

HCM 2010 Signalized Intersection Capacity Analysis
 8: Dreher Ave/School Drive & Main Street

3/27/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	399	163	235	559	107	36	28	194	116	43	60
Movement Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Queue, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj. Factor (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking, Bus Adj. Factors	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Sat. Flow Rate, veh/h/ln	1456	1674	1674	1660	1613	1602	1561	1706	1706	1609	1609	1609
Lanes	1	1	0	1	1	1	1	1	0	1	1	0
Lane Assignment												
Capacity, veh/h	372	804	307	0	1123	930	240	39	321	97	140	196
Proportion Arriving On Green	0.70	0.70	0.70	0.01	0.70	0.68	0.24	0.24	0.24	0.23	0.23	0.23
Movement Delay, s/veh	20.7	0.0	13.8	0.0	13.0	8.5	53.0	0.0	63.9	267.2	0.0	48.7
Movement LOS	C		B		B	A	D		E	F		D
Approach Volume, veh/h		703			724			327			238	
Approach Delay, s/veh		14.4			12.3			62.5			164.4	
Approach LOS		B			B			E			F	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phase			2		4		6		8			
Case No			6.3		6.0		3.0		6.0			
Phase Duration (G+Y+Rc), s			109.40		40.60		109.40		40.60			
Change Period (Y+Rc), s			7.00		6.00		7.00		6.00			
Max. Allowable Headway (MAH), s			3.61		4.66		3.61		4.66			
Maximum Green Setting (Gmax), s			79.60		34.60		102.40		34.60			
Max. Queue Clearance Time (g_c+I1), s			37.49		36.60		29.55		28.88			
Green Extension Time (g_e), s			4.94		0.00		4.97		1.37			
Probability of Phase Call (p_c)			1.000		1.000		1.000		1.000			
Probability of Max Out (p_x)			0.002		1.000		0.000		0.739			
Left-Turn Movement Data												
Assigned Movement			5		7				3			
Mvmt. Sat Flow, veh/h			633.06		943.32				1069.05			
Through Movement Data												
Assigned Movement			2		4		6		8			
Mvmt. Sat Flow, veh/h			1155.13		608.97		1613.21		158.82			
Right-Turn Movement Data												
Assigned Movement			12		14		16		18			
Mvmt. Sat Flow, veh/h			441.12		849.72		1361.84		1314.79			
Left Lane Group Data												
Assigned Movement		0	5	0	7	0	0	0	3			
Lane Assignment			L		L				L			
Lanes in Group		0	1	0	1	0	0	0	1			
Group Volume (v), veh/h		0.0	62.0	0.0	126.1	0.0	0.0	0.0	44.4			
Group Sat. Flow (s), veh/h/ln		0.0	633.1	0.0	943.3	0.0	0.0	0.0	1069.0			
Queue Serve Time (g_s), s		0.0	7.9	0.0	7.7	0.0	0.0	0.0	5.3			
Cycle Queue Clear Time (g_c), s		0.0	35.5	0.0	34.6	0.0	0.0	0.0	14.9			

HCM 2010 Signalized Intersection Capacity Analysis

8: Dreher Ave/School Drive & Main Street

3/27/2015

Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	633.1	0.0	943.3	0.0	0.0	0.0	1069.0
Shared LT Sat Flow (s_sh), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Eff. Green (g_p), s	0.0	104.4	0.0	34.6	0.0	0.0	0.0	36.6
Perm LT Serve Time (g_u), s	0.0	76.8	0.0	7.7	0.0	0.0	0.0	27.0
Perm LT Que Serve Time (g_ps), s	0.0	7.9	0.0	7.7	0.0	0.0	0.0	5.3
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Proportion LT Inside Lane (P_L)	0.000	1.000	0.000	1.000	0.000	0.000	0.000	1.000
Lane Group Capacity (c), veh/h	0.0	372.3	0.0	96.5	0.0	0.0	0.0	240.5
Volume-to-Capacity Ratio (X)	0.000	0.166	0.000	1.306	0.000	0.000	0.000	0.185
Available Capacity (c_a), veh/h	0.0	372.3	0.0	96.5	0.0	0.0	0.0	240.5
Upstream Filter Factor (I)	0.000	1.000	0.000	1.000	0.000	0.000	0.000	1.000
Uniform Delay (d1), s/veh	0.0	19.8	0.0	73.1	0.0	0.0	0.0	52.6
Incremental Delay (d2), s/veh	0.0	1.0	0.0	194.2	0.0	0.0	0.0	0.4
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	20.7	0.0	267.2	0.0	0.0	0.0	53.0
First-Term Queue (Q1), veh/ln	0.0	1.2	0.0	3.8	0.0	0.0	0.0	1.4
Second-Term Queue (Q2), veh/ln	0.0	0.1	0.0	5.2	0.0	0.0	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	0.000	1.000	0.000	0.000	0.000	1.000
Percentile Back of Queue (Q%), veh/ln	0.0	1.3	0.0	9.0	0.0	0.0	0.0	1.5
Percentile Storage Ratio (RQ%)	0.00	0.25	0.00	2.31	0.00	0.00	0.00	0.46
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	7.4	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Movement	0	2	0	4	0	6	0	8
Lane Assignment	T							
Lanes in Group	0	0	0	0	0	1	0	0
Group Volume (v), veh/h	0.0	0.0	0.0	0.0	0.0	607.6	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	0.0	0.0	0.0	0.0	1613.2	0.0	0.0
Queue Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	27.6	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	27.6	0.0	0.0
Lane Group Capacity (c), veh/h	0.0	0.0	0.0	0.0	0.0	1122.8	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	0.000	0.000	0.000	0.541	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	0.0	0.0	0.0	1122.8	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	11.1	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	13.0	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	9.3	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	0.000	1.000	0.000	1.000	0.000	1.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	0.0	0.0	0.0	9.9	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00

HCM 2010 Signalized Intersection Capacity Analysis
 8: Dreher Ave/School Drive & Main Street

3/27/2015

Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Movement	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		R		T+R
Lanes in Group	0	1	0	1	0	1	0	1
Group Volume (v), veh/h	0.0	641.1	0.0	112.0	0.0	116.3	0.0	282.4
Group Sat. Flow (s), veh/h/ln	0.0	1596.3	0.0	1458.7	0.0	1361.8	0.0	1473.6
Queue Serve Time (g_s), s	0.0	30.6	0.0	9.6	0.0	4.4	0.0	26.9
Cycle Queue Clear Time (g_c), s	0.0	30.6	0.0	9.6	0.0	4.4	0.0	26.9
Prot RT Sat Flow Rate (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff. Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Proportion RT Outside Lane (P_R)	0.000	0.276	0.000	0.583	0.000	1.000	0.000	0.892
Lane Group Capacity (c), veh/h	0.0	1111.0	0.0	336.5	0.0	929.7	0.0	359.6
Volume-to-Capacity Ratio (X)	0.000	0.577	0.000	0.333	0.000	0.125	0.000	0.785
Available Capacity (c_a), veh/h	0.0	1111.0	0.0	336.5	0.0	929.7	0.0	359.6
Upstream Filter Factor (I)	0.000	1.000	0.000	1.000	0.000	1.000	0.000	1.000
Uniform Delay (d1), s/veh	0.0	11.6	0.0	48.1	0.0	8.3	0.0	53.0
Incremental Delay (d2), s/veh	0.0	2.2	0.0	0.6	0.0	0.3	0.0	10.9
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	13.8	0.0	48.7	0.0	8.5	0.0	63.9
First-Term Queue (Q1), veh/ln	0.0	10.2	0.0	3.6	0.0	1.3	0.0	9.9
Second-Term Queue (Q2), veh/ln	0.0	0.7	0.0	0.1	0.0	0.1	0.0	1.1
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	0.000	1.000	0.000	1.000	0.000	1.000
Percentile Back of Queue (Q%), veh/ln	0.0	10.9	0.0	3.6	0.0	1.4	0.0	11.0
Percentile Storage Ratio (RQ%)	0.00	0.56	0.00	0.63	0.00	0.18	0.00	0.51
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM Average Control Delay	39.4
HCM Level of Service	D

HCM 2010 Signalized Intersection Capacity Analysis
 9: 9th St & Main Street

3/27/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	177	419	7	2	384	161	43	74	63	301	8	35
Movement Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Queue, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj. Factor (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking, Bus Adj. Factors	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Sat. Flow Rate, veh/h/ln	1593	1593	1593	1652	1652	1636	1638	1638	1638	1710	1703	1703
Lanes	0	2	0	0	1	1	0	1	0	1	1	0
Lane Assignment												
Capacity, veh/h	0	1568	64	26	888	679	120	238	168	311	66	528
Proportion Arriving On Green	0.00	0.54	0.54	0.45	0.45	0.46	0.40	0.40	0.40	0.40	0.40	0.40
Movement Delay, s/veh	0.0	19.9	20.0	29.5	0.0	23.8	33.5	0.0	0.0	127.9	0.0	28.1
Movement LOS		B	B	C		C	C			F		C
Approach Volume, veh/h		513			687			259			402	
Approach Delay, s/veh		19.9			27.8			33.5			110.1	
Approach LOS		B			C			C			F	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phase			2		4		6		8			
Case No			4.0		6.0		7.3		8.0			
Phase Duration (G+Y+Rc), s			85.40		64.60		85.40		64.60			
Change Period (Y+Rc), s			4.50		6.00		4.50		6.00			
Max. Allowable Headway (MAH), s			3.83		4.69		3.83		4.69			
Maximum Green Setting (Gmax), s			80.90		58.60		80.90		58.60			
Max. Queue Clearance Time (g_c+I1), s			16.14		62.60		33.42		24.13			
Green Extension Time (g_e), s			4.27		0.00		4.27		3.45			
Probability of Phase Call (p_c)			1.000		1.000		1.000		1.000			
Probability of Max Out (p_x)			0.000		1.000		0.000		0.001			
Left-Turn Movement Data												
Assigned Movement					7		1		3			
Mvmt. Sat Flow, veh/h					1024.44		13.73		265.32			
Through Movement Data												
Assigned Movement			2		4		6		8			
Mvmt. Sat Flow, veh/h			2889.21		164.36		1627.01		549.35			
Right-Turn Movement Data												
Assigned Movement			12		14		16		18			
Mvmt. Sat Flow, veh/h			117.02		1307.42		1251.55		415.72			
Left Lane Group Data												
Assigned Movement		0	0	0	7	0	1	0	3			
Lane Assignment					L		L+T		L+T+R			
Lanes in Group		0	0	0	1	0	1	0	1			
Group Volume (v), veh/h		0.0	0.0	0.0	330.8	0.0	478.1	0.0	259.0			
Group Sat. Flow (s), veh/h/ln		0.0	0.0	0.0	1024.4	0.0	1640.7	0.0	1230.4			
Queue Serve Time (g_s), s		0.0	0.0	0.0	38.5	0.0	0.0	0.0	14.9			
Cycle Queue Clear Time (g_c), s		0.0	0.0	0.0	60.6	0.0	31.4	0.0	22.1			

HCM 2010 Signalized Intersection Capacity Analysis
 9: 9th St & Main Street

3/27/2015

Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	0.0	0.0	1024.4	0.0	457.7	0.0	764.7
Shared LT Sat Flow (s_sh), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Eff. Green (g_p), s	0.0	0.0	0.0	60.6	0.0	81.4	0.0	60.6
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	38.5	0.0	67.3	0.0	56.0
Perm LT Que Serve Time (g_ps), s	0.0	0.0	0.0	38.5	0.0	0.0	0.0	14.9
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	59.2	0.0	7.3
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	31.4	0.0	7.3
Proportion LT Inside Lane (P_L)	0.000	0.000	0.000	1.000	0.000	0.008	0.000	0.216
Lane Group Capacity (c), veh/h	0.0	0.0	0.0	310.7	0.0	914.6	0.0	526.3
Volume-to-Capacity Ratio (X)	0.000	0.000	0.000	1.064	0.000	0.523	0.000	0.492
Available Capacity (c_a), veh/h	0.0	0.0	0.0	310.7	0.0	914.6	0.0	526.3
Upstream Filter Factor (I)	0.000	0.000	0.000	1.000	0.000	0.944	0.000	1.000
Uniform Delay (d1), s/veh	0.0	0.0	0.0	58.7	0.0	27.5	0.0	32.7
Incremental Delay (d2), s/veh	0.0	0.0	0.0	69.1	0.0	2.0	0.0	0.7
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	127.9	0.0	29.5	0.0	33.5
First-Term Queue (Q1), veh/ln	0.0	0.0	0.0	12.0	0.0	13.0	0.0	7.1
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	6.0	0.0	0.5	0.0	0.1
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	0.000	0.000	1.000	0.000	1.000	0.000	1.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	0.0	17.9	0.0	13.5	0.0	7.2
Percentile Storage Ratio (RQ%)	0.00	0.00	0.00	3.35	0.00	0.71	0.00	0.46
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Movement	0	2	0	4	0	6	0	8
Lane Assignment	T							
Lanes in Group	0	1	0	0	0	0	0	0
Group Volume (v), veh/h	0.0	271.4	0.0	0.0	0.0	0.0	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1593.1	0.0	0.0	0.0	0.0	0.0	0.0
Queue Serve Time (g_s), s	0.0	14.1	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	14.1	0.0	0.0	0.0	0.0	0.0	0.0
Lane Group Capacity (c), veh/h	0.0	864.5	0.0	0.0	0.0	0.0	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.314	0.000	0.000	0.000	0.000	0.000	0.000
Available Capacity (c_a), veh/h	0.0	864.5	0.0	0.0	0.0	0.0	0.0	0.0
Upstream Filter Factor (I)	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	18.9	0.0	0.0	0.0	0.0	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	19.9	0.0	0.0	0.0	0.0	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	5.4	0.0	0.0	0.0	0.0	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	0.000	1.000	0.000	1.000	0.000	1.000
Percentile Back of Queue (Q%), veh/ln	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00

HCM 2010 Signalized Intersection Capacity Analysis

9: 9th St & Main Street

3/27/2015

Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Movement	0	12	0	14	0	16	0	18
Lane Assignment	T+R		T+R		R			
Lanes in Group	0	1	0	1	0	1	0	0
Group Volume (v), veh/h	0.0	241.5	0.0	71.6	0.0	209.1	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1413.1	0.0	1471.8	0.0	1251.5	0.0	0.0
Queue Serve Time (g_s), s	0.0	14.1	0.0	4.6	0.0	15.7	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	14.1	0.0	4.6	0.0	15.7	0.0	0.0
Prot RT Sat Flow Rate (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff. Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Proportion RT Outside Lane (P_R)	0.000	0.083	0.000	0.888	0.000	1.000	0.000	0.338
Lane Group Capacity (c), veh/h	0.0	766.9	0.0	594.6	0.0	679.2	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.315	0.000	0.120	0.000	0.308	0.000	0.000
Available Capacity (c_a), veh/h	0.0	766.9	0.0	594.6	0.0	679.2	0.0	0.0
Upstream Filter Factor (I)	0.000	1.000	0.000	1.000	0.000	0.944	0.000	0.000
Uniform Delay (d1), s/veh	0.0	18.9	0.0	28.0	0.0	22.7	0.0	0.0
Incremental Delay (d2), s/veh	0.0	1.1	0.0	0.1	0.0	1.1	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	20.0	0.0	28.1	0.0	23.8	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	4.8	0.0	1.6	0.0	4.9	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	0.000	1.000	0.000	1.000	0.000	1.000
Percentile Back of Queue (Q%), veh/ln	0.0	5.0	0.0	1.7	0.0	5.1	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.44	0.00	0.03	0.00	0.27	0.00	0.00
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Intersection Summary								
HCM Average Control Delay	44.2							
HCM Level of Service	D							

HCM 2010 Signalized Intersection Capacity Analysis
 10: 8th St & Main Street/Main Street

3/27/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	575	22	6	330	8	65	76	35	43	19	68
Movement Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Queue, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj. Factor (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking, Bus Adj. Factors	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00
Adj. Sat. Flow Rate, veh/h/ln	1667	1667	1667	1762	1762	1762	1673	1673	1673	1690	1690	1690
Lanes	0	2	0	0	1	0	0	1	0	0	1	0
Lane Assignment												
Capacity, veh/h	170	1586	80	61	1091	33	140	154	72	135	77	156
Proportion Arriving On Green	0.56	0.56	0.56	0.47	0.47	0.47	0.25	0.25	0.25	0.25	0.25	0.25
Movement Delay, s/veh	7.6	0.0	7.9	9.7	0.0	0.0	27.4	0.0	0.0	24.6	0.0	0.0
Movement LOS	A		A	A			C			C		
Approach Volume, veh/h		710			408			221			172	
Approach Delay, s/veh		7.7			9.7			27.4			24.6	
Approach LOS		A			A			C			C	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phase			2		4		6		8			
Case No			8.0		8.0		8.0		8.0			
Phase Duration (G+Y+Rc), s			52.50		22.50		52.50		22.50			
Change Period (Y+Rc), s			4.50		5.50		4.50		5.50			
Max. Allowable Headway (MAH), s			3.57		4.47		3.57		4.47			
Maximum Green Setting (Gmax), s			48.00		17.00		48.00		17.00			
Max. Queue Clearance Time (g_c+I1), s			11.76		10.01		12.99		12.97			
Green Extension Time (g_e), s			3.28		0.96		3.28		0.65			
Probability of Phase Call (p_c)			1.000		1.000		1.000		1.000			
Probability of Max Out (p_x)			0.001		0.354		0.001		1.000			
Left-Turn Movement Data												
Assigned Movement			5		7		1		3			
Mvmt. Sat Flow, veh/h			225.07		388.68		50.14		390.75			
Through Movement Data												
Assigned Movement			2		4		6		8			
Mvmt. Sat Flow, veh/h			2324.40		194.47		1603.18		520.50			
Right-Turn Movement Data												
Assigned Movement			12		14		16		18			
Mvmt. Sat Flow, veh/h			120.60		614.65		49.89		282.63			
Left Lane Group Data												
Assigned Movement		0	5	0	7	0	1	0	3			
Lane Assignment			L+T		L+T+R		L+T+R		L+T+R			
Lanes in Group		0	1	0	1	0	1	0	1			
Group Volume (v), veh/h		0.0	355.0	0.0	172.1	0.0	407.7	0.0	220.7			
Group Sat. Flow (s), veh/h/ln		0.0	1325.8	0.0	1197.8	0.0	1703.2	0.0	1193.9			
Queue Serve Time (g_s), s		0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0			
Cycle Queue Clear Time (g_c), s		0.0	8.5	0.0	8.0	0.0	11.0	0.0	11.0			

HCM 2010 Signalized Intersection Capacity Analysis
 10: 8th St & Main Street/Main Street

3/27/2015

Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	613.4	0.0	694.7	0.0	496.7	0.0	717.0
Shared LT Sat Flow (s_sh), veh/h/ln	0.0	1667.4	0.0	1194.7	0.0	0.0	0.0	1330.3
Perm LT Eff. Green (g_p), s	0.0	50.0	0.0	19.0	0.0	50.0	0.0	19.0
Perm LT Serve Time (g_u), s	0.0	39.0	0.0	8.0	0.0	40.2	0.0	11.0
Perm LT Que Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
Time to First Blk (g_f), s	0.0	9.7	0.0	4.1	0.0	31.5	0.0	3.6
Serve Time pre Blk (g_fs), s	0.0	8.5	0.0	4.1	0.0	11.0	0.0	3.6
Proportion LT Inside Lane (P_L)	0.000	0.170	0.000	0.324	0.000	0.029	0.000	0.327
Lane Group Capacity (c), veh/h	0.0	940.1	0.0	367.0	0.0	1185.0	0.0	366.1
Volume-to-Capacity Ratio (X)	0.000	0.378	0.000	0.469	0.000	0.344	0.000	0.603
Available Capacity (c_a), veh/h	0.0	940.1	0.0	367.0	0.0	1185.0	0.0	366.2
Upstream Filter Factor (I)	0.000	0.228	0.000	1.000	0.000	0.335	0.000	1.000
Uniform Delay (d1), s/veh	0.0	7.3	0.0	23.7	0.0	9.5	0.0	24.6
Incremental Delay (d2), s/veh	0.0	0.3	0.0	0.9	0.0	0.3	0.0	2.8
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	7.6	0.0	24.6	0.0	9.7	0.0	27.4
First-Term Queue (Q1), veh/ln	0.0	2.8	0.0	2.6	0.0	4.4	0.0	3.7
Second-Term Queue (Q2), veh/ln	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.3
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	0.000	1.000	0.000	1.000	0.000	1.000
Percentile Back of Queue (Q%), veh/ln	0.0	2.8	0.0	2.7	0.0	4.4	0.0	3.9
Percentile Storage Ratio (RQ%)	0.00	0.15	0.00	0.25	0.00	0.22	0.00	0.33
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Movement	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Group	0	0	0	0	0	0	0	0
Group Volume (v), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Group Capacity (c), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	0.000	1.000	0.000	1.000	0.000	1.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

HCM 2010 Signalized Intersection Capacity Analysis
 10: 8th St & Main Street/Main Street

3/27/2015

Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Movement	0	12	0	14	0	16	0	18
Lane Assignment	T+R							
Lanes in Group	0	1	0	0	0	0	0	0
Group Volume (v), veh/h	0.0	355.4	0.0	0.0	0.0	0.0	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1344.3	0.0	0.0	0.0	0.0	0.0	0.0
Queue Serve Time (g_s), s	0.0	9.8	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	9.8	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Sat Flow Rate (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff. Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Proportion RT Outside Lane (P_R)	0.000	0.090	0.000	0.513	0.000	0.029	0.000	0.237
Lane Group Capacity (c), veh/h	0.0	896.2	0.0	0.0	0.0	0.0	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.397	0.000	0.000	0.000	0.000	0.000	0.000
Available Capacity (c_a), veh/h	0.0	896.2	0.0	0.0	0.0	0.0	0.0	0.0
Upstream Filter Factor (I)	0.000	0.228	0.000	0.000	0.000	0.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	7.6	0.0	0.0	0.0	0.0	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	7.9	0.0	0.0	0.0	0.0	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	0.000	1.000	0.000	1.000	0.000	1.000
Percentile Back of Queue (Q%), veh/ln	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM Average Control Delay	13.1
HCM Level of Service	B

HCM 2010 Signalized Intersection Capacity Analysis
 11: Seventh St/7th St & Main Street /Main Street

3/27/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	447	259	42	250	22	106	135	113	31	232	28
Movement Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Queue, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj. Factor (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking, Bus Adj. Factors	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	0.90
Adj. Sat. Flow Rate, veh/h/ln	1681	1681	1681	1747	1747	1747	1682	1682	1682	1707	1707	1707
Lanes	0	2	0	0	1	0	0	1	0	0	1	0
Lane Assignment												
Capacity, veh/h	48	788	436	59	333	44	171	154	114	119	428	75
Proportion Arriving On Green	0.38	0.38	0.38	0.43	0.43	0.43	0.34	0.34	0.34	0.48	0.48	0.48
Movement Delay, s/veh	41.1	0.0	43.8	91.3	0.0	0.0	140.3	0.0	0.0	29.1	0.0	0.0
Movement LOS	D		D	F			F			C		
Approach Volume, veh/h		914			442			510			383	
Approach Delay, s/veh		42.4			91.3			140.3			29.1	
Approach LOS		D			F			F			C	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phase			2		4		6		8			
Case No			8.0		8.0		8.0		8.0			
Phase Duration (G+Y+Rc), s			75.20		74.80		75.20		74.80			
Change Period (Y+Rc), s			5.00		5.00		5.00		5.00			
Max. Allowable Headway (MAH), s			3.74		4.62		3.74		4.62			
Maximum Green Setting (Gmax), s			70.20		69.80		70.20		69.80			
Max. Queue Clearance Time (g_c+l1), s			42.51		30.61		74.20		73.80			
Green Extension Time (g_e), s			4.71		5.06		0.00		0.00			
Probability of Phase Call (p_c)			1.000		1.000		1.000		1.000			
Probability of Max Out (p_x)			0.022		0.003		1.000		1.000			
Left-Turn Movement Data												
Assigned Movement			5		7		1		3			
Mvmt. Sat Flow, veh/h			79.50		209.31		108.01		299.27			
Through Movement Data												
Assigned Movement			2		4		6		8			
Mvmt. Sat Flow, veh/h			1603.88		874.31		651.60		312.33			
Right-Turn Movement Data												
Assigned Movement			12		14		16		18			
Mvmt. Sat Flow, veh/h			906.50		156.46		92.24		238.26			
Left Lane Group Data												
Assigned Movement		0	5	0	7	0	1	0	3			
Lane Assignment			L+T		L+T+R		L+T+R		L+T+R			
Lanes in Group		0	1	0	1	0	1	0	1			
Group Volume (v), veh/h		0.0	484.3	0.0	382.6	0.0	441.7	0.0	510.2			
Group Sat. Flow (s), veh/h/ln		0.0	1372.8	0.0	1240.1	0.0	851.9	0.0	849.9			
Queue Serve Time (g_s), s		0.0	0.0	0.0	0.0	0.0	31.7	0.0	43.2			
Cycle Queue Clear Time (g_c), s		0.0	40.5	0.0	28.6	0.0	72.2	0.0	71.8			

HCM 2010 Signalized Intersection Capacity Analysis

11: Seventh St/7th St & Main Street /Main Street

3/27/2015

Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	599.4	0.0	571.8	0.0	428.3	0.0	623.9
Shared LT Sat Flow (s_sh), veh/h/ln	0.0	1217.3	0.0	1302.2	0.0	0.0	0.0	655.1
Perm LT Eff. Green (g_p), s	0.0	72.2	0.0	71.8	0.0	72.2	0.0	71.8
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	31.7	0.0	43.2
Perm LT Que Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	31.7	0.0	43.2
Time to First Blk (g_f), s	0.0	24.2	0.0	9.8	0.0	13.7	0.0	1.3
Serve Time pre Blk (g_fs), s	0.0	24.2	0.0	9.8	0.0	13.7	0.0	1.3
Proportion LT Inside Lane (P_L)	0.000	0.058	0.000	0.169	0.000	0.127	0.000	0.352
Lane Group Capacity (c), veh/h	0.0	686.1	0.0	621.6	0.0	437.1	0.0	439.3
Volume-to-Capacity Ratio (X)	0.000	0.706	0.000	0.616	0.000	1.011	0.000	1.162
Available Capacity (c_a), veh/h	0.0	686.1	0.0	621.6	0.0	437.1	0.0	439.3
Upstream Filter Factor (I)	0.000	0.944	0.000	1.000	0.000	0.960	0.000	0.552
Uniform Delay (d1), s/veh	0.0	35.4	0.0	27.3	0.0	46.5	0.0	54.0
Incremental Delay (d2), s/veh	0.0	5.7	0.0	1.8	0.0	44.8	0.0	86.4
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	41.1	0.0	29.1	0.0	91.3	0.0	140.3
First-Term Queue (Q1), veh/ln	0.0	15.3	0.0	9.9	0.0	17.2	0.0	16.9
Second-Term Queue (Q2), veh/ln	0.0	1.1	0.0	0.3	0.0	5.4	0.0	10.5
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	0.000	1.000	0.000	1.000	0.000	1.000
Percentile Back of Queue (Q%), veh/ln	0.0	16.4	0.0	10.2	0.0	22.6	0.0	27.5
Percentile Storage Ratio (RQ%)	0.00	0.84	0.00	0.85	0.00	2.31	0.00	1.82
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	1.1	0.0	17.7
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3
Middle Lane Group Data								
Assigned Movement	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Group	0	0	0	0	0	0	0	0
Group Volume (v), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Group Capacity (c), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	0.000	1.000	0.000	1.000	0.000	1.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

HCM 2010 Signalized Intersection Capacity Analysis
 11: Seventh St/7th St & Main Street /Main Street

3/27/2015

Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Movement	0	12	0	14	0	16	0	18
Lane Assignment	T+R							
Lanes in Group	0	1	0	0	0	0	0	0
Group Volume (v), veh/h	0.0	429.3	0.0	0.0	0.0	0.0	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1217.1	0.0	0.0	0.0	0.0	0.0	0.0
Queue Serve Time (g_s), s	0.0	39.4	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	39.4	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Sat Flow Rate (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff. Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Proportion RT Outside Lane (P_R)	0.000	0.745	0.000	0.126	0.000	0.108	0.000	0.280
Lane Group Capacity (c), veh/h	0.0	585.8	0.0	0.0	0.0	0.0	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.733	0.000	0.000	0.000	0.000	0.000	0.000
Available Capacity (c_a), veh/h	0.0	585.8	0.0	0.0	0.0	0.0	0.0	0.0
Upstream Filter Factor (I)	0.000	0.944	0.000	0.000	0.000	0.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	36.3	0.0	0.0	0.0	0.0	0.0	0.0
Incremental Delay (d2), s/veh	0.0	7.5	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	43.8	0.0	0.0	0.0	0.0	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	13.6	0.0	0.0	0.0	0.0	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Third-Term Queue (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentile bk-of-que factor (f_B%)	0.000	1.000	0.000	1.000	0.000	1.000	0.000	1.000
Percentile Back of Queue (Q%), veh/ln	0.0	14.8	0.0	0.0	0.0	0.0	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00
Initial Queue (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Queue (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Queue (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturated Capacity (cs), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Queue Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM Average Control Delay	72.0
HCM Level of Service	E

HCM Signalized Intersection Capacity Analysis

12: Seventh St & Ann St

3/27/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↔			↔			↔		
Volume (vph)	0	0	0	44	209	33	148	339	0	0	633	64	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	12	12	16	16	16	16	16	16	10	10	10	
Grade (%)		0%			2%			-5%			0%		
Total Lost time (s)					4.0			4.5			4.5		
Lane Util. Factor					1.00			1.00			1.00		
Frt					0.98			1.00			0.98		
Flt Protected					0.99			0.99			1.00		
Satd. Flow (prot)					1846			2138			1558		
Flt Permitted					0.99			0.49			1.00		
Satd. Flow (perm)					1846			1060			1558		
Peak-hour factor, PHF	0.92	0.92	0.92	0.52	0.82	0.69	0.82	0.80	0.92	0.92	0.91	0.73	
Adj. Flow (vph)	0	0	0	85	255	48	180	424	0	0	696	88	
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	2	0	
Lane Group Flow (vph)	0	0	0	0	385	0	0	604	0	0	782	0	
Heavy Vehicles (%)	0%	0%	0%	2%	1%	0%	1%	2%	0%	0%	1%	0%	
Parking (#/hr)				0	0	0					0	0	
Turn Type				Perm	NA		pm+pt	NA			NA		
Protected Phases					6		3	8			4		
Permitted Phases				6			8						
Actuated Green, G (s)					29.0			110.5			110.5		
Effective Green, g (s)					30.0			111.5			111.5		
Actuated g/C Ratio					0.20			0.74			0.74		
Clearance Time (s)					5.0			5.5			5.5		
Vehicle Extension (s)					3.0			3.0			3.0		
Lane Grp Cap (vph)					369			788			1158		
v/s Ratio Prot											0.50		
v/s Ratio Perm					0.21			c0.57					
v/c Ratio					1.04			0.77			0.68		
Uniform Delay, d1					60.0			11.5			9.9		
Progression Factor					1.00			1.00			1.28		
Incremental Delay, d2					58.4			4.5			1.3		
Delay (s)					118.4			16.0			13.9		
Level of Service					F			B			B		
Approach Delay (s)		0.0			118.4			16.0			13.9		
Approach LOS		A			F			B			B		
Intersection Summary													
HCM Average Control Delay			37.5		HCM Level of Service						D		
HCM Volume to Capacity ratio			0.83										
Actuated Cycle Length (s)			150.0		Sum of lost time (s)					8.5			
Intersection Capacity Utilization			89.5%		ICU Level of Service					E			
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

13: 6th St & Main Street

3/27/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕			↕				
Volume (vph)	27	584	19	15	245	34	44	65	61	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	16	16	16	11	11	11	12	12	12
Grade (%)		-1%			2%			-1%			0%	
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		0.95			1.00			1.00				
Frt		0.99			0.98			0.95				
Flt Protected		1.00			1.00			0.99				
Satd. Flow (prot)		2946			1677			1554				
Flt Permitted		0.90			0.93			0.99				
Satd. Flow (perm)		2664			1565			1554				
Peak-hour factor, PHF	0.61	0.90	0.68	0.63	0.83	0.71	0.79	0.68	0.80	0.92	0.92	0.92
Adj. Flow (vph)	44	649	28	24	295	48	56	96	76	0	0	0
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	720	0	0	365	0	0	228	0	0	0	0
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%
Parking (#/hr)		0	0	0	0	0						
Turn Type	Perm	NA		Perm	NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2			6			4					
Actuated Green, G (s)		112.2			112.2			27.8				
Effective Green, g (s)		113.2			113.2			28.8				
Actuated g/C Ratio		0.75			0.75			0.19				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		2010			1181			298				
v/s Ratio Prot												
v/s Ratio Perm		0.27			0.23			0.15				
v/c Ratio		0.36			0.31			0.77				
Uniform Delay, d1		6.2			5.9			57.4				
Progression Factor		0.49			0.90			1.00				
Incremental Delay, d2		0.3			0.7			11.1				
Delay (s)		3.3			5.9			68.5				
Level of Service		A			A			E				
Approach Delay (s)		3.3			5.9			68.5			0.0	
Approach LOS		A			A			E			A	
Intersection Summary												
HCM Average Control Delay			15.3									B
HCM Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			150.0								8.0	
Intersection Capacity Utilization			47.8%									A
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

14: Ann St & Broad St/5th St & Main Street

3/27/2015



Movement	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2
Lane Configurations	↑↑		↵	↵	↵	↑	↵
Volume (vph)	570	74	290	655	78	570	348
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	10	11	10	10	11
Grade (%)	-5%					2%	
Total Lost time (s)	4.5		6.5	4.0	4.0	4.0	6.5
Lane Util. Factor	0.95		1.00	1.00	1.00	1.00	1.00
Frt	0.98		1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3372		1509	1398	1752	1793	1377
Flt Permitted	1.00		0.23	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3372		361	1398	1752	1792	1377
Peak-hour factor, PHF	0.92	0.91	0.91	0.96	0.81	0.95	0.91
Adj. Flow (vph)	620	81	319	682	96	600	382
RTOR Reduction (vph)	0	0	0	0	0	0	89
Lane Group Flow (vph)	701	0	319	682	96	600	293
Heavy Vehicles (%)	0%	0%	1%	1%	3%	2%	1%
Turn Type	NA		custom	custom	pm+pt	NA	custom
Protected Phases	8		1	6	5	2	
Permitted Phases			6		2		2 8
Actuated Green, G (s)	34.0		102.5	90.7	79.9	74.6	115.1
Effective Green, g (s)	36.5		102.5	93.2	84.9	77.1	115.1
Actuated g/C Ratio	0.24		0.68	0.62	0.57	0.51	0.77
Clearance Time (s)	7.0		6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	821		410	869	992	922	1057
v/s Ratio Prot	c0.21		c0.11	c0.49	0.01	0.33	
v/s Ratio Perm			0.42		0.05		0.21
v/c Ratio	0.85		0.78	0.78	0.10	0.65	0.28
Uniform Delay, d1	54.2		18.9	21.0	14.9	26.6	5.2
Progression Factor	0.98		1.00	1.00	0.94	1.00	1.55
Incremental Delay, d2	8.2		9.0	4.7	0.0	3.0	0.1
Delay (s)	61.1		27.9	25.7	14.1	29.6	8.1
Level of Service	E		C	C	B	C	A
Approach Delay (s)	61.1					20.6	
Approach LOS	E					C	

Intersection Summary

HCM Average Control Delay	32.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group