Capacity (vph)	2937	1110	3884	640	520
Starvation Cap Reductn	0	0	810	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.95	0.73	0.53	0.49	0.85

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1980	610	770	1510	0	0	0	0	300	0	420
Future Volume (vph)	0	1980	610	770	1510	0	0	0	0	300	0	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.5					4.4		4.4
Lane Util. Factor		0.81		0.97	0.91					0.97		0.88
Frt		0.97		1.00	1.00					1.00		0.85
Flt Protected		1.00		0.95	1.00					0.95		1.00
Satd. Flow (prot)		7284		3433	5085					3433		2787
Flt Permitted		1.00		0.95	1.00					0.95		1.00
Satd. Flow (perm)		7284		3433	5085					3433		2787
Peak-hour factor, PHF	0.92	0.92	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	0	2152	642	811	1641	0	0	0	0	316	0	442
RTOR Reduction (vph)	0	30	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2764	0	811	1641	0	0	0	0	316	0	442
Turn Type		NA		Prot	NA					Prot		Prot
Protected Phases		6		5 4	2 4					3		3
Permitted Phases												
Actuated Green, G (s)		69.8		53.8	135.5					31.6		31.6
Effective Green, g (s)		71.8		57.8	133.1					33.6		33.6
Actuated g/C Ratio		0.40		0.32	0.74					0.19		0.19
Clearance Time (s)		6.0								6.4		6.4
Vehicle Extension (s)		3.0								2.0		2.0
Lane Grp Cap (vph)		2905		1102	3760					640		520
v/s Ratio Prot		c0.38		c0.24	0.32					0.09		c0.16
v/s Ratio Perm												
v/c Ratio		0.95		0.74	0.44					0.49		0.85
Uniform Delay, d1		52.4		54.3	9.0					65.6		70.8
Progression Factor		0.49		1.28	0.48					1.00		1.00
Incremental Delay, d2		5.3		2.4	0.1					0.2		11.9
Delay (s)		31.2		71.8	4.4					65.8		82.6
Level of Service		C		E	A					E		F
Approach Delay (s)		31.2			26.7			0.0			75.6	
Approach LOS		C			C			A			E	

Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	NBL	NBR
Lane Group Flow (vph)	1663	789	2185	621	716
v/c Ratio	0.56	0.28	0.40	0.55	0.88
Control Delay	3.5	0.1	4.8	63.6	79.7
Queue Delay	0.1	0.0	0.3	0.0	0.0
Total Delay	3.6	0.1	5.1	63.6	79.7
Queue Length 50th (ft)	84	0	32	232	362
Queue Length 95th (ft)	m118	m0	m49	278	#434
Internal Link Dist (ft)	233		630	1225	
Turn Bay Length (ft)		700		410	430
Base Capacity (vph)	2988	2787	5461	1131	818
Starvation Cap Reductn	132	0	2202	0	0
Spillback Cap Reductn	255	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.61	0.28	0.67	0.55	0.88

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

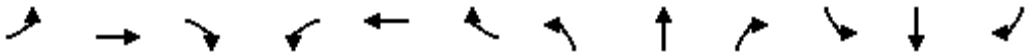
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1530	750	0	2010	590	680
Future Volume (vph)	1530	750	0	2010	590	680
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	2.0		4.5	4.4	4.4
Lane Util. Factor	0.91	0.88		0.81	0.94	0.76
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	5085	2787		7544	4990	3610
Flt Permitted	1.00	1.00		1.00	0.95	1.00
Satd. Flow (perm)	5085	2787		7544	4990	3610
Peak-hour factor, PHF	0.92	0.95	0.92	0.92	0.95	0.95
Adj. Flow (vph)	1663	789	0	2185	621	716
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1663	789	0	2185	621	716
Turn Type	NA	Free		NA	Prot	Prot
Protected Phases	6 3			2 3	4	4
Permitted Phases		Free				
Actuated Green, G (s)	101.4	180.0		128.4	38.8	38.8
Effective Green, g (s)	105.4	180.0		130.4	40.8	40.8
Actuated g/C Ratio	0.59	1.00		0.72	0.23	0.23
Clearance Time (s)					6.4	6.4
Vehicle Extension (s)					3.5	3.5
Lane Grp Cap (vph)	2977	2787		5465	1131	818
v/s Ratio Prot	c0.33			c0.29	0.12	c0.20
v/s Ratio Perm		0.28				
v/c Ratio	0.56	0.28		0.40	0.55	0.88
Uniform Delay, d1	23.0	0.0		9.6	61.5	67.1
Progression Factor	0.25	1.00		0.48	1.00	1.00
Incremental Delay, d2	0.1	0.1		0.0	0.6	10.6
Delay (s)	5.8	0.1		4.6	62.1	77.7
Level of Service	A	A		A	E	E
Approach Delay (s)	4.0			4.6	70.4	
Approach LOS	A			A	E	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

5: Research Park Boulevard/SW Natura Boulevard & SR 869/SW 10th Street

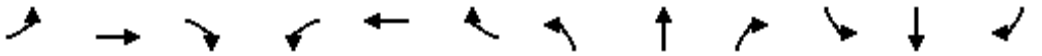


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	321	1772	310	375	1413	147	332	201	245	299	337	440
v/c Ratio	0.77	0.87	0.41	0.89	0.69	0.21	0.98	0.24	0.44	0.66	0.93	0.89
Control Delay	93.2	52.3	14.2	100.0	47.4	10.0	97.7	56.6	8.2	48.2	102.5	53.3
Queue Delay	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.2	53.7	14.2	100.0	47.4	10.0	97.7	56.6	8.2	48.2	102.5	53.3
Queue Length 50th (ft)	183	608	68	228	520	21	339	102	0	252	391	261
Queue Length 95th (ft)	m232	710	m142	#314	586	74	#552	142	78	342	#567	#455
Internal Link Dist (ft)		630			1233			1112			1327	
Turn Bay Length (ft)	300		300	200		300	260		260	170		170
Base Capacity (vph)	467	2041	756	431	2049	708	340	843	563	470	386	511
Starvation Cap Reductn	0	121	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.92	0.41	0.87	0.69	0.21	0.98	0.24	0.44	0.64	0.87	0.86

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	295	1630	285	345	1300	135	305	185	225	275	310	405
Future Volume (vph)	295	1630	285	345	1300	135	305	185	225	275	310	405
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.4	4.4	4.4	4.4	4.4	5.7	5.7	5.7	5.7	5.7	5.7
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	1770	3539	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.10	1.00	1.00	0.63	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	189	3539	1583	1165	1863	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)	321	1772	310	375	1413	147	332	201	245	299	337	440
RTOR Reduction (vph)	0	0	121	0	0	70	0	0	187	0	0	186
Lane Group Flow (vph)	321	1772	189	375	1413	77	332	201	58	299	337	254
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2	4		4	8		8
Actuated Green, G (s)	19.9	70.2	70.2	20.2	70.5	70.5	71.1	42.3	42.3	58.2	35.1	35.1
Effective Green, g (s)	21.9	72.2	72.2	22.2	72.5	72.5	71.1	42.3	42.3	58.2	35.1	35.1
Actuated g/C Ratio	0.12	0.40	0.40	0.12	0.40	0.40	0.39	0.23	0.23	0.32	0.20	0.20
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	5.7	5.7	5.7	5.7	5.7	5.7
Vehicle Extension (s)	1.5	3.0	3.0	1.5	3.0	3.0	1.5	2.0	2.0	1.5	2.0	2.0
Lane Grp Cap (vph)	417	2039	634	423	2048	637	340	831	372	454	363	308
v/s Ratio Prot	0.09	c0.35		c0.11	0.28		c0.16	0.06		0.08	0.18	
v/s Ratio Perm			0.12			0.05	c0.22		0.04	0.13		0.16
v/c Ratio	0.77	0.87	0.30	0.89	0.69	0.12	0.98	0.24	0.15	0.66	0.93	0.82
Uniform Delay, d1	76.6	49.6	36.7	77.7	44.5	33.7	58.0	55.8	54.7	49.6	71.2	69.5
Progression Factor	1.09	0.96	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.8	3.3	0.2	19.0	1.9	0.4	41.9	0.1	0.1	2.6	29.0	15.5
Delay (s)	89.2	50.9	36.2	96.7	46.4	34.1	99.9	55.9	54.7	52.2	100.2	85.0
Level of Service	F	D	D	F	D	C	F	E	D	D	F	F
Approach Delay (s)		54.1			55.2			74.3			80.7	
Approach LOS		D			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	61.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Queues

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	2755	272	2516	125	130
v/c Ratio	0.64	0.95	0.64	0.67	0.46
Control Delay	20.1	95.8	2.5	72.8	13.6
Queue Delay	0.0	43.4	0.2	0.0	0.0
Total Delay	20.1	139.2	2.8	72.8	13.6
Queue Length 50th (ft)	369	196	61	103	0
Queue Length 95th (ft)	443	#396	42	164	58
Internal Link Dist (ft)	575		175	531	
Turn Bay Length (ft)					
Base Capacity (vph)	4288	285	3961	503	543
Starvation Cap Reductn	0	56	613	0	0
Spillback Cap Reductn	153	0	0	0	2
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.67	1.19	0.75	0.25	0.24

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2440	95	250	2315	115	120
Future Volume (vph)	2440	95	250	2315	115	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	9.0	9.0
Lane Util. Factor	0.81		1.00	0.91	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	7502		1770	5085	1770	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	7502		1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2652	103	272	2516	125	130
RTOR Reduction (vph)	3	0	0	0	0	116
Lane Group Flow (vph)	2752	0	272	2516	125	14
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2 3		1	1 2 3	4	
Permitted Phases					4	4
Actuated Green, G (s)	72.3		19.0	99.3	13.7	13.7
Effective Green, g (s)	74.3		21.0	101.3	13.7	13.7
Actuated g/C Ratio	0.57		0.16	0.78	0.11	0.11
Clearance Time (s)			8.0		9.0	9.0
Vehicle Extension (s)			1.5		2.0	2.0
Lane Grp Cap (vph)	4287		285	3962	186	166
v/s Ratio Prot	c0.37		c0.15	c0.49	c0.07	
v/s Ratio Perm						0.01
v/c Ratio	0.64		0.95	0.64	0.67	0.08
Uniform Delay, d1	18.8		54.0	6.3	56.0	52.5
Progression Factor	1.00		1.11	0.29	1.00	1.00
Incremental Delay, d2	0.2		34.6	0.2	7.3	0.1
Delay (s)	19.1		94.3	2.0	63.3	52.6
Level of Service	B		F	A	E	D
Approach Delay (s)	19.1			11.0	57.8	
Approach LOS	B			B	E	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	196	2587	2620	315	207	168
v/c Ratio	1.03	0.52	0.65	0.28	0.57	0.53
Control Delay	107.2	2.2	13.1	1.0	61.0	13.6
Queue Delay	0.0	0.1	0.1	0.0	0.0	0.1
Total Delay	107.2	2.2	13.1	1.0	61.0	13.8
Queue Length 50th (ft)	~176	25	355	1	87	0
Queue Length 95th (ft)	#334	38	450	m12	122	65
Internal Link Dist (ft)		175	1004		271	
Turn Bay Length (ft)				450		
Base Capacity (vph)	190	4992	4006	1107	977	570
Starvation Cap Reductn	0	737	0	0	0	0
Spillback Cap Reductn	0	0	185	0	0	60
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.61	0.69	0.28	0.21	0.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	180	2380	2410	290	190	155
Future Volume (vph)	180	2380	2410	290	190	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	9.0	9.0
Lane Util. Factor	1.00	0.86	0.86	1.00	0.97	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	0.95	1.00
Satd. Flow (prot)	1770	6408	6408	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	6408	6408	1583	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	2587	2620	315	207	168
RTOR Reduction (vph)	0	0	0	118	0	150
Lane Group Flow (vph)	196	2587	2620	197	207	18
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	3	1 2 3	1 2		4	
Permitted Phases				1 2		4
Actuated Green, G (s)	12.0	99.3	79.3	79.3	13.7	13.7
Effective Green, g (s)	14.0	101.3	81.3	81.3	13.7	13.7
Actuated g/C Ratio	0.11	0.78	0.63	0.63	0.11	0.11
Clearance Time (s)	8.0				9.0	9.0
Vehicle Extension (s)	1.5				2.0	2.0
Lane Grp Cap (vph)	190	4993	4007	989	361	166
v/s Ratio Prot	c0.11	0.40	c0.41		c0.06	
v/s Ratio Perm				0.12		0.01
v/c Ratio	1.03	0.52	0.65	0.20	0.57	0.11
Uniform Delay, d1	58.0	5.3	15.4	10.4	55.4	52.6
Progression Factor	0.68	0.33	0.79	0.55	1.00	1.00
Incremental Delay, d2	66.1	0.0	0.2	0.0	1.4	0.1
Delay (s)	105.7	1.8	12.3	5.7	56.7	52.7
Level of Service	F	A	B	A	E	D
Approach Delay (s)		9.1	11.6		54.9	
Approach LOS		A	B		D	

Intersection Summary			
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

Lane Group	EBT	EBR	WBT	SBL2	SBR
Lane Group Flow (vph)	2022	747	2125	563	784
v/c Ratio	0.61	0.47	0.81	0.52	0.90
Control Delay	10.7	2.6	13.8	20.4	36.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	2.6	13.8	20.4	36.9
Queue Length 50th (ft)	196	30	231	92	165
Queue Length 95th (ft)	295	78	276	136	#276
Internal Link Dist (ft)	1004		259		
Turn Bay Length (ft)		250			
Base Capacity (vph)	3312	1583	2628	1082	878
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.61	0.47	0.81	0.52	0.89

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑↑	↱		↑↑↑		↰↰		↱↱		
Traffic Volume (vph)	0	1860	710	0	1955	0	535	0	745	0	0
Future Volume (vph)	0	1860	710	0	1955	0	535	0	745	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	2.0		5.5		5.5		5.5		
Lane Util. Factor		0.86	1.00		0.91		0.97		0.88		
Frt		1.00	0.85		1.00		1.00		0.85		
Flt Protected		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (prot)		6408	1583		5085		3433		2787		
Flt Permitted		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (perm)		6408	1583		5085		3433		2787		
Peak-hour factor, PHF	0.92	0.92	0.95	0.92	0.92	0.92	0.95	0.92	0.95	0.92	0.92
Adj. Flow (vph)	0	2022	747	0	2125	0	563	0	784	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2022	747	0	2125	0	563	0	784	0	0
Turn Type		NA	Free		NA		Prot		Prot		
Protected Phases		6			2		3		3		
Permitted Phases			Free								
Actuated Green, G (s)		31.6	65.0		31.6		18.4		18.4		
Effective Green, g (s)		33.6	65.0		33.6		20.4		20.4		
Actuated g/C Ratio		0.52	1.00		0.52		0.31		0.31		
Clearance Time (s)		7.5			7.5		7.5		7.5		
Vehicle Extension (s)		3.0			3.0		2.5		2.5		
Lane Grp Cap (vph)		3312	1583		2628		1077		874		
v/s Ratio Prot		0.32			c0.42		0.16		c0.28		
v/s Ratio Perm			0.47								
v/c Ratio		0.61	0.47		0.81		0.52		0.90		
Uniform Delay, d1		11.1	0.0		13.0		18.3		21.3		
Progression Factor		0.90	1.00		0.91		1.00		1.00		
Incremental Delay, d2		0.7	0.9		1.9		0.4		11.8		
Delay (s)		10.7	0.9		13.7		18.7		33.1		
Level of Service		B	A		B		B		C		
Approach Delay (s)		8.0			13.7			27.0		0.0	
Approach LOS		A			B			C		A	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL2	NBR
Lane Group Flow (vph)	1832	1842	453	1200	705
v/c Ratio	0.73	0.73	0.29	0.83	0.60
Control Delay	18.9	16.5	0.2	39.3	31.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	16.5	0.2	39.3	31.3
Queue Length 50th (ft)	384	179	0	451	254
Queue Length 95th (ft)	396	m232	m0	513	307
Internal Link Dist (ft)	270	1155			
Turn Bay Length (ft)			250		
Base Capacity (vph)	2522	2522	1583	1571	1275
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.73	0.73	0.29	0.76	0.55

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Traffic Volume (vph)	0	1685	0	0	1695	430	1140	0	670	0	0
Future Volume (vph)	0	1685	0	0	1695	430	1140	0	670	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5	2.0	5.5		5.5		
Lane Util. Factor		0.91			0.91	1.00	0.97		0.88		
Frt		1.00			1.00	0.85	1.00		0.85		
Flt Protected		1.00			1.00	1.00	0.95		1.00		
Satd. Flow (prot)		5085			5085	1583	3433		2787		
Flt Permitted		1.00			1.00	1.00	0.95		1.00		
Satd. Flow (perm)		5085			5085	1583	3433		2787		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.92	0.95	0.92	0.92
Adj. Flow (vph)	0	1832	0	0	1842	453	1200	0	705	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1832	0	0	1842	453	1200	0	705	0	0
Turn Type		NA			NA	Free	Prot		Prot		
Protected Phases		6			2		4		4		
Permitted Phases						Free					
Actuated Green, G (s)		62.5			62.5	130.0	52.5		52.5		
Effective Green, g (s)		64.5			64.5	130.0	54.5		54.5		
Actuated g/C Ratio		0.50			0.50	1.00	0.42		0.42		
Clearance Time (s)		7.5			7.5		7.5		7.5		
Vehicle Extension (s)		3.0			3.0		2.5		2.5		
Lane Grp Cap (vph)		2522			2522	1583	1439		1168		
v/s Ratio Prot		0.36			c0.36		c0.35		0.25		
v/s Ratio Perm						0.29					
v/c Ratio		0.73			0.73	0.29	0.83		0.60		
Uniform Delay, d1		25.8			25.9	0.0	33.7		29.4		
Progression Factor		0.65			0.58	1.00	1.00		1.00		
Incremental Delay, d2		0.9			0.9	0.2	4.2		0.7		
Delay (s)		17.6			15.9	0.2	38.0		30.1		
Level of Service		B			B	A	D		C		
Approach Delay (s)		17.6			12.8			35.0		0.0	
Approach LOS		B			B			D		A	

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

5: NE 3rd Ave & Sample Road

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	511	2049	114	1771	261	337	120	87	266	418
v/c Ratio	0.97	0.82	0.93	0.85	1.09	0.82	0.24	0.51	0.76	0.90
Control Delay	85.2	27.7	125.3	40.3	120.8	64.4	1.1	42.8	63.3	47.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.2	27.7	125.3	40.3	120.8	64.4	1.1	42.8	63.3	47.1
Queue Length 50th (ft)	234	350	97	489	~197	272	0	53	214	184
Queue Length 95th (ft)	#343	479	#217	#658	#280	358	0	87	291	303
Internal Link Dist (ft)		1155		834		912			742	
Turn Bay Length (ft)	550		490		250		225	200		
Base Capacity (vph)	528	2492	122	2075	240	515	583	171	458	547
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	0.97	0.82	0.93	0.85	1.09	0.65	0.21	0.51	0.58	0.76

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	470	1670	215	105	1500	130	240	310	110	80	245	385
Future Volume (vph)	470	1670	215	105	1500	130	240	310	110	80	245	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	4998		1770	5025		1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.25	1.00	1.00	0.26	1.00	1.00
Satd. Flow (perm)	3433	4998		1770	5025		473	1863	1583	477	1863	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)	511	1815	234	114	1630	141	261	337	120	87	266	418
RTOR Reduction (vph)	0	11	0	0	7	0	0	0	94	0	0	170
Lane Group Flow (vph)	511	2038	0	114	1764	0	261	337	26	87	266	248
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	18.0	62.5		7.0	51.5		38.6	28.6	28.6	30.4	24.5	24.5
Effective Green, g (s)	20.0	64.5		9.0	53.5		38.6	28.6	28.6	30.4	24.5	24.5
Actuated g/C Ratio	0.15	0.50		0.07	0.41		0.30	0.22	0.22	0.23	0.19	0.19
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	1.5	3.0		1.5	3.0		1.5	2.0	2.0	1.5	2.0	2.0
Lane Grp Cap (vph)	528	2479		122	2067		240	409	348	170	351	298
v/s Ratio Prot	c0.15	c0.41		0.06	0.35		c0.08	c0.18		0.02	0.14	
v/s Ratio Perm							c0.24		0.02	0.10		0.16
v/c Ratio	0.97	0.82		0.93	0.85		1.09	0.82	0.08	0.51	0.76	0.83
Uniform Delay, d1	54.7	27.9		60.2	34.7		43.3	48.3	40.2	40.9	49.9	50.8
Progression Factor	1.08	0.87		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	25.3	2.4		60.3	4.7		83.4	12.1	0.0	1.1	8.1	17.1
Delay (s)	84.5	26.7		120.6	39.4		126.7	60.4	40.3	41.9	58.0	67.9
Level of Service	F	C		F	D		F	E	D	D	E	E
Approach Delay (s)		38.2			44.3			81.1			61.5	
Approach LOS		D			D			F			E	

Intersection Summary			
HCM 2000 Control Delay	48.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group