














APPENDIX D

2016 Existing Synchro Intersection Analysis

Queues

1: SW 12th Avenue & Hillsboro Boulevard





























											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	263	2016	300	1279	468	89	142	163	21	22	21
v/c Ratio	1.02	0.67	0.70	0.44	0.42	0.25	0.74	0.34	0.27	0.28	0.06
Control Delay	125.4	24.5	84.9	14.9	4.5	66.4	91.2	16.9	81.5	81.6	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	125.4	24.5	84.9	15.1	4.7	66.4	91.2	16.9	81.5	81.6	0.3
Queue Length 50th (ft)	~284	496	151	239	80	44	147	41	23	24	0
Queue Length 95th (ft)	#479	665	m198	305	m159	72	218	101	55	57	0
Internal Link Dist (ft)		580		548			436			396	
Turn Bay Length (ft)	450		375		350	225		250	200		
Base Capacity (vph)	259	2990	504	2909	1173	514	279	516	147	151	334
Starvation Cap Reductn	0	0	0	681	210	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	1.02	0.67	0.60	0.57	0.49	0.17	0.51	0.32	0.14	0.15	0.06

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

HCM Signalized Intersection Capacity Analysis

1: SW 12th Avenue & Hillsboro Boulevard

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 		 	 		 			 			
Traffic Volume (vph)	250	1760	155	285	1215	445	85	135	155	30	10	20	
Future Volume (vph)	250	1760	155	285	1215	445	85	135	155	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	
Fr _t	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Fl _t 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	5024		3433	5085	1583	3433	1863	1583	1681	1726	1583	
Fl _t 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	5024		3433	5085	1583	3433	1863	1583	1681	1726	1583	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	263	1853	163	300	1279	468	89	142	163	32	11	21	
RTOR Reduction (vph)	0	5	0	0	0	80	0	0	88	0	0	17	
Lane Group Flow (vph)	263	2011	0	300	1279	388	89	142	75	21	22	4	
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)	21.5	93.1		18.0	89.6	97.0	16.5	16.5	34.5	7.4	7.4	28.9	
Effective Green, g (s)	23.5	95.1		20.0	91.6	101.0	16.5	16.5	34.5	7.4	7.4	28.9	
Actuated g/C Ratio	0.15	0.59		0.12	0.57	0.63	0.10	0.10	0.22	0.05	0.05	0.18	
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)	259	2986		429	2911	999	354	192	341	77	79	285	
v/s Ratio Prot	c0.15	c0.40		0.09	0.25	c0.02	0.03	c0.08	0.02	0.01	0.01	0.00	
v/s Ratio Perm						0.22			0.02			0.00	
v/c Ratio	1.02	0.67		0.70	0.44	0.39	0.25	0.74	0.22	0.27	0.28	0.01	
Uniform Delay, d ₁	68.2	21.9		67.1	19.5	14.4	66.1	69.7	51.7	73.7	73.7	53.8	
Progression Factor	1.00	1.00		1.15	0.71	0.52	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d ₂	59.9	1.2		3.4	0.4	0.1	0.1	12.1	0.1	0.7	0.7	0.0	
Delay (s)	128.2	23.2		80.8	14.4	7.6	66.2	81.7	51.8	74.4	74.4	53.8	
Level of Service	F	C		F	B	A	E	F	D	E	E	D	
Approach Delay (s)		35.3			22.5			65.8			67.7		
Approach LOS		D			C			E			E		
Intersection Summary													
HCM 2000 Control Delay			32.8									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.75										
Actuated Cycle Length (s)			160.0									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													

2016AM Existing_Hillsboro Blvd.syn

Queues












	→	↘	←	↙	↵
Lane Group	EBT	EBR	WBT	SBL2	SBR
Lane Group Flow (vph)	1311	737	1342	505	705
v/c Ratio	0.26	0.47	0.41	0.95	0.84
Control Delay	0.1	2.7	14.5	81.8	62.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.1	2.7	14.5	81.8	62.2
Queue Length 50th (ft)	0	35	289	513	389
Queue Length 95th (ft)	0	71	m262	#733	480
Internal Link Dist (ft)	548		319		
Turn Bay Length (ft)		150			
Base Capacity (vph)	5085	1583	3264	547	862
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	0.26	0.47	0.41	0.92	0.82

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












2: Hillsboro Boulevard & I-95 SB RAMP

											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑	↑		↑↑↑		↑		↑↑		
Traffic Volume (vph)	0	1245	700	0	1275	0	480	0	670	0	0
Future Volume (vph)	0	1245	700	0	1275	0	480	0	670	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		
Flt		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	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1311	737	0	1342	0	505	0	705	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1311	737	0	1342	0	505	0	705	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)		160.0	160.0		100.7		46.3		46.3		
Effective Green, g (s)		160.0	160.0		102.7		48.3		48.3		
Actuated g/C Ratio		1.00	1.00		0.64		0.30		0.30		
Clearance Time (s)					6.5		6.5		6.5		
Vehicle Extension (s)					3.0		2.5		2.5		
Lane Grp Cap (vph)		5085	1583		3263		534		841		
v/s Ratio Prot		0.26			0.26		c0.29		0.25		
v/s Ratio Perm			c0.47								
v/c Ratio		0.26	0.47		0.41		0.95		0.84		
Uniform Delay, d1		0.0	0.0		13.9		54.6		52.2		
Progression Factor		1.00	1.00		1.00		1.00		1.00		
Incremental Delay, d2		0.1	0.8		0.3		25.8		7.2		
Delay (s)		0.1	0.8		14.3		80.4		59.4		
Level of Service		A	A		B		F		E		
Approach Delay (s)		0.3			14.3			68.2		0.0	
Approach LOS		A			B			E		A	
Intersection Summary											
HCM 2000 Control Delay			22.2				HCM 2000 Level of Service		C		
HCM 2000 Volume to Capacity ratio			0.63								
Actuated Cycle Length (s)			160.0				Sum of lost time (s)		9.0		
Intersection Capacity Utilization			55.6%				ICU Level of Service		B		
Analysis Period (min)			15								
! Phase conflict between lane groups.											
c Critical Lane Group											

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Queues

3: SW Natura Boulevard/Fairway Drive & Hillsboro Boulevard




























											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	284	1600	100	74	1763	416	89	132	32	5	63
v/c Ratio	1.10	0.47	0.09	0.53	0.58	2.04	0.53	0.50	0.25	0.06	0.35
Control Delay	138.2	19.2	2.8	84.0	21.1	513.1	81.2	16.8	60.0	72.0	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	138.2	19.2	2.8	84.0	21.1	513.1	81.2	16.8	60.0	72.0	5.8
Queue Length 50th (ft)	~338	372	10	76	401	~614	91	0	29	5	0
Queue Length 95th (ft)	m#505	455	m21	130	494	#784	152	68	60	20	4
Internal Link Dist (ft)		496			631		513			404	
Turn Bay Length (ft)	150		150	100		125					340
Base Capacity (vph)	259	3404	1094	204	3038	204	465	494	207	465	477
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	1.10	0.47	0.09	0.36	0.58	2.04	0.19	0.27	0.15	0.01	0.13

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












3: SW Natura Boulevard/Fairway Drive & Hillsboro Boulevard

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  							
Traffic Volume (vph)	270	1520	95	70	1600	75	395	85	125	30	5	60
Future Volume (vph)	270	1520	95	70	1600	75	395	85	125	30	5	60
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		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5051		1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.39	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5051		731	1863	1583	1303	1863	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	284	1600	100	74	1684	79	416	89	132	32	5	63
RTOR Reduction (vph)	0	0	34	0	2	0	0	0	120	0	0	60
Lane Group Flow (vph)	284	1600	66	74	1761	0	416	89	12	32	5	3
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6				4		4	8		8
Actuated Green, G (s)	21.5	103.9	103.9	10.6	93.0		26.5	14.5	14.5	12.5	6.5	6.5
Effective Green, g (s)	23.5	105.9	105.9	12.6	95.0		26.5	14.5	14.5	12.5	6.5	6.5
Actuated g/C Ratio	0.15	0.66	0.66	0.08	0.59		0.17	0.09	0.09	0.08	0.04	0.04
Clearance Time (s)	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		1.5	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	259	3365	1047	139	2999		211	168	143	119	75	64
v/s Ratio Prot	c0.16	0.31		0.04	c0.35		c0.17	0.05		0.01	0.00	
v/s Ratio Perm			0.04				c0.15		0.01	0.01		0.00
v/c Ratio	1.10	0.48	0.06	0.53	0.59		1.97	0.53	0.08	0.27	0.07	0.04
Uniform Delay, d1	68.2	13.3	9.5	70.9	20.3		64.8	69.5	66.7	69.2	73.8	73.8
Progression Factor	0.89	1.35	1.38	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	83.5	0.5	0.1	2.0	0.8		453.9	1.4	0.1	0.4	0.1	0.1
Delay (s)	144.2	18.5	13.3	72.8	21.1		518.7	70.9	66.8	69.7	74.0	73.8
Level of Service	F	B	B	E	C		F	E	E	E	E	E
Approach Delay (s)		36.3			23.2			362.5			72.5	
Approach LOS		D			C			F			E	
Intersection Summary												
HCM 2000 Control Delay			77.4			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			160.0			Sum of lost time (s)			21.0			
Intersection Capacity Utilization			88.6%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

2016AM Existing_Hillsboro Blvd.syn

Queues

1: SW 12th Avenue & Hillsboro Boulevard






























											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	43	1952	223	2021	53	213	11	303	246	254	319
v/c Ratio	0.34	0.77	0.62	0.74	0.04	0.70	0.07	0.77	0.85	0.86	0.77
Control Delay	76.6	36.4	93.6	21.3	0.3	82.7	65.7	58.3	89.2	90.2	42.1
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.6	36.4	93.6	21.5	0.3	82.7	65.7	58.3	89.2	90.2	42.1
Queue Length 50th (ft)	44	602	125	258	0	113	11	239	265	274	196
Queue Length 95th (ft)	86	772	173	838	m3	156	32	339	361	371	244
Internal Link Dist (ft)		580		548			436			396	
Turn Bay Length (ft)	450		375		350	225		250	200		
Base Capacity (vph)	215	2536	418	2717	1260	429	232	423	357	364	487
Starvation Cap Reductn	0	0	0	139	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	0.20	0.77	0.53	0.78	0.04	0.50	0.05	0.72	0.69	0.70	0.66

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

1: SW 12th Avenue & Hillsboro Boulevard

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 		 	 		 			 		 
Traffic Volume (vph)	40	1715	120	210	1900	50	200	10	285	380	90	300
Future Volume (vph)	40	1715	120	210	1900	50	200	10	285	380	90	300
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
Flt	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	5035		3433	5085	1583	3433	1863	1583	1681	1716	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	5035		3433	5085	1583	3433	1863	1583	1681	1716	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	43	1824	128	223	2021	53	213	11	303	404	96	319
RTOR Reduction (vph)	0	4	0	0	0	15	0	0	53	0	0	50
Lane Group Flow (vph)	43	1948	0	223	2021	38	213	11	250	246	254	269
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)	9.6	78.4		14.7	83.5	111.1	14.3	14.3	29.0	27.6	27.6	37.2
Effective Green, g (s)	11.6	80.4		16.7	85.5	115.1	14.3	14.3	29.0	27.6	27.6	37.2
Actuated g/C Ratio	0.07	0.50		0.10	0.53	0.72	0.09	0.09	0.18	0.17	0.17	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)	128	2530		358	2717	1138	306	166	286	289	296	368
v/s Ratio Prot	0.02	c0.39		0.06	c0.40	0.01	0.06	0.01	c0.08	0.15	c0.15	0.04
v/s Ratio Perm						0.02			0.08			0.13
v/c Ratio	0.34	0.77		0.62	0.74	0.03	0.70	0.07	0.87	0.85	0.86	0.73
Uniform Delay, d1	70.5	32.3		68.6	28.8	6.5	70.7	66.7	63.7	64.2	64.3	56.8
Progression Factor	1.00	1.00		1.27	0.64	0.26	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	2.3		2.0	1.6	0.0	5.5	0.1	23.5	20.0	20.4	6.3
Delay (s)	71.1	34.6		89.3	19.9	1.7	76.2	66.8	87.2	84.2	84.7	63.1
Level of Service	E	C		F	B	A	E	E	F	F	F	E
Approach Delay (s)		35.4			26.2			82.4			76.1	
Approach LOS		D			C			F			E	
Intersection Summary												
HCM 2000 Control Delay			42.0				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			160.0				Sum of lost time (s)			23.0		
Intersection Capacity Utilization			80.5%				ICU Level of Service				D	
Analysis Period (min)			15									
c Critical Lane Group												

2016PM Existing_Hillsboro Blvd.syn

Queues

2: Hillsboro Boulevard & I-95 SB RAMP

	→	↘	←	↙	↗
Lane Group	EBT	EBR	WBT	SBL2	SBR
Lane Group Flow (vph)	1819	713	1777	543	521
v/c Ratio	0.36	0.45	0.57	0.92	0.56
Control Delay	0.1	0.6	19.4	72.8	45.9
Queue Delay	0.0	0.0	0.1	0.0	0.0
Total Delay	0.1	0.6	19.4	72.8	45.9
Queue Length 50th (ft)	0	0	494	531	246
Queue Length 95th (ft)	0	0	500	#738	312
Internal Link Dist (ft)	548		319		
Turn Bay Length (ft)		150			
Base Capacity (vph)	5085	1583	3103	625	984
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	236	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.36	0.45	0.62	0.87	0.53












Intersection Summary

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

2016PM Existing_Hillsboro Blvd.syn

HCM Signalized Intersection Capacity Analysis












2: Hillsboro Boulevard & I-95 SB RAMP

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR	
Lane Configurations		↑↑↑	↑		↑↑↑		↑		↑↑			
Traffic Volume (vph)	0	1710	670	0	1670	0	510	0	490	0	0	
Future Volume (vph)	0	1710	670	0	1670	0	510	0	490	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			
Fr _t		1.00	0.85		1.00		1.00		0.85			
Fl _t Protected		1.00	1.00		1.00		0.95		1.00			
Satd. Flow (prot)		5085	1583		5085		1770		2787			
Fl _t Permitted		1.00	1.00		1.00		0.95		1.00			
Satd. Flow (perm)		5085	1583		5085		1770		2787			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Adj. Flow (vph)	0	1819	713	0	1777	0	543	0	521	0	0	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	1819	713	0	1777	0	543	0	521	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)		160.0	160.0		95.6		51.4		51.4			
Effective Green, g (s)		160.0	160.0		97.6		53.4		53.4			
Actuated g/C Ratio		1.00	1.00		0.61		0.33		0.33			
Clearance Time (s)					6.5		6.5		6.5			
Vehicle Extension (s)					3.0		2.5		2.5			
Lane Grp Cap (vph)		5085	1583		3101		590		930			
v/s Ratio Prot		0.36			c0.35		c0.31		0.19			
v/s Ratio Perm			0.45									
v/c Ratio		0.36	0.45		0.57		0.92		0.56			
Uniform Delay, d ₁		0.0	0.0		18.7		51.3		43.7			
Progression Factor		1.00	1.00		0.97		1.00		1.00			
Incremental Delay, d ₂		0.1	0.6		0.7		19.8		0.6			
Delay (s)		0.1	0.6		18.8		71.1		44.3			
Level of Service		A	A		B		E		D			
Approach Delay (s)		0.3			18.8			58.0		0.0		
Approach LOS		A			B			E		A		
Intersection Summary												
HCM 2000 Control Delay			17.8								HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			160.0								Sum of lost time (s)	9.0
Intersection Capacity Utilization			56.9%								ICU Level of Service	B
Analysis Period (min)			15									
! Phase conflict between lane groups.												
c Critical Lane Group												

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Queues

3: SW Natura Boulevard/Fairway Drive & Hillsboro Boulevard

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	79	2063	253	121	2110	263	11	116	111	53	284
v/c Ratio	0.54	0.70	0.26	0.71	0.70	0.86	0.05	0.41	0.47	0.41	0.86
Control Delay	85.5	23.9	8.7	92.4	25.5	81.6	62.4	14.3	56.4	78.8	39.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.5	23.9	8.7	92.4	25.5	81.6	62.4	14.3	56.4	78.8	39.3
Queue Length 50th (ft)	78	528	62	124	527	255	11	0	98	55	50
Queue Length 95th (ft)	m126	667	m115	197	730	#333	31	61	145	97	155
Internal Link Dist (ft)		496			631		513			396	
Turn Bay Length (ft)	150		150	100		125					340
Base Capacity (vph)	193	2951	963	193	3014	308	465	482	317	465	572
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	0.41	0.70	0.26	0.63	0.70	0.85	0.02	0.24	0.35	0.11	0.50

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.

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HCM Signalized Intersection Capacity Analysis













3: SW Natura Boulevard/Fairway Drive & Hillsboro Boulevard

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  						 	
Traffic Volume (vph)	75	1960	240	115	1985	20	250	10	110	105	50	270
Future Volume (vph)	75	1960	240	115	1985	20	250	10	110	105	50	270
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		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5078		1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.47	1.00	1.00	0.75	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5078		876	1863	1583	1398	1863	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	79	2063	253	121	2089	21	263	11	116	111	53	284
RTOR Reduction (vph)	0	0	45	0	0	0	0	0	103	0	0	219
Lane Group Flow (vph)	79	2063	208	121	2110	0	263	11	13	111	53	65
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6				4		4	8		8
Actuated Green, G (s)	11.3	90.8	90.8	13.4	92.9		36.8	18.0	18.0	24.0	11.2	11.2
Effective Green, g (s)	13.3	92.8	92.8	15.4	94.9		36.8	18.0	18.0	24.0	11.2	11.2
Actuated g/C Ratio	0.08	0.58	0.58	0.10	0.59		0.23	0.11	0.11	0.15	0.07	0.07
Clearance Time (s)	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		1.5	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	147	2949	918	170	3011		310	209	178	239	130	110
v/s Ratio Prot	0.04	0.41		c0.07	c0.42		c0.10	0.01		0.04	0.03	
v/s Ratio Perm			0.13				c0.09		0.01	0.03		0.04
v/c Ratio	0.54	0.70	0.23	0.71	0.70		0.85	0.05	0.07	0.46	0.41	0.59
Uniform Delay, d1	70.4	23.7	16.3	70.1	22.7		56.4	63.4	63.5	61.7	71.2	72.2
Progression Factor	1.04	0.90	0.76	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	1.3	0.6	11.1	1.4		18.3	0.0	0.1	0.5	0.8	5.1
Delay (s)	75.3	22.7	13.0	81.2	24.0		74.6	63.4	63.6	62.2	72.0	77.2
Level of Service	E	C	B	F	C		E	E	E	E	E	E
Approach Delay (s)		23.4			27.1			71.0			72.9	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			32.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			160.0			Sum of lost time (s)			21.0			
Intersection Capacity Utilization			83.1%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

2016PM Existing_Hillsboro Blvd.syn

Queues

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

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	292	2172	89	302	1313	297	167	797	594	448	557	260
v/c Ratio	0.83	0.94	0.11	1.13	0.86	0.38	0.58	0.95	1.26	1.09	0.58	0.47
Control Delay	99.3	55.1	2.7	163.6	53.0	16.0	87.2	88.4	176.1	140.9	59.8	22.0
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	99.3	55.1	2.7	163.6	53.0	16.0	87.2	88.4	176.1	140.9	59.8	22.0
Queue Length 50th (ft)	177	886	0	-211	735	99	100	494	-760	-305	301	87
Queue Length 95th (ft)	#248	952	23	#318	837	182	140	#625	#1012	#426	380	188
Internal Link Dist (ft)		1380			1200			569			457	
Turn Bay Length (ft)	280		500	275			300		300	300		200
Base Capacity (vph)	356	2322	781	268	1532	779	411	837	470	411	964	553
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	0.82	0.94	0.11	1.13	0.86	0.38	0.41	0.95	1.26	1.09	0.58	0.47































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.

2016AM Existing_SW 10th Street.syn

HCM Signalized Intersection Capacity Analysis












5: 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)	280	2085	85	290	1260	285	160	765	570	430	535	250	
Future Volume (vph)	280	2085	85	290	1260	285	160	765	570	430	535	250	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	6.3	4.8	4.8	5.9	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	
Lane Util. Factor	0.97	0.91	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	5085	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	5085	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	292	2172	89	302	1312	297	167	797	594	448	557	260	
RTOR Reduction (vph)	0	0	48	0	0	94	0	0	96	0	0	122	
Lane Group Flow (vph)	292	2172	41	302	1313	203	167	797	498	448	557	138	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	
Protected Phases	1	6		5	2		7	4		3	8		
Permitted Phases			6			2			4			8	
Actuated Green, G (s)	16.4	80.2	80.2	12.1	75.9	75.9	13.1	40.6	40.6	19.6	47.1	47.1	
Effective Green, g (s)	18.4	82.2	82.2	14.1	77.9	77.9	15.1	42.6	42.6	21.6	49.1	49.1	
Actuated g/C Ratio	0.10	0.46	0.46	0.08	0.43	0.43	0.08	0.24	0.24	0.12	0.27	0.27	
Clearance Time (s)	8.3	6.8	6.8	7.9	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0	2.0	3.0	3.0	2.0	3.0	3.0	
Lane Grp Cap (vph)	350	2322	722	268	1531	685	287	837	374	411	965	431	
v/s Ratio Prot	0.09	c0.43		c0.09	0.37		0.05	0.23		c0.13	0.16		
v/s Ratio Perm			0.03			0.13			c0.31			0.09	
v/c Ratio	0.83	0.94	0.06	1.13	0.86	0.30	0.58	0.95	1.33	1.09	0.58	0.32	
Uniform Delay, d1	79.3	46.4	27.3	83.0	46.0	33.2	79.4	67.7	68.7	79.2	56.5	52.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	15.0	8.7	0.1	93.5	6.4	1.1	1.9	20.3	166.3	70.8	0.8	0.4	
Delay (s)	94.3	55.0	27.4	176.5	52.5	34.3	81.3	88.0	235.0	150.0	57.3	52.6	
Level of Service	F	E	C	F	D	C	F	F	F	F	E	D	
Approach Delay (s)		58.6			69.2			143.3			89.2		
Approach LOS		E			E			F			F		
Intersection Summary													
HCM 2000 Control Delay			84.8									HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			1.08										
Actuated Cycle Length (s)			180.0									Sum of lost time (s)	19.5
Intersection Capacity Utilization			99.2%									ICU Level of Service	F
Analysis Period (min)			15										

c Critical Lane Group

Queues

6: Newport Center Dr/SW 12th Avenue & SR 869/SW 10th Street



























											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	273	2907	330	1758	314	31	31	98	23	23	82
v/c Ratio	0.95	0.75	1.17	0.51	0.28	0.38	0.37	0.45	0.38	0.33	0.39
Control Delay	74.7	23.9	160.9	11.3	2.0	86.5	85.8	7.9	90.8	85.0	5.3
Queue Delay	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.7	24.0	160.9	11.4	2.0	86.5	85.8	7.9	90.8	85.0	5.3
Queue Length 50th (ft)	155	593	~410	208	10	33	33	0	25	25	0
Queue Length 95th (ft)	#361	707	#618	328	41	73	72	9	58	58	0
Internal Link Dist (ft)		700		595			420			170	
Turn Bay Length (ft)	600		550		295	100					
Base Capacity (vph)	287	3856	283	3440	1132	168	171	292	140	162	292
Starvation Cap Reductn	0	0	0	560	0	0	0	0	0	0	0
Spillback Cap Reductn	0	180	0	0	0	0	0	3	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.79	1.17	0.61	0.28	0.18	0.18	0.34	0.16	0.14	0.28

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

6: Newport Center Dr/SW 12th Avenue & SR 869/SW 10th Street

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (vph)	265	2370	450	320	1705	305	50	10	95	35	10	80
Future Volume (vph)	265	2370	450	320	1705	305	50	10	95	35	10	80
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	6.0	6.0	6.0	5.7	5.7	5.7
Lane Util. Factor	1.00	0.86		1.00	0.91	1.00	0.95	0.95	1.00	0.95	0.95	1.00
Flt	1.00	0.98		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	0.97	1.00	0.95	0.97	1.00
Satd. Flow (prot)	1736	6254		1770	5085	1524	1681	1712	1583	1225	1422	1392
Flt Permitted	0.11	1.00		0.95	1.00	1.00	0.95	0.97	1.00	0.95	0.97	1.00
Satd. Flow (perm)	192	6254		1770	5085	1524	1681	1712	1583	1225	1422	1392
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	273	2443	464	330	1758	314	52	10	98	36	10	82
RTOR Reduction (vph)	0	17	0	0	0	101	0	0	93	0	0	78
Lane Group Flow (vph)	273	2890	0	330	1758	213	31	31	5	23	23	4
Heavy Vehicles (%)	4%	2%	2%	2%	2%	6%	2%	2%	2%	40%	2%	16%
Turn Type	pm+pt	NA		Prot	NA	Perm	Split	NA	Prot	Split	NA	Prot
Protected Phases	1	6		5	2		3	3	3	4	4	4
Permitted Phases	6					2						
Actuated Green, G (s)	109.9	96.3		23.6	106.3	106.3	7.7	7.7	7.7	7.9	7.9	7.9
Effective Green, g (s)	113.9	98.3		25.6	108.3	108.3	7.7	7.7	7.7	7.9	7.9	7.9
Actuated g/C Ratio	0.71	0.61		0.16	0.68	0.68	0.05	0.05	0.05	0.05	0.05	0.05
Clearance Time (s)	6.4	6.4		6.4	6.4	6.4	6.0	6.0	6.0	5.7	5.7	5.7
Vehicle Extension (s)	1.5	3.0		2.5	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	287	3842		283	3441	1031	80	82	76	60	70	68
v/s Ratio Prot	0.09	0.46		c0.19	0.35		c0.02	0.02	0.00	c0.02	0.02	0.00
v/s Ratio Perm	c0.58					0.14						
v/c Ratio	0.95	0.75		1.17	0.51	0.21	0.39	0.38	0.06	0.38	0.33	0.06
Uniform Delay, d1	30.4	22.1		67.2	12.8	9.7	73.9	73.8	72.7	73.7	73.5	72.5
Progression Factor	1.00	1.00		1.03	0.81	1.43	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	39.7	1.4		103.4	0.5	0.4	1.1	1.1	0.1	1.5	1.0	0.1
Delay (s)	70.1	23.5		172.5	10.9	14.3	75.0	74.9	72.8	75.2	74.5	72.6
Level of Service	E	C		F	B	B	E	E	E	E	E	E
Approach Delay (s)		27.5			33.5			73.6			73.4	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			32.2				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			160.0				Sum of lost time (s)			20.5		
Intersection Capacity Utilization			80.2%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

2016AM Existing_SW 10th Street.syn

Queues

7: I-95 SB On-Ramp & SR 869/SW 10th Street

	→	↘	↙	←
Lane Group	EBT	EBR	WBL	WBT
Lane Group Flow (vph)	1968	663	579	2453
v/c Ratio	0.71	0.42	0.88	0.48
Control Delay	19.4	0.6	48.1	0.2
Queue Delay	0.1	0.0	0.0	0.0
Total Delay	19.5	0.6	48.1	0.2
Queue Length 50th (ft)	624	0	404	1
Queue Length 95th (ft)	554	0	m470	m0
Internal Link Dist (ft)	595			250
Turn Bay Length (ft)				
Base Capacity (vph)	2764	1583	659	5085
Starvation Cap Reductn	28	0	0	0
Spillback Cap Reductn	121	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.74	0.42	0.88	0.48

Intersection Summary

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

2016AM Existing_SW 10th Street.syn

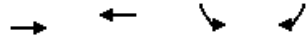
HCM Signalized Intersection Capacity Analysis

7: I-95 SB On-Ramp & SR 869/SW 10th Street

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑	↑↑↑		
Traffic Volume (vph)	1870	630	550	2330	0	0
Future Volume (vph)	1870	630	550	2330	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	2.0	4.4	2.0		
Lane Util. Factor	0.91	1.00	1.00	0.91		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	5085	1583	1770	5085		
Flt Permitted	1.00	1.00	0.05	1.00		
Satd. Flow (perm)	5085	1583	90	5085		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1968	663	579	2453	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1968	663	579	2453	0	0
Turn Type	NA	Free	D.P+P	NA		
Protected Phases	1 2 4		3 5	Free		
Permitted Phases		Free	1 2 4			
Actuated Green, G (s)	83.1	160.0	134.7	160.0		
Effective Green, g (s)	87.1	160.0	138.2	160.0		
Actuated g/C Ratio	0.54	1.00	0.86	1.00		
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)	2768	1583	661	5085		
v/s Ratio Prot	c0.39		c0.30	0.48		
v/s Ratio Perm		0.42	c0.45			
v/c Ratio	0.71	0.42	0.88	0.48		
Uniform Delay, d1	27.1	0.0	43.5	0.0		
Progression Factor	1.28	1.00	1.30	1.00		
Incremental Delay, d2	0.5	0.6	9.1	0.2		
Delay (s)	35.1	0.6	65.9	0.2		
Level of Service	D	A	E	A		
Approach Delay (s)	26.4			12.8	0.0	
Approach LOS	C			B	A	
Intersection Summary						
HCM 2000 Control Delay			19.1		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.88			
Actuated Cycle Length (s)			160.0		Sum of lost time (s)	21.8
Intersection Capacity Utilization			74.0%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

2016AM Existing_SW 10th Street.syn

Queues









Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1989	2335	494	474
v/c Ratio	0.59	0.55	1.06	1.13
Control Delay	3.9	4.9	112.4	136.6
Queue Delay	0.6	0.2	15.4	0.8
Total Delay	4.6	5.1	127.8	137.4
Queue Length 50th (ft)	4	73	~565	~604
Queue Length 95th (ft)	5	m75	#795	#846
Internal Link Dist (ft)	250	635	1117	
Turn Bay Length (ft)			500	500
Base Capacity (vph)	3384	4265	466	418
Starvation Cap Reductn	901	872	0	0
Spillback Cap Reductn	0	439	36	32
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.80	0.69	1.15	1.23

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

8: SR 869/SW 10th Street & I-95 SB Off-Ramp

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑		↘	↗
Traffic Volume (vph)	0	1870	2195	0	225	685
Future Volume (vph)	0	1870	2195	0	225	685
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5
Lane Util. Factor		0.91	0.86		1.00	0.95
Flt		1.00	1.00		0.92	0.85
Flt Protected		1.00	1.00		0.98	1.00
Satd. Flow (prot)		5085	6408		1678	1504
Flt Permitted		1.00	1.00		0.98	1.00
Satd. Flow (perm)		5085	6408		1678	1504
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1989	2335	0	239	729
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1989	2335	0	494	474
Turn Type		NA	NA		Prot	Perm
Protected Phases		2 3 4	2 3 4		1 5	
Permitted Phases						1 5
Actuated Green, G (s)		104.6	104.6		42.5	42.5
Effective Green, g (s)		102.2	102.2		40.5	40.5
Actuated g/C Ratio		0.64	0.64		0.25	0.25
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		3248	4093		424	380
v/s Ratio Prot		c0.39	0.36		0.29	
v/s Ratio Perm						c0.32
v/c Ratio		0.61	0.57		1.17	1.25
Uniform Delay, d1		17.1	16.4		59.8	59.8
Progression Factor		0.23	0.33		1.00	1.00
Incremental Delay, d2		0.2	0.1		97.2	131.5
Delay (s)		4.1	5.4		156.9	191.3
Level of Service		A	A		F	F
Approach Delay (s)		4.1	5.4		173.8	
Approach LOS		A	A		F	
Intersection Summary						
HCM 2000 Control Delay			35.7		HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.82			
Actuated Cycle Length (s)			160.0		Sum of lost time (s)	21.8
Intersection Capacity Utilization			70.1%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

2016AM Existing_SW 10th Street.syn

Queues

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1070	1183	280	1726	733	331
v/c Ratio	0.52	0.75	1.30	0.70	1.03	1.10
Control Delay	23.3	18.4	206.0	25.8	101.6	136.5
Queue Delay	0.3	0.0	0.0	0.1	0.0	0.0
Total Delay	23.7	18.4	206.0	26.0	101.6	136.5
Queue Length 50th (ft)	275	958	~377	554	~420	~428
Queue Length 95th (ft)	m348	m1066	m#547	m300	#551	#653
Internal Link Dist (ft)	635			630	537	
Turn Bay Length (ft)			275		200	200
Base Capacity (vph)	2068	1583	216	2463	713	302
Starvation Cap Reductn	431	0	0	98	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.75	1.30	0.73	1.03	1.10

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












9: I-95 NB On/Off-Ramp & SR 869/SW 10th Street

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑↑	↑↑	↑
Traffic Volume (vph)	995	1100	260	1605	590	400
Future Volume (vph)	995	1100	260	1605	590	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	2.0	4.4	4.5	4.4	4.4
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	0.91
Frt	1.00	0.85	1.00	1.00	0.98	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.96	1.00
Satd. Flow (prot)	3539	1583	1770	5085	3394	1441
Flt Permitted	1.00	1.00	0.95	1.00	0.96	1.00
Satd. Flow (perm)	3539	1583	1770	5085	3394	1441
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1070	1183	280	1726	634	430
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1070	1183	280	1726	733	331
Turn Type	NA	Free	Prot	NA	Prot	Prot
Protected Phases	1 2 5		3	1 2 3	4	4
Permitted Phases		Free				
Actuated Green, G (s)	91.5	160.0	17.6	75.6	31.6	31.6
Effective Green, g (s)	89.5	160.0	19.6	77.6	33.6	33.6
Actuated g/C Ratio	0.56	1.00	0.12	0.48	0.21	0.21
Clearance Time (s)			6.4		6.4	6.4
Vehicle Extension (s)			2.0		3.5	3.5
Lane Grp Cap (vph)	1979	1583	216	2466	712	302
v/s Ratio Prot	0.30		c0.16	0.34	0.22	c0.23
v/s Ratio Perm		c0.75				
v/c Ratio	0.54	0.75	1.30	0.70	1.03	1.10
Uniform Delay, d1	22.3	0.0	70.2	32.1	63.2	63.2
Progression Factor	1.13	1.00	0.89	0.75	1.00	1.00
Incremental Delay, d2	0.1	2.5	158.3	0.6	41.5	80.0
Delay (s)	25.3	2.5	221.0	24.8	104.7	143.2
Level of Service	C	A	F	C	F	F
Approach Delay (s)	13.4			52.2	116.7	
Approach LOS	B			D	F	
Intersection Summary						
HCM 2000 Control Delay			48.6		HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.98			
Actuated Cycle Length (s)			160.0		Sum of lost time (s)	21.8
Intersection Capacity Utilization			76.3%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

2016AM Existing_SW 10th Street.syn

Queues

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

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	167	1333	86	1500	75	210	134	113	231	156	296
v/c Ratio	0.56	0.42	0.30	0.49	0.07	1.11	0.32	0.39	0.92	0.71	0.88
Control Delay	16.9	18.1	10.5	19.0	1.3	149.6	65.0	13.4	100.6	83.8	55.0
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	16.9	18.1	10.5	19.0	1.3	149.6	65.0	13.4	100.6	83.8	55.0
Queue Length 50th (ft)	51	190	24	311	0	~227	68	0	223	160	138
Queue Length 95th (ft)	m143	m353	50	402	13	#350	98	58	#298	229	245
Internal Link Dist (ft)		630		1233			420			420	
Turn Bay Length (ft)	140		200		200	185		185	170		
Base Capacity (vph)	310	3211	366	3086	1000	190	603	363	250	317	410
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	0.54	0.42	0.23	0.49	0.07	1.11	0.22	0.31	0.92	0.49	0.72




























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.

2016AM Existing_SW 10th Street.syn

HCM Signalized Intersection Capacity Analysis













10: 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)	155	1040	200	80	1395	70	195	125	105	215	145	275
Future Volume (vph)	155	1040	200	80	1395	70	195	125	105	215	145	275
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	5.7	5.7	5.7	5.7	5.7	5.7
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Flt	1.00	0.98		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	1.00	1.00
Satd. Flow (prot)	1770	4962		1770	5085	1583	1770	3539	1583	1770	1863	1583
Flt Permitted	0.12	1.00		0.17	1.00	1.00	0.39	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	220	4962		320	5085	1583	733	3539	1583	1239	1863	1583
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	167	1118	215	86	1500	75	210	134	113	231	156	296
RTOR Reduction (vph)	0	14	0	0	0	29	0	0	100	0	0	149
Lane Group Flow (vph)	167	1319	0	86	1500	46	210	134	13	231	156	147
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2	4		4	8		8
Actuated Green, G (s)	113.3	101.0		101.5	95.1	95.1	28.4	19.1	19.1	28.4	19.1	19.1
Effective Green, g (s)	115.8	103.0		105.5	97.1	97.1	28.4	19.1	19.1	28.4	19.1	19.1
Actuated g/C Ratio	0.72	0.64		0.66	0.61	0.61	0.18	0.12	0.12	0.18	0.12	0.12
Clearance Time (s)	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		1.5	3.0	3.0	1.5	2.0	2.0	1.5	2.0	2.0
Lane Grp Cap (vph)	297	3194		287	3085	960	190	422	188	250	222	188
v/s Ratio Prot	c0.05	0.27		0.02	0.29		c0.06	0.04		0.05	0.08	
v/s Ratio Perm	c0.36			0.18		0.03	c0.13		0.01	0.11		0.09
v/c Ratio	0.56	0.41		0.30	0.49	0.05	1.11	0.32	0.07	0.92	0.70	0.78
Uniform Delay, d1	12.1	13.8		10.2	17.5	12.7	64.5	64.5	62.6	63.5	67.7	68.4
Progression Factor	1.21	1.26		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	0.3		0.2	0.6	0.1	96.3	0.2	0.1	36.3	8.0	17.6
Delay (s)	15.7	17.7		10.5	18.1	12.8	160.8	64.6	62.6	99.8	75.7	86.0
Level of Service	B	B		B	B	B	F	E	E	F	E	F
Approach Delay (s)		17.5			17.5			108.3			88.3	
Approach LOS		B			B			F			F	
Intersection Summary												
HCM 2000 Control Delay			38.4	HCM 2000 Level of Service				D				
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			160.0	Sum of lost time (s)				20.2				
Intersection Capacity Utilization			70.8%	ICU Level of Service				C				
Analysis Period (min)			15									

c Critical Lane Group

Queues

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


































												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	318	1490	161	365	2104	443	141	604	313	229	818	453
v/c Ratio	1.14	0.69	0.21	0.77	1.24	0.53	0.77	0.74	0.60	0.66	0.83	0.82
Control Delay	164.8	45.4	2.2	69.7	158.4	34.8	109.7	70.9	24.5	86.7	69.2	51.2
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	164.8	45.4	2.2	69.7	158.4	34.8	109.7	70.9	24.5	86.7	69.2	51.2
Queue Length 50th (ft)	~224	542	0	218	~1634	318	86	346	104	136	472	337
Queue Length 95th (ft)	#332	615	24	m267	m#1715	m407	#142	434	223	181	555	492
Internal Link Dist (ft)		880			1200			569			457	
Turn Bay Length (ft)	280		500	275			300		300	300		200
Base Capacity (vph)	280	2149	782	535	1694	843	183	815	526	431	1034	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	1.14	0.69	0.21	0.68	1.24	0.53	0.77	0.74	0.60	0.53	0.79	0.79

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












5: 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)	305	1430	155	350	2020	425	135	580	300	220	785	435	
Future Volume (vph)	305	1430	155	350	2020	425	135	580	300	220	785	435	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	6.3	4.8	4.8	5.9	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	
Lane Util. Factor	0.97	0.91	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	5085	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	5085	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	318	1490	161	365	2104	443	141	604	312	229	818	453	
RTOR Reduction (vph)	0	0	93	0	0	85	0	0	163	0	0	116	
Lane Group Flow (vph)	318	1490	68	365	2104	358	141	604	150	229	818	337	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	
Protected Phases	1	6		5	2		7	4		3	8		
Permitted Phases			6			2			4			8	
Actuated Green, G (s)	12.7	74.1	74.1	22.8	84.2	84.2	7.6	39.3	39.3	16.3	48.0	48.0	
Effective Green, g (s)	14.7	76.1	76.1	24.8	86.2	86.2	9.6	41.3	41.3	18.3	50.0	50.0	
Actuated g/C Ratio	0.08	0.42	0.42	0.14	0.48	0.48	0.05	0.23	0.23	0.10	0.28	0.28	
Clearance Time (s)	8.3	6.8	6.8	7.9	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0	2.0	3.0	3.0	2.0	3.0	3.0	
Lane Grp Cap (vph)	280	2149	669	472	1694	758	183	812	363	349	983	439	
v/s Ratio Prot	c0.09	0.29		0.11	c0.59		0.04	0.17		c0.07	c0.23		
v/s Ratio Perm			0.04			0.23			0.09			0.21	
v/c Ratio	1.14	0.69	0.10	0.77	1.24	0.47	0.77	0.74	0.41	0.66	0.83	0.77	
Uniform Delay, d1	82.7	42.4	31.3	74.9	46.9	31.6	84.1	64.4	59.1	77.8	61.1	59.7	
Progression Factor	1.00	1.00	1.00	0.84	1.22	1.66	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	95.5	1.9	0.3	4.1	111.9	1.2	16.5	3.7	0.8	3.4	6.1	7.9	
Delay (s)	178.1	44.3	31.6	67.1	169.1	53.6	100.6	68.2	59.8	81.2	67.2	67.6	
Level of Service	F	D	C	E	F	D	F	E	E	F	E	E	
Approach Delay (s)		64.9			138.7			70.0			69.4		
Approach LOS		E			F			E			E		
Intersection Summary													
HCM 2000 Control Delay			95.4									HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			1.08										
Actuated Cycle Length (s)			180.0									Sum of lost time (s)	19.5
Intersection Capacity Utilization			106.7%									ICU Level of Service	G
Analysis Period (min)			15										

c Critical Lane Group

Queues

6: Newport Center Dr/SW 12th Avenue & SR 869/SW 10th Street





























											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	68	1964	94	2234	73	165	168	391	47	47	354
v/c Ratio	0.62	0.60	0.61	0.80	0.09	0.61	0.62	0.95	0.24	0.24	1.11
Control Delay	76.0	15.9	103.5	19.6	0.6	79.8	80.2	70.8	74.1	73.9	123.1
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.0	15.9	103.5	20.0	0.6	79.8	80.2	70.8	74.1	73.9	123.1
Queue Length 50th (ft)	42	135	109	521	0	188	192	252	53	53	~328
Queue Length 95th (ft)	m87	158	175	560	6	278	284	#443	102	102	#548
Internal Link Dist (ft)		700		595			420			170	
Turn Bay Length (ft)	600		550		295	100					
Base Capacity (vph)	114	3250	182	2804	796	308	309	444	194	198	320
Starvation Cap Reductn	0	0	0	155	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	0.60	0.60	0.52	0.84	0.09	0.54	0.54	0.88	0.24	0.24	1.11

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

6: Newport Center Dr/SW 12th Avenue & SR 869/SW 10th Street

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  						 	
Traffic Volume (vph)	65	1825	60	90	2145	70	310	10	375	85	5	340
Future Volume (vph)	65	1825	60	90	2145	70	310	10	375	85	5	340
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	6.0	6.0	6.0	5.7	5.7	5.7
Lane Util. Factor	1.00	0.86		1.00	0.91	1.00	0.95	0.95	1.00	0.95	0.95	1.00
Flt	1.00	1.00		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	0.96	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1597	6377		1770	5085	1369	1681	1690	1583	1504	1533	1568
Flt Permitted	0.04	1.00		0.95	1.00	1.00	0.95	0.96	1.00	0.95	0.96	1.00
Satd. Flow (perm)	73	6377		1770	5085	1369	1681	1690	1583	1504	1533	1568
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	68	1901	62	94	2234	73	323	10	391	89	5	354
RTOR Reduction (vph)	0	2	0	0	0	33	0	0	159	0	0	118
Lane Group Flow (vph)	68	1962	0	94	2234	40	165	168	232	47	47	236
Heavy Vehicles (%)	13%	2%	2%	2%	2%	18%	2%	2%	2%	14%	2%	3%
Turn Type	pm+pt	NA		Prot	NA	Perm	Split	NA	Prot	Split	NA	Prot
Protected Phases	1	6		5	2		3	3	3	4	4	4
Permitted Phases	6					2						
Actuated Green, G (s)	95.8	89.7		13.7	97.3	97.3	28.8	28.8	28.8	23.3	23.3	23.3
Effective Green, g (s)	99.8	91.7		15.7	99.3	99.3	28.8	28.8	28.8	23.3	23.3	23.3
Actuated g/C Ratio	0.55	0.51		0.09	0.55	0.55	0.16	0.16	0.16	0.13	0.13	0.13
Clearance Time (s)	6.4	6.4		6.4	6.4	6.4	6.0	6.0	6.0	5.7	5.7	5.7
Vehicle Extension (s)	1.5	3.0		2.5	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	109	3248		154	2805	755	268	270	253	194	198	202
v/s Ratio Prot	0.03	0.31		c0.05	c0.44		0.10	0.10	c0.15	0.03	0.03	c0.15
v/s Ratio Perm	0.32					0.03						
v/c Ratio	0.62	0.60		0.61	0.80	0.05	0.62	0.62	0.92	0.24	0.24	1.17
Uniform Delay, d1	32.1	31.3		79.2	32.3	18.6	70.4	70.5	74.4	70.4	70.4	78.3
Progression Factor	1.78	0.47		1.12	0.52	0.25	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.8	0.6		5.4	2.2	0.1	2.9	3.2	34.5	0.2	0.2	116.9
Delay (s)	62.9	15.4		94.2	19.0	4.7	73.4	73.7	108.9	70.7	70.6	195.3
Level of Service	E	B		F	B	A	E	E	F	E	E	F
Approach Delay (s)		17.0			21.5			92.7			169.1	
Approach LOS		B			C			F			F	
Intersection Summary												
HCM 2000 Control Delay			40.9				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			180.0				Sum of lost time (s)			20.5		
Intersection Capacity Utilization			84.8%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

2016PM Existing_SW 10th Street.syn

Queues

7: I-95 SB On-Ramp & SR 869/SW 10th Street

	→	↘	↙	←
Lane Group	EBT	EBR	WBL	WBT
Lane Group Flow (vph)	1747	658	574	2426
v/c Ratio	0.78	0.42	0.67	0.48
Control Delay	18.4	2.2	22.5	0.2
Queue Delay	0.6	0.0	0.0	0.0
Total Delay	19.0	2.2	22.5	0.2
Queue Length 50th (ft)	220	29	373	0
Queue Length 95th (ft)	301	m51	m416	m0
Internal Link Dist (ft)	595			250
Turn Bay Length (ft)				
Base Capacity (vph)	2231	1583	862	5085
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	172	0	0	67
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.85	0.42	0.67	0.48

Intersection Summary

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

2016PM Existing_SW 10th Street.syn

HCM Signalized Intersection Capacity Analysis

7: I-95 SB On-Ramp & SR 869/SW 10th Street

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑	↑↑↑		
Traffic Volume (vph)	1660	625	545	2305	0	0
Future Volume (vph)	1660	625	545	2305	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	2.0	4.4	2.0		
Lane Util. Factor	0.91	1.00	1.00	0.91		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	5085	1583	1770	5085		
Flt Permitted	1.00	1.00	0.05	1.00		
Satd. Flow (perm)	5085	1583	100	5085		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1747	658	574	2426	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1747	658	574	2426	0	0
Turn Type	NA	Free	D.P+P	NA		
Protected Phases	1 2 4		3 5	Free		
Permitted Phases		Free	1 2 4			
Actuated Green, G (s)	75.1	180.0	154.7	180.0		
Effective Green, g (s)	79.1	180.0	158.2	180.0		
Actuated g/C Ratio	0.44	1.00	0.88	1.00		
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)	2234	1583	863	5085		
v/s Ratio Prot	c0.34		c0.31	0.48		
v/s Ratio Perm		0.42	0.28			
v/c Ratio	0.78	0.42	0.67	0.48		
Uniform Delay, d1	43.1	0.0	32.7	0.0		
Progression Factor	0.75	1.00	1.20	1.00		
Incremental Delay, d2	1.3	0.6	1.1	0.2		
Delay (s)	33.5	0.6	40.4	0.2		
Level of Service	C	A	D	A		
Approach Delay (s)	24.5			7.9	0.0	
Approach LOS	C			A	A	
Intersection Summary						
HCM 2000 Control Delay			15.3		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.74			
Actuated Cycle Length (s)			180.0		Sum of lost time (s)	21.8
Intersection Capacity Utilization			69.7%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

2016PM Existing_SW 10th Street.syn

Queues

8: SR 869/SW 10th Street & I-95 SB Off-Ramp

	→	←	↘	↙
Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1785	2177	526	506
v/c Ratio	0.53	0.51	1.12	1.18
Control Delay	4.7	8.0	136.2	155.0
Queue Delay	2.9	0.2	0.0	0.0
Total Delay	7.6	8.2	136.2	155.0
Queue Length 50th (ft)	446	91	~714	~748
Queue Length 95th (ft)	23	m86	#958	#1001
Internal Link Dist (ft)	250	635	1117	
Turn Bay Length (ft)			500	500
Base Capacity (vph)	3375	4254	468	430
Starvation Cap Reductn	1443	900	0	0
Spillback Cap Reductn	0	250	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.92	0.65	1.12	1.18







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.

2016PM Existing_SW 10th Street.syn

HCM Signalized Intersection Capacity Analysis

8: SR 869/SW 10th Street & I-95 SB Off-Ramp

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑		↘	↗
Traffic Volume (vph)	0	1660	2025	0	135	825
Future Volume (vph)	0	1660	2025	0	135	825
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5
Lane Util. Factor		0.91	0.86		1.00	0.95
Flt		1.00	1.00		0.89	0.85
Flt Protected		1.00	1.00		0.99	1.00
Satd. Flow (prot)		5085	6408		1638	1504
Flt Permitted		1.00	1.00		0.99	1.00
Satd. Flow (perm)		5085	6408		1638	1504
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	1785	2177	0	145	887
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1785	2177	0	526	506
Turn Type		NA	NA		Prot	Perm
Protected Phases		2 3 4	2 3 4		1 5	
Permitted Phases						1 5
Actuated Green, G (s)		117.6	117.6		49.5	49.5
Effective Green, g (s)		115.2	115.2		47.5	47.5
Actuated g/C Ratio		0.64	0.64		0.26	0.26
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)		3254	4101		432	396
v/s Ratio Prot		c0.35	0.34		0.32	
v/s Ratio Perm						c0.34
v/c Ratio		0.55	0.53		1.22	1.28
Uniform Delay, d1		18.0	17.7		66.2	66.2
Progression Factor		0.27	0.50		1.00	1.00
Incremental Delay, d2		0.1	0.0		117.4	143.2
Delay (s)		5.0	8.9		183.6	209.5
Level of Service		A	A		F	F
Approach Delay (s)		5.0	8.9		196.3	
Approach LOS		A	A		F	
Intersection Summary						
HCM 2000 Control Delay			46.2		HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.78			
Actuated Cycle Length (s)			180.0		Sum of lost time (s)	21.8
Intersection Capacity Utilization			70.9%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

2016PM Existing_SW 10th Street.syn

Queues

9: I-95 NB On/Off-Ramp & SR 869/SW 10th Street

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1064	846	314	1484	890	408
v/c Ratio	0.60	0.53	0.75	0.57	1.42	1.52
Control Delay	38.4	7.9	76.3	31.1	247.7	298.3
Queue Delay	0.9	0.0	0.0	0.9	0.0	0.0
Total Delay	39.3	7.9	76.3	32.0	247.7	298.3
Queue Length 50th (ft)	434	474	348	434	~727	~735
Queue Length 95th (ft)	m508	m467	472	479	#863	#984
Internal Link Dist (ft)	635			630	537	
Turn Bay Length (ft)			275		200	200
Base Capacity (vph)	1779	1583	418	2613	626	268
Starvation Cap Reductn	410	0	0	772	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.53	0.75	0.81	1.42	1.52

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.

2016PM Existing_SW 10th Street.syn

HCM Signalized Intersection Capacity Analysis












9: I-95 NB On/Off-Ramp & SR 869/SW 10th Street

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑↑	↑↑	↑
Traffic Volume (vph)	1000	795	295	1395	630	590
Future Volume (vph)	1000	795	295	1395	630	590
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	2.0	4.4	4.5	4.4	4.4
Lane Util. Factor	0.95	1.00	1.00	0.91	0.97	0.91
Frt	1.00	0.85	1.00	1.00	0.96	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.96	1.00
Satd. Flow (prot)	3539	1583	1770	5085	3354	1441
Flt Permitted	1.00	1.00	0.95	1.00	0.96	1.00
Satd. Flow (perm)	3539	1583	1770	5085	3354	1441
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1064	846	314	1484	670	628
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1064	846	314	1484	890	408
Turn Type	NA	Free	Prot	NA	Prot	Prot
Protected Phases	1 2 5		3	1 2 3	4	4
Permitted Phases		Free				
Actuated Green, G (s)	88.5	180.0	40.6	90.6	31.6	31.6
Effective Green, g (s)	86.5	180.0	42.6	92.6	33.6	33.6
Actuated g/C Ratio	0.48	1.00	0.24	0.51	0.19	0.19
Clearance Time (s)			6.4		6.4	6.4
Vehicle Extension (s)			2.0		3.5	3.5
Lane Grp Cap (vph)	1700	1583	418	2615	626	268
v/s Ratio Prot	c0.30		c0.18	0.29	0.27	c0.28
v/s Ratio Perm		c0.53				
v/c Ratio	0.63	0.53	0.75	0.57	1.42	1.52
Uniform Delay, d1	34.7	0.0	63.8	30.0	73.2	73.2
Progression Factor	1.16	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	1.1	6.6	0.2	199.0	253.2
Delay (s)	40.6	1.1	70.4	30.1	272.2	326.4
Level of Service	D	A	E	C	F	F
Approach Delay (s)	23.1			37.2	289.3	
Approach LOS	C			D	F	
Intersection Summary						
HCM 2000 Control Delay			97.2		HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			0.87			
Actuated Cycle Length (s)			180.0		Sum of lost time (s)	21.8
Intersection Capacity Utilization			79.2%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

2016PM Existing_SW 10th Street.syn

Queues

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

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	223	1468	181	1197	112	250	112	90	234	234	351
v/c Ratio	0.62	0.50	0.67	0.41	0.12	1.51	0.21	0.28	0.81	0.85	0.90
Control Delay	17.5	19.8	24.2	20.0	3.0	293.7	59.9	8.4	77.5	93.0	56.2
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	20.2	24.2	20.0	3.0	293.7	59.9	8.4	77.5	93.0	56.2
Queue Length 50th (ft)	79	314	62	257	0	~280	54	0	213	239	179
Queue Length 95th (ft)	119	387	117	301	31	#454	85	38	301	#338	#338
Internal Link Dist (ft)		630		1233			420			420	
Turn Bay Length (ft)	140		200		200	185		185	170		
Base Capacity (vph)	364	2964	311	2919	956	166	603	358	290	317	424
Starvation Cap Reductn	0	803	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	0.61	0.68	0.58	0.41	0.12	1.51	0.19	0.25	0.81	0.74	0.83




























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.

2016PM Existing_SW 10th Street.syn

HCM Signalized Intersection Capacity Analysis

10: 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)	210	1200	180	170	1125	105	235	105	85	220	220	330
Future Volume (vph)	210	1200	180	170	1125	105	235	105	85	220	220	330
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	5.7	5.7	5.7	5.7	5.7	5.7
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Flt	1.00	0.98		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	1.00	1.00
Satd. Flow (prot)	1770	4986		1770	5085	1583	1770	3539	1583	1770	1863	1583
Flt Permitted	0.18	1.00		0.13	1.00	1.00	0.23	1.00	1.00	0.68	1.00	1.00
Satd. Flow (perm)	326	4986		243	5085	1583	431	3539	1583	1269	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	223	1277	191	181	1197	112	250	112	90	234	234	351
RTOR Reduction (vph)	0	11	0	0	0	48	0	0	77	0	0	159
Lane Group Flow (vph)	223	1457	0	181	1197	64	250	112	13	234	234	192
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2	4		4	8		8
Actuated Green, G (s)	105.8	92.8		100.0	89.9	89.9	32.9	23.6	23.6	32.9	23.6	23.6
Effective Green, g (s)	109.8	94.8		104.0	91.9	91.9	32.9	23.6	23.6	32.9	23.6	23.6
Actuated g/C Ratio	0.69	0.59		0.65	0.57	0.57	0.21	0.15	0.15	0.21	0.15	0.15
Clearance Time (s)	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		1.5	3.0	3.0	1.5	2.0	2.0	1.5	2.0	2.0
Lane Grp Cap (vph)	359	2954		273	2920	909	166	522	233	290	274	233
v/s Ratio Prot	c0.06	0.29		0.05	0.24		c0.09	0.03		0.05	0.13	
v/s Ratio Perm	0.37			c0.38		0.04	c0.22		0.01	0.12		0.12
v/c Ratio	0.62	0.49		0.66	0.41	0.07	1.51	0.21	0.06	0.81	0.85	0.83
Uniform Delay, d1	11.8	18.8		14.0	19.0	15.1	60.8	60.0	58.6	59.2	66.5	66.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	0.6		4.6	0.4	0.2	256.4	0.1	0.0	14.3	21.2	19.8
Delay (s)	14.2	19.4		18.7	19.4	15.3	317.2	60.1	58.7	73.4	87.7	86.0
Level of Service	B	B		B	B	B	F	E	E	E	F	F
Approach Delay (s)		18.7			19.0			202.0			82.9	
Approach LOS		B			B			F			F	
Intersection Summary												
HCM 2000 Control Delay			49.2				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			160.0				Sum of lost time (s)			20.2		
Intersection Capacity Utilization			78.0%				ICU Level of Service			D		
Analysis Period (min)			15									

c Critical Lane Group

Queues

1: NW 5th Terr & Sample Road

	→	↙	←	↘	↗
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	2151	145	1656	140	183
v/c Ratio	0.45	0.66	0.41	0.73	0.55
Control Delay	15.6	83.5	2.0	89.2	14.1
Queue Delay	0.0	9.1	0.1	0.0	0.0
Total Delay	15.6	92.6	2.1	89.2	14.1
Queue Length 50th (ft)	268	103	53	145	0
Queue Length 95th (ft)	329	191	33	213	74
Internal Link Dist (ft)	575		175	531	
Turn Bay Length (ft)					
Base Capacity (vph)	4753	221	4053	431	524
Starvation Cap Reductn	0	48	716	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.84	0.50	0.32	0.35
Intersection Summary					

2016AM Existing_Sample Road.syn

HCM Signalized Intersection Capacity Analysis







1: NW 5th Terr & Sample Road

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	>		>	>	>	>
Traffic Volume (vph)	1900	100	135	1540	130	170
Future Volume (vph)	1900	100	135	1540	130	170
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	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	2043	108	145	1656	140	183
RTOR Reduction (vph)	4	0	0	0	0	163
Lane Group Flow (vph)	2147	0	145	1656	140	20
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2 3		1	1 2 3	4	
Permitted Phases					4	4
Actuated Green, G (s)	99.5		18.0	125.5	17.5	17.5
Effective Green, g (s)	101.5		20.0	127.5	17.5	17.5
Actuated g/C Ratio	0.63		0.12	0.80	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)	4749		221	4052	193	173
v/s Ratio Prot	c0.29		c0.08	0.33	c0.08	
v/s Ratio Perm						0.01
v/c Ratio	0.45		0.66	0.41	0.73	0.12
Uniform Delay, d1	15.0		66.7	4.9	68.9	64.3
Progression Factor	1.00		1.04	0.33	1.00	1.00
Incremental Delay, d2	0.0		5.0	0.0	10.9	0.1
Delay (s)	15.0		74.2	1.6	79.8	64.4
Level of Service	B		E	A	E	E
Approach Delay (s)	15.0			7.5	71.1	
Approach LOS	B			A	E	
Intersection Summary						
HCM 2000 Control Delay			16.1		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.54			
Actuated Cycle Length (s)			160.0		Sum of lost time (s)	27.0
Intersection Capacity Utilization			55.5%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

2016AM Existing_Sample Road.syn

Queues


















2: Sample Road & NW 5th Ave

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	87	2163	1663	76	245	158
v/c Ratio	0.56	0.42	0.39	0.07	0.66	0.50
Control Delay	70.1	2.1	19.4	8.0	76.2	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.1	2.1	19.4	8.0	76.2	14.0
Queue Length 50th (ft)	89	27	321	16	129	0
Queue Length 95th (ft)	155	46	362	43	169	68
Internal Link Dist (ft)		175	1004		271	
Turn Bay Length (ft)				450		
Base Capacity (vph)	154	5108	4307	1088	836	505
Starvation Cap Reductn	0	570	0	0	0	0
Spillback Cap Reductn	0	0	28	0	0	3
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.48	0.39	0.07	0.29	0.31
Intersection Summary						

2016AM Existing_Sample Road.syn

HCM Signalized Intersection Capacity Analysis

2: Sample Road & NW 5th Ave

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		  	  		 	
Traffic Volume (vph)	80	1990	1530	70	225	145
Future Volume (vph)	80	1990	1530	70	225	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)	87	2163	1663	76	245	158
RTOR Reduction (vph)	0	0	0	25	0	141
Lane Group Flow (vph)	87	2163	1663	51	245	17
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	125.5	105.5	105.5	17.5	17.5
Effective Green, g (s)	14.0	127.5	107.5	107.5	17.5	17.5
Actuated g/C Ratio	0.09	0.80	0.67	0.67	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)	154	5106	4305	1063	375	173
v/s Ratio Prot	c0.05	c0.34	0.26		c0.07	
v/s Ratio Perm				0.03		0.01
v/c Ratio	0.56	0.42	0.39	0.05	0.65	0.10
Uniform Delay, d1	70.1	5.0	11.6	8.9	68.3	64.2
Progression Factor	0.81	0.35	1.60	3.69	1.00	1.00
Incremental Delay, d2	2.6	0.0	0.0	0.0	3.1	0.1
Delay (s)	59.1	1.7	18.6	32.8	71.4	64.3
Level of Service	E	A	B	C	E	E
Approach Delay (s)		4.0	19.2		68.6	
Approach LOS		A	B		E	
Intersection Summary						
HCM 2000 Control Delay			15.9		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.50			
Actuated Cycle Length (s)			160.0		Sum of lost time (s)	27.0
Intersection Capacity Utilization			50.5%		ICU Level of Service	A
Analysis Period (min)			15			

c Critical Lane Group

Queues












3: Sample Road & I-95 SB Ramp

	→	↘	←	↙	↘
Lane Group	EBT	EBR	WBT	SBL2	SBR
Lane Group Flow (vph)	1468	888	1261	399	441
v/c Ratio	0.37	0.56	0.40	0.48	0.65
Control Delay	9.9	6.2	10.1	27.2	31.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.9	6.2	10.1	27.2	31.4
Queue Length 50th (ft)	142	226	208	88	113
Queue Length 95th (ft)	198	366	225	118	151
Internal Link Dist (ft)	1004		259		
Turn Bay Length (ft)		250			
Base Capacity (vph)	3961	1583	3143	1051	853
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	0.56	0.40	0.38	0.52
Intersection Summary					

2016AM Existing_Sample Road.syn

HCM Signalized Intersection Capacity Analysis

3: Sample Road & I-95 SB Ramp

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR	
Lane Configurations		↑↑↑	↗		↑↑↑		↘		↗			
Traffic Volume (vph)	0	1380	835	0	1185	0	375	0	415	0	0	
Future Volume (vph)	0	1380	835	0	1185	0	375	0	415	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			
Fr _t		1.00	0.85		1.00		1.00		0.85			
Fl _t Protected		1.00	1.00		1.00		0.95		1.00			
Satd. Flow (prot)		6408	1583		5085		3433		2787			
Fl _t Permitted		1.00	1.00		1.00		0.95		1.00			
Satd. Flow (perm)		6408	1583		5085		3433		2787			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Adj. Flow (vph)	0	1468	888	0	1261	0	399	0	441	0	0	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	1468	888	0	1261	0	399	0	441	0	0	
Turn Type		NA	Free		NA		Prot		Prot			
Protected Phases		6			2		3		3			
Permitted Phases			Free									
Actuated Green, G (s)		47.5	80.0		47.5		17.5		17.5			
Effective Green, g (s)		49.5	80.0		49.5		19.5		19.5			
Actuated g/C Ratio		0.62	1.00		0.62		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)		3964	1583		3146		836		679			
v/s Ratio Prot		0.23			0.25		0.12		0.16			
v/s Ratio Perm			c0.56									
v/c Ratio		0.37	0.56		0.40		0.48		0.65			
Uniform Delay, d ₁		7.5	0.0		7.7		25.9		27.2			
Progression Factor		1.21	1.00		1.20		1.00		1.00			
Incremental Delay, d ₂		0.2	1.3		0.3		0.3		1.9			
Delay (s)		9.4	1.3		9.6		26.2		29.1			
Level of Service		A	A		A		C		C			
Approach Delay (s)		6.3			9.6			27.7		0.0		
Approach LOS		A			A			C		A		
Intersection Summary												
HCM 2000 Control Delay			11.3								HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			80.0								Sum of lost time (s)	11.0
Intersection Capacity Utilization			54.4%								ICU Level of Service	A
Analysis Period (min)			15									

c Critical Lane Group

2016AM Existing_Sample Road.syn

Queues













	→	←	↖	↗	
Lane Group	EBT	WBT	WBR	NBL2	NBR
Lane Group Flow (vph)	1042	1674	447	442	305
v/c Ratio	0.32	0.51	0.28	0.60	0.51
Control Delay	9.1	6.4	0.3	31.3	30.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	6.4	0.3	31.3	30.2
Queue Length 50th (ft)	139	94	0	103	77
Queue Length 95th (ft)	191	100	m0	137	109
Internal Link Dist (ft)	270	1155			
Turn Bay Length (ft)			250		
Base Capacity (vph)	3289	3289	1583	1051	853
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	0.32	0.51	0.28	0.42	0.36

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis











4: I-95 NB Ramp & Sample Road

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	
Lane Configurations		↑↑↑			↑↑↑	↑	↑↑		↑↑			
Traffic Volume (vph)	0	990	0	0	1590	425	420	0	290	0	0	
Future Volume (vph)	0	990	0	0	1590	425	420	0	290	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	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	0	1042	0	0	1674	447	442	0	305	0	0	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	1042	0	0	1674	447	442	0	305	0	0	
Turn Type		NA			NA	Free	Prot		Prot			
Protected Phases		6			2		4		4			
Permitted Phases						Free						
Actuated Green, G (s)		49.8			49.8	80.0	15.2		15.2			
Effective Green, g (s)		51.8			51.8	80.0	17.2		17.2			
Actuated g/C Ratio		0.65			0.65	1.00	0.21		0.21			
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)		3292			3292	1583	738		599			
v/s Ratio Prot		0.20			c0.33		c0.13		0.11			
v/s Ratio Perm						0.28						
v/c Ratio		0.32			0.51	0.28	0.60		0.51			
Uniform Delay, d1		6.3			7.4	0.0	28.3		27.7			
Progression Factor		1.35			0.77	1.00	1.00		1.00			
Incremental Delay, d2		0.2			0.4	0.3	1.1		0.5			
Delay (s)		8.7			6.1	0.3	29.4		28.2			
Level of Service		A			A	A	C		C			
Approach Delay (s)		8.7			4.9			28.9		0.0		
Approach LOS		A			A			C		A		
Intersection Summary												
HCM 2000 Control Delay			10.5								HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			80.0								Sum of lost time (s)	11.0
Intersection Capacity Utilization			50.7%								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)	371	1005	32	1537	194	210	54	75	204	484
v/c Ratio	0.75	0.37	0.32	0.69	0.66	0.53	0.12	0.28	0.69	0.95
Control Delay	65.9	20.7	80.4	39.4	52.4	59.4	0.5	40.6	74.2	52.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.9	20.7	80.4	39.4	52.4	59.4	0.5	40.6	74.2	52.1
Queue Length 50th (ft)	204	231	33	479	155	193	0	56	203	207
Queue Length 95th (ft)	256	308	70	621	211	268	0	91	277	#365
Internal Link Dist (ft)		1155		834		912			742	
Turn Bay Length (ft)	550		490		250		225	200		
Base Capacity (vph)	637	2737	219	2243	308	441	500	379	403	583
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	0.58	0.37	0.15	0.69	0.63	0.48	0.11	0.20	0.51	0.83






























Intersection Summary

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

2016AM Existing_Sample Road.syn

HCM Signalized Intersection Capacity Analysis

5: NE 3rd Ave & Sample Road

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 		 			 	 	
Traffic Volume (vph)	345	830	105	30	1385	45	180	195	50	70	190	450
Future Volume (vph)	345	830	105	30	1385	45	180	195	50	70	190	450
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
Flt	1.00	0.98		1.00	1.00		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	4951		1752	5012		1752	1845	1568	1752	1845	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.29	1.00	1.00	0.58	1.00	1.00
Satd. Flow (perm)	3400	4951		1752	5012		535	1845	1568	1067	1845	1568
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	371	892	113	32	1489	48	194	210	54	75	204	484
RTOR Reduction (vph)	0	8	0	0	2	0	0	0	42	0	0	258
Lane Group Flow (vph)	371	997	0	32	1535	0	194	210	12	75	204	226
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)	21.3	84.8		6.1	69.6		49.1	34.4	34.4	34.5	25.8	25.8
Effective Green, g (s)	23.3	86.8		8.1	71.6		49.1	34.4	34.4	34.5	25.8	25.8
Actuated g/C Ratio	0.15	0.54		0.05	0.45		0.31	0.21	0.21	0.22	0.16	0.16
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)	495	2685		88	2242		295	396	337	267	297	252
v/s Ratio Prot	c0.11	0.20		0.02	c0.31		c0.07	0.11		0.02	0.11	
v/s Ratio Perm							0.13		0.01	0.05		c0.14
v/c Ratio	0.75	0.37		0.36	0.68		0.66	0.53	0.03	0.28	0.69	0.90
Uniform Delay, d1	65.6	21.0		73.5	35.2		44.3	55.6	49.7	51.4	63.3	65.8
Progression Factor	0.86	0.92		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.2	0.4		0.9	1.7		4.0	0.7	0.0	0.2	5.2	30.0
Delay (s)	61.9	19.7		74.4	36.9		48.3	56.3	49.7	51.6	68.5	95.8
Level of Service	E	B		E	D		D	E	D	D	E	F
Approach Delay (s)		31.0			37.7			52.2			84.1	
Approach LOS		C			D			D			F	
Intersection Summary												
HCM 2000 Control Delay			45.6				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			160.0				Sum of lost time (s)			22.0		
Intersection Capacity Utilization			79.8%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

2016AM Existing_Sample Road.syn

Queues

1: NW 5th Terr & Sample Road

	→	↙	←	↘	↗
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	2287	240	2057	104	109
v/c Ratio	0.50	0.81	0.49	0.68	0.46
Control Delay	18.0	86.7	1.2	91.4	16.9
Queue Delay	0.0	57.4	0.1	0.0	0.0
Total Delay	18.0	144.1	1.3	91.4	16.9
Queue Length 50th (ft)	314	198	34	108	0
Queue Length 95th (ft)	369	#369	26	171	60
Internal Link Dist (ft)	575		175	531	
Turn Bay Length (ft)					
Base Capacity (vph)	4602	298	4165	431	468
Starvation Cap Reductn	0	83	655	0	0
Spillback Cap Reductn	184	0	0	0	2
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.52	1.12	0.59	0.24	0.23

Intersection Summary

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

2016PM Existing_Sample Road.syn

HCM Signalized Intersection Capacity Analysis







1: NW 5th Terr & Sample Road

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑		↘	↑↑↑	↘	↗
Traffic Volume (vph)	2125	70	230	1975	100	105
Future Volume (vph)	2125	70	230	1975	100	105
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	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	7508		1770	5085	1770	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	7508		1770	5085	1770	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	2214	73	240	2057	104	109
RTOR Reduction (vph)	2	0	0	0	0	100
Lane Group Flow (vph)	2285	0	240	2057	104	9
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2 3		1	1 2 3	4	
Permitted Phases					4	4
Actuated Green, G (s)	96.1		25.0	129.1	13.9	13.9
Effective Green, g (s)	98.1		27.0	131.1	13.9	13.9
Actuated g/C Ratio	0.61		0.17	0.82	0.09	0.09
Clearance Time (s)			8.0		9.0	9.0
Vehicle Extension (s)			1.5		2.0	2.0
Lane Grp Cap (vph)	4603		298	4166	153	137
v/s Ratio Prot	c0.30		c0.14	c0.40	c0.06	
v/s Ratio Perm						0.01
v/c Ratio	0.50		0.81	0.49	0.68	0.07
Uniform Delay, d1	17.2		64.0	4.4	70.9	67.1
Progression Factor	1.00		1.07	0.17	1.00	1.00
Incremental Delay, d2	0.0		12.4	0.0	9.1	0.1
Delay (s)	17.2		80.8	0.8	80.0	67.2
Level of Service	B		F	A	E	E
Approach Delay (s)	17.2			9.1	73.4	
Approach LOS	B			A	E	
Intersection Summary						
HCM 2000 Control Delay			15.9		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.61			
Actuated Cycle Length (s)			160.0		Sum of lost time (s)	27.0
Intersection Capacity Utilization			61.4%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

2016PM Existing_Sample Road.syn

Queues

2: Sample Road & NW 5th Ave

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	167	2156	2151	240	172	146
v/c Ratio	0.80	0.41	0.51	0.21	0.58	0.54
Control Delay	76.0	1.6	11.3	2.9	77.3	16.7
Queue Delay	19.6	0.0	0.0	0.0	0.0	0.1
Total Delay	95.6	1.7	11.3	2.9	77.3	16.8
Queue Length 50th (ft)	173	21	258	25	90	0
Queue Length 95th (ft)	#296	34	264	m50	127	69
Internal Link Dist (ft)		175	1004		271	
Turn Bay Length (ft)				450		
Base Capacity (vph)	210	5248	4247	1130	836	496
Starvation Cap Reductn	36	837	0	0	0	0
Spillback Cap Reductn	0	0	189	0	0	46
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.49	0.53	0.21	0.21	0.32


















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.

2016PM Existing_Sample Road.syn

HCM Signalized Intersection Capacity Analysis

2: Sample Road & NW 5th Ave

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		  	  		 	
Traffic Volume (vph)	160	2070	2065	230	165	140
Future Volume (vph)	160	2070	2065	230	165	140
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	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	167	2156	2151	240	172	146
RTOR Reduction (vph)	0	0	0	81	0	133
Lane Group Flow (vph)	167	2156	2151	159	172	13
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)	17.0	129.1	104.1	104.1	13.9	13.9
Effective Green, g (s)	19.0	131.1	106.1	106.1	13.9	13.9
Actuated g/C Ratio	0.12	0.82	0.66	0.66	0.09	0.09
Clearance Time (s)	8.0				9.0	9.0
Vehicle Extension (s)	1.5				2.0	2.0
Lane Grp Cap (vph)	210	5250	4249	1049	298	137
v/s Ratio Prot	c0.09	0.34	c0.34		c0.05	
v/s Ratio Perm				0.10		0.01
v/c Ratio	0.80	0.41	0.51	0.15	0.58	0.09
Uniform Delay, d1	68.6	3.9	13.7	10.1	70.2	67.2
Progression Factor	0.76	0.35	0.78	2.02	1.00	1.00
Incremental Delay, d2	15.7	0.0	0.0	0.0	1.7	0.1
Delay (s)	67.7	1.4	10.6	20.4	71.9	67.4
Level of Service	E	A	B	C	E	E
Approach Delay (s)		6.1	11.6		69.8	
Approach LOS		A	B		E	
Intersection Summary						
HCM 2000 Control Delay			12.8		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.58			
Actuated Cycle Length (s)			160.0		Sum of lost time (s)	27.0
Intersection Capacity Utilization			61.3%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

2016PM Existing_Sample Road.syn

Queues

3: Sample Road & I-95 SB Ramp

	→	↘	←	↙	↗
Lane Group	EBT	EBR	WBT	SBL2	SBR
Lane Group Flow (vph)	1734	594	1781	422	609
v/c Ratio	0.46	0.38	0.59	0.46	0.81
Control Delay	19.2	1.3	15.7	26.0	37.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.2	1.3	15.7	26.0	37.1
Queue Length 50th (ft)	353	10	393	88	158
Queue Length 95th (ft)	404	34	m306	129	#228
Internal Link Dist (ft)	1004		259		
Turn Bay Length (ft)		250			
Base Capacity (vph)	3801	1583	3016	965	783
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	0.46	0.38	0.59	0.44	0.78

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.

2016PM Existing_Sample Road.syn

HCM Signalized Intersection Capacity Analysis

3: Sample Road & I-95 SB Ramp

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR	
Lane Configurations		↑↑↑	↗		↑↑↑		↘↘		↗↗			
Traffic Volume (vph)	0	1665	570	0	1710	0	405	0	585	0	0	
Future Volume (vph)	0	1665	570	0	1710	0	405	0	585	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			
Fr _t		1.00	0.85		1.00		1.00		0.85			
Fl _t Protected		1.00	1.00		1.00		0.95		1.00			
Satd. Flow (prot)		6408	1583		5085		3433		2787			
Fl _t Permitted		1.00	1.00		1.00		0.95		1.00			
Satd. Flow (perm)		6408	1583		5085		3433		2787			
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0	1734	594	0	1781	0	422	0	609	0	0	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	1734	594	0	1781	0	422	0	609	0	0	
Turn Type		NA	Free		NA		Prot		Prot			
Protected Phases		6			2		3		3			
Permitted Phases			Free									
Actuated Green, G (s)		45.5	80.0		45.5		19.5		19.5			
Effective Green, g (s)		47.5	80.0		47.5		21.5		21.5			
Actuated g/C Ratio		0.59	1.00		0.59		0.27		0.27			
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)		3804	1583		3019		922		749			
v/s Ratio Prot		0.27			c0.35		0.12		c0.22			
v/s Ratio Perm			0.38									
v/c Ratio		0.46	0.38		0.59		0.46		0.81			
Uniform Delay, d ₁		9.1	0.0		10.2		24.4		27.4			
Progression Factor		2.04	1.00		1.45		1.00		1.00			
Incremental Delay, d ₂		0.4	0.6		0.6		0.3		6.6			
Delay (s)		18.8	0.6		15.3		24.7		33.9			
Level of Service		B	A		B		C		C			
Approach Delay (s)		14.2			15.3			30.1		0.0		
Approach LOS		B			B			C		A		
Intersection Summary												
HCM 2000 Control Delay			17.8								HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			80.0								Sum of lost time (s)	11.0
Intersection Capacity Utilization			62.7%								ICU Level of Service	B
Analysis Period (min)			15									

c Critical Lane Group

Queues













	→	←	↖	↗	
Lane Group	EBT	WBT	WBR	NBL2	NBR
Lane Group Flow (vph)	1601	1585	356	1032	543
v/c Ratio	0.57	0.56	0.22	0.98	0.64
Control Delay	23.2	13.2	0.2	52.9	28.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	13.2	0.2	52.9	28.0
Queue Length 50th (ft)	449	417	0	261	131
Queue Length 95th (ft)	467	171	0	#392	189
Internal Link Dist (ft)	270	1155			
Turn Bay Length (ft)			250		
Base Capacity (vph)	2828	2828	1583	1051	853
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	0.57	0.56	0.22	0.98	0.64

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

4: I-95 NB Ramp & Sample Road











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	
Lane Configurations		↑↑↑			↑↑↑	↑	↑↑		↑↑			
Traffic Volume (vph)	0	1505	0	0	1490	335	970	0	510	0	0	
Future Volume (vph)	0	1505	0	0	1490	335	970	0	510	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	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Adj. Flow (vph)	0	1601	0	0	1585	356	1032	0	543	0	0	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	1601	0	0	1585	356	1032	0	543	0	0	
Turn Type		NA			NA	Free	Prot		Prot			
Protected Phases		6			2		4		4			
Permitted Phases						Free						
Actuated Green, G (s)		42.5			42.5	80.0	22.5		22.5			
Effective Green, g (s)		44.5			44.5	80.0	24.5		24.5			
Actuated g/C Ratio		0.56			0.56	1.00	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)		2828			2828	1583	1051		853			
v/s Ratio Prot		c0.31			0.31		c0.30		0.19			
v/s Ratio Perm						0.22						
v/c Ratio		0.57			0.56	0.22	0.98		0.64			
Uniform Delay, d1		11.5			11.4	0.0	27.5		23.9			
Progression Factor		1.94			1.09	1.00	1.00		1.00			
Incremental Delay, d2		0.2			0.6	0.2	23.3		1.4			
Delay (s)		22.6			13.1	0.2	50.8		25.3			
Level of Service		C			B	A	D		C			
Approach Delay (s)		22.6			10.7			42.0		0.0		
Approach LOS		C			B			D		A		
Intersection Summary												
HCM 2000 Control Delay			24.1								HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			80.0								Sum of lost time (s)	11.0
Intersection Capacity Utilization			56.1%								ICU Level of Service	B
Analysis Period (min)			15									

c Critical Lane Group

2016PM Existing_Sample Road.syn

Queues

5: NE 3rd Ave & Sample Road






























										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	432	1689	84	1469	200	311	84	47	242	347
v/c Ratio	0.79	0.66	0.56	0.67	0.73	0.70	0.17	0.24	0.82	0.69
Control Delay	69.2	40.8	84.2	39.7	58.3	64.9	0.7	40.7	85.7	17.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.2	40.8	84.2	39.7	58.3	64.9	0.7	40.7	85.7	17.6
Queue Length 50th (ft)	232	386	86	451	163	303	0	35	249	44
Queue Length 95th (ft)	291	629	143	582	219	396	0	63	331	150
Internal Link Dist (ft)		1155		834		912			742	
Turn Bay Length (ft)	550		490		250		225	200		
Base Capacity (vph)	643	2564	221	2191	287	448	505	327	407	579
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	0.67	0.66	0.38	0.67	0.70	0.69	0.17	0.14	0.59	0.60

Intersection Summary

2016PM Existing_Sample Road.syn

HCM Signalized Intersection Capacity Analysis

5: NE 3rd Ave & Sample Road

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  			  					 	 	
Traffic Volume (vph)	410	1445	160	80	1305	90	190	295	80	45	230	330
Future Volume (vph)	410	1445	160	80	1305	90	190	295	80	45	230	330
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
Flt	1.00	0.99		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	5009		1770	5036		1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.22	1.00	1.00	0.40	1.00	1.00
Satd. Flow (perm)	3433	5009		1770	5036		416	1863	1583	738	1863	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	432	1521	168	84	1374	95	200	311	84	47	242	347
RTOR Reduction (vph)	0	7	0	0	4	0	0	0	64	0	0	249
Lane Group Flow (vph)	432	1682	0	84	1465	0	200	311	20	47	242	98
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)	23.6	78.5		11.5	66.4		50.0	38.0	38.0	32.7	26.7	26.7
Effective Green, g (s)	25.6	80.5		13.5	68.4		50.0	38.0	38.0	32.7	26.7	26.7
Actuated g/C Ratio	0.16	0.50		0.08	0.43		0.31	0.24	0.24	0.20	0.17	0.17
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)	549	2520		149	2152		276	442	375	189	310	264
v/s Ratio Prot	c0.13	c0.34		0.05	0.29		c0.08	0.17		0.01	0.13	
v/s Ratio Perm							c0.15		0.01	0.04		0.06
v/c Ratio	0.79	0.67		0.56	0.68		0.72	0.70	0.05	0.25	0.78	0.37
Uniform Delay, d1	64.6	29.7		70.4	37.0		44.3	55.8	47.1	52.2	63.8	59.2
Progression Factor	0.94	1.30		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.6	1.2		2.9	1.8		7.8	4.1	0.0	0.3	11.1	0.3
Delay (s)	66.1	39.7		73.3	38.7		52.0	60.0	47.1	52.5	75.0	59.5
Level of Service	E	D		E	D		D	E	D	D	E	E
Approach Delay (s)		45.1			40.6			55.5			64.9	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			47.5				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			160.0				Sum of lost time (s)			22.0		
Intersection Capacity Utilization			79.9%				ICU Level of Service			D		
Analysis Period (min)			15									

c Critical Lane Group

2016PM Existing_Sample Road.syn