












# HCM 2010 Signalized Intersection Capacity Analysis

## 1: Shafers School House Rd & SR 611

3/11/2015

									
Movement	SET	SER	NWL	NWT	NEL	NER			
Lane Configurations									
Volume (vph)	856	39	70	1018	83	83			
Movement Number	2	12	1	6	3	18			
Initial Queue, veh	0	0	0	0	0	0			
Ped-Bike Adj. Factor (A <sub>pbT</sub> )		1.00	1.00		1.00	1.00			
Parking, Bus Adj. Factors	1.00	1.00	1.00	1.00	1.00	1.00			
Adj. Sat. Flow Rate, veh/h/ln	1806	1806	1768	1872	1808	1793			
Lanes	1	0	1	1	1	1			
Lane Assignment									
Capacity, veh/h	1297	84	348	1447	184	163			
Proportion Arriving On Green	0.77	0.77	0.27	0.38	0.11	0.11			
Movement Delay, s/veh	0.0	7.9	34.9	26.6	49.8	49.4			
Movement LOS		A	C	C	D	D			
Approach Volume, veh/h	970			1237	217				
Approach Delay, s/veh	7.9			27.2	49.6				
Approach LOS	A			C	D				
Timer:		1	2	3	4	5	6	7	8
Assigned Phase			2				6		8
Case No			8.0				6.0		9.0
Phase Duration (G+Y+Rc), s			83.30				83.30		16.67
Change Period (Y+Rc), s			6.00				6.00		6.00
Max. Allowable Headway (MAH), s			6.71				6.71		4.50
Maximum Green Setting (Gmax), s			77.30				77.30		10.70
Max. Queue Clearance Time (g <sub>c</sub> +l1), s			28.91				57.00		8.51
Green Extension Time (g <sub>e</sub> ), s			43.11				19.21		0.18
Probability of Phase Call (p <sub>c</sub> )			1.000				1.000		0.998
Probability of Max Out (p <sub>x</sub> )			0.870				0.955		1.000
Left-Turn Movement Data									
Assigned Movement							1		3
Mvmt. Sat Flow, veh/h							547.93		1721.68
Through Movement Data									
Assigned Movement			2				6		
Mvmt. Sat Flow, veh/h			1677.86				1872.06		
Right-Turn Movement Data									
Assigned Movement			12				16		18
Mvmt. Sat Flow, veh/h			108.88				0.00		1524.08
Left Lane Group Data									
Assigned Movement		0	0	0	0	0	1	0	3
Lane Assignment							L		L
Lanes in Group		0	0	0	0	0	1	0	1
Group Volume (v), veh/h		0.0	0.0	0.0	0.0	0.0	80.5	0.0	116.9
Group Sat. Flow (s), veh/h/ln		0.0	0.0	0.0	0.0	0.0	547.9	0.0	1721.7
Queue Serve Time (g <sub>s</sub> ), s		0.0	0.0	0.0	0.0	0.0	12.7	0.0	6.5
Cycle Queue Clear Time (g <sub>c</sub> ), s		0.0	0.0	0.0	0.0	0.0	39.6	0.0	6.5

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Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	0.0	0.0	0.0	0.0	547.9	0.0	1721.7
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	0.0	0.0	77.3	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	50.4	0.0	0.0
Perm LT Que Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	12.7	0.0	0.0
Time to First Blk (g_f), s	0.0	77.3	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	0.000	0.000	0.000	0.000	1.000	0.000	1.000
Lane Group Capacity (c), veh/h	0.0	0.0	0.0	0.0	0.0	348.2	0.0	183.8
Volume-to-Capacity Ratio (X)	0.000	0.000	0.000	0.000	0.000	0.231	0.000	0.636
Available Capacity (c_a), veh/h	0.0	0.0	0.0	0.0	0.0	348.2	0.0	184.3
Upstream Filter Factor (I)	0.000	0.000	0.000	0.000	0.000	0.639	0.000	1.000
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	34.3	0.0	42.8
Incremental Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.6	0.0	7.0
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	34.9	0.0	49.8
First-Term Queue (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	1.8	0.0	2.7
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4
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	0.000	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	1.9	0.0	3.1
Percentile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.17
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
<b>Middle Lane Group Data</b>								
Assigned Movement	0	2	0	0	0	6	0	0
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	1156.8	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	0.0	0.0	0.0	0.0	1872.1	0.0	0.0
Queue Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	55.0	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	55.0	0.0	0.0
Lane Group Capacity (c), veh/h	0.0	0.0	0.0	0.0	0.0	1447.5	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	0.000	0.000	0.000	0.799	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	0.0	0.0	0.0	1447.5	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	0.000	0.000	0.000	0.639	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	24.1	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	2.6	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	26.6	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	25.7	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	1.0	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	0.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	0.0	0.0	0.0	26.7	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00

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

















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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
<b>Right Lane Group Data</b>								
Assigned Movement	0	12	0	0	0	16	0	18
Lane Assignment	T+R						R	
Lanes in Group	0	1	0	0	0	0	0	1
Group Volume (v), veh/h	0.0	969.7	0.0	0.0	0.0	0.0	0.0	100.0
Group Sat. Flow (s), veh/h/ln	0.0	1786.7	0.0	0.0	0.0	0.0	0.0	1524.1
Queue Serve Time (g_s), s	0.0	26.9	0.0	0.0	0.0	0.0	0.0	6.3
Cycle Queue Clear Time (g_c), s	0.0	26.9	0.0	0.0	0.0	0.0	0.0	6.3
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	0.061	0.000	0.000	0.000	0.000	0.000	1.000
Lane Group Capacity (c), veh/h	0.0	1381.5	0.0	0.0	0.0	0.0	0.0	162.7
Volume-to-Capacity Ratio (X)	0.000	0.702	0.000	0.000	0.000	0.000	0.000	0.615
Available Capacity (c_a), veh/h	0.0	1381.5	0.0	0.0	0.0	0.0	0.0	163.1
Upstream Filter Factor (I)	0.000	1.000	0.000	0.000	0.000	0.000	0.000	1.000
Uniform Delay (d1), s/veh	0.0	5.6	0.0	0.0	0.0	0.0	0.0	42.7
Incremental Delay (d2), s/veh	0.0	2.3	0.0	0.0	0.0	0.0	0.0	6.7
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	7.9	0.0	0.0	0.0	0.0	0.0	49.4
First-Term Queue (Q1), veh/ln	0.0	5.8	0.0	0.0	0.0	0.0	0.0	2.3
Second-Term Queue (Q2), veh/ln	0.0	0.9	0.0	0.0	0.0	0.0	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	0.000	0.000	1.000	0.000	1.000
Percentile Back of Queue (Q%), veh/ln	0.0	6.7	0.0	0.0	0.0	0.0	0.0	2.6
Percentile Storage Ratio (RQ%)	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.43
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
<b>Intersection Summary</b>								
HCM Average Control Delay	21.5							
HCM Level of Service	C							

# HCM 2010 Signalized Intersection Capacity Analysis

## 2: Applegate Rd/Terrace Dr & SR 611

3/11/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	812	31	31	969	14	36	3	32	8	2	24
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 <sub>pbT</sub> )	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	1890	1873	1873	1890	1872	1872	1881	1911	1911	1884	1884	1884
Lanes	1	1	0	1	1	0	1	1	0	0	1	0
Lane Assignment												
Capacity, veh/h	335	1386	59	496	1421	30	144	32	115	56	22	93
Proportion Arriving On Green	0.97	0.94	0.94	0.78	0.78	0.78	0.09	0.09	0.09	0.09	0.09	0.09
Movement Delay, s/veh	7.3	0.0	2.2	5.3	0.0	8.7	49.6	0.0	46.3	45.9	0.0	0.0
Movement LOS	A		A	A		A	D		D	D		
Approach Volume, veh/h		960			1099			105			57	
Approach Delay, s/veh		2.3			8.6			47.9			45.9	
Approach LOS		A			A			D			D	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phase			2		4		6		8			
Case No			6.0		8.0		6.0		6.0			
Phase Duration (G+Y+Rc), s			87.30		16.60		87.30		16.60			
Change Period (Y+Rc), s			6.50		7.50		6.50		7.50			
Max. Allowable Headway (MAH), s			7.20		4.59		7.20		4.59			
Maximum Green Setting (Gmax), s			80.80		9.10		80.80		9.10			
Max. Queue Clearance Time (g <sub>c</sub> +l <sub>1</sub> ), s			34.24		5.37		31.90		9.19			
Green Extension Time (g <sub>e</sub> ), s			41.41		0.19		43.26		0.00			
Probability of Phase Call (p <sub>c</sub> )			1.000		0.991		1.000		0.991			
Probability of Max Out (p <sub>x</sub> )			0.868		1.000		0.861		1.000			
Left-Turn Movement Data												
Assigned Movement			5		7		1		3			
Mvmt. Sat Flow, veh/h			541.94		305.54		607.86		1353.62			
Through Movement Data												
Assigned Movement			2		4		6		8			
Mvmt. Sat Flow, veh/h			1782.59		102.36		1827.25		368.78			
Right-Turn Movement Data												
Assigned Movement			12		14		16		18			
Mvmt. Sat Flow, veh/h			76.46		1058.86		38.18		1311.23			
Left Lane Group Data												
Assigned Movement		0	5	0	7	0	1	0	3			
Lane Assignment			L		L+T+R		L		L			
Lanes in Group		0	1	0	1	0	1	0	1			
Group Volume (v), veh/h		0.0	29.3	0.0	57.3	0.0	47.0	0.0	50.7			
Group Sat. Flow (s), veh/h/ln		0.0	541.9	0.0	1466.8	0.0	607.9	0.0	1353.6			
Queue Serve Time (g <sub>s</sub> ), s		0.0	2.3	0.0	0.0	0.0	2.6	0.0	3.8			
Cycle Queue Clear Time (g <sub>c</sub> ), s		0.0	32.2	0.0	3.4	0.0	10.5	0.0	7.2			

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## 2: Applegate Rd/Terrace Dr & SR 611

3/11/2015

Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	541.9	0.0	773.0	0.0	607.9	0.0	1353.6
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	80.8	0.0	9.1	0.0	80.8	0.0	9.1
Perm LT Serve Time (g_u), s	0.0	50.9	0.0	5.9	0.0	72.9	0.0	5.7
Perm LT Que Serve Time (g_ps), s	0.0	2.3	0.0	0.0	0.0	2.6	0.0	3.8
Time to First Blk (g_f), s	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0
Proportion LT Inside Lane (P_L)	0.000	1.000	0.000	0.208	0.000	1.000	0.000	1.000
Lane Group Capacity (c), veh/h	0.0	334.8	0.0	170.3	0.0	496.0	0.0	144.0
Volume-to-Capacity Ratio (X)	0.000	0.087	0.000	0.337	0.000	0.095	0.000	0.352
Available Capacity (c_a), veh/h	0.0	334.8	0.0	170.3	0.0	496.0	0.0	144.0
Upstream Filter Factor (I)	0.000	0.660	0.000	1.000	0.000	1.000	0.000	1.000
Uniform Delay (d1), s/veh	0.0	7.1	0.0	44.8	0.0	5.0	0.0	48.2
Incremental Delay (d2), s/veh	0.0	0.3	0.0	1.2	0.0	0.3	0.0	1.5
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	7.3	0.0	45.9	0.0	5.3	0.0	49.6
First-Term Queue (Q1), veh/ln	0.0	0.2	0.0	1.4	0.0	0.3	0.0	1.3
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.1	0.0	0.0	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	1.000	0.000	1.000	0.000	1.000	0.000	1.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.2	0.0	1.5	0.0	0.3	0.0	1.4
Percentile Storage Ratio (RQ%)	0.00	0.08	0.00	0.08	0.00	0.11	0.00	0.47
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

### 2: Applegate Rd/Terrace Dr & SR 611













3/11/2015

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
<b>Right Lane Group Data</b>								
Assigned Movement	0	12	0	14	0	16	0	18
Lane Assignment	T+R			T+R			T+R	
Lanes in Group	0	1	0	0	0	1	0	1
Group Volume (v), veh/h	0.0	930.6	0.0	0.0	0.0	1052.4	0.0	54.7
Group Sat. Flow (s), veh/h/ln	0.0	1859.0	0.0	0.0	0.0	1865.4	0.0	1680.0
Queue Serve Time (g_s), s	0.0	7.9	0.0	0.0	0.0	29.9	0.0	3.2
Cycle Queue Clear Time (g_c), s	0.0	7.9	0.0	0.0	0.0	29.9	0.0	3.2
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	0.041	0.000	0.722	0.000	0.020	0.000	0.780
Lane Group Capacity (c), veh/h	0.0	1445.7	0.0	0.0	0.0	1450.7	0.0	147.1
Volume-to-Capacity Ratio (X)	0.000	0.644	0.000	0.000	0.000	0.725	0.000	0.372
Available Capacity (c_a), veh/h	0.0	1445.7	0.0	0.0	0.0	1450.7	0.0	147.1
Upstream Filter Factor (I)	0.000	0.660	0.000	0.000	0.000	1.000	0.000	1.000
Uniform Delay (d1), s/veh	0.0	0.9	0.0	0.0	0.0	5.9	0.0	44.7
Incremental Delay (d2), s/veh	0.0	1.2	0.0	0.0	0.0	2.8	0.0	1.6
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	2.2	0.0	0.0	0.0	8.7	0.0	46.3
First-Term Queue (Q1), veh/ln	0.0	0.8	0.0	0.0	0.0	6.9	0.0	1.3
Second-Term Queue (Q2), veh/ln	0.0	0.5	0.0	0.0	0.0	1.1	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	1.000	0.000	1.000	0.000	1.000	0.000	1.000
Percentile Back of Queue (Q%), veh/ln	0.0	1.3	0.0	0.0	0.0	8.0	0.0	1.4
Percentile Storage Ratio (RQ%)	0.00	0.02	0.00	0.00	0.00	0.23	0.00	0.07
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
<b>Intersection Summary</b>								
HCM Average Control Delay	8.7							
HCM Level of Service	A							

# HCM 2010 Signalized Intersection Capacity Analysis

## 3: SR 611 & Pocono Commons Dr

3/25/2015

									
Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Lane Configurations									
Volume (vph)	274	564	832	217	186	337			
Movement Number	5	2	6	16	7	14			
Initial Queue, veh	0	0	0	0	0	0			
Ped-Bike Adj. Factor (A <sub>pbT</sub> )	1.00			1.00	1.00	1.00			
Parking, Bus Adj. Factors	1.00	1.00	1.00	1.00	1.00	1.00			
Adj. Sat. Flow Rate, veh/h/ln	1891	1872	1872	1947	1957	1957			
Lanes	2	1	1	1	2	1			
Lane Assignment									
Capacity, veh/h	608	1440	992	877	383	466			
Proportion Arriving On Green	0.17	0.77	0.53	0.53	0.11	0.11			
Movement Delay, s/veh	39.4	4.6	48.5	13.4	44.2	86.7			
Movement LOS	D	A	D	B	D	F			
Approach Volume, veh/h		1004	1220		706				
Approach Delay, s/veh		17.5	41.6		73.2				
Approach LOS		B	D		E				
Timer:		1	2	3	4	5	6	7	8
Assigned Phase			2		4	5	6		
Case No			4.0		9.0	2.0	7.0		
Phase Duration (G+Y+Rc), s			83.40		16.60	23.90	59.50		
Change Period (Y+Rc), s			6.50		6.00	6.50	6.50		
Max. Allowable Headway (MAH), s			6.63		3.63	3.18	6.63		
Maximum Green Setting (Gmax), s			76.90		10.60	17.40	53.00		
Max. Queue Clearance Time (g <sub>c</sub> +l <sub>1</sub> ), s			13.82		12.60	11.79	53.52		
Green Extension Time (g <sub>e</sub> ), s			41.79		0.00	0.50	0.00		
Probability of Phase Call (p <sub>c</sub> )			1.000		1.000	1.000	1.000		
Probability of Max Out (p <sub>x</sub> )			0.552		1.000	0.144	1.000		
Left-Turn Movement Data									
Assigned Movement					7	5			
Mvmt. Sat Flow, veh/h					3615.10	3493.10			
Through Movement Data									
Assigned Movement			2			6			
Mvmt. Sat Flow, veh/h			1872.06			1871.78			
Right-Turn Movement Data									
Assigned Movement			12		14		16		
Mvmt. Sat Flow, veh/h			0.00		1663.13		1654.66		
Left Lane Group Data									
Assigned Movement		0	0	0	7	5	0	0	0
Lane Assignment					L	L (Prot)			
Lanes in Group		0	0	0	2	2	0	0	0
Group Volume (v), veh/h		0.0	0.0	0.0	224.1	370.3	0.0	0.0	0.0
Group Sat. Flow (s), veh/h/ln		0.0	0.0	0.0	1807.6	1746.5	0.0	0.0	0.0
Queue Serve Time (g <sub>s</sub> ), s		0.0	0.0	0.0	5.9	9.8	0.0	0.0	0.0
Cycle Queue Clear Time (g <sub>c</sub> ), s		0.0	0.0	0.0	5.9	9.8	0.0	0.0	0.0

# HCM 2010 Signalized Intersection Capacity Analysis

## 3: SR 611 & Pocono Commons Dr

3/25/2015

Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	0.0	0.0	1807.6	0.0	0.0	0.0	0.0
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Que Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	53.0	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	0.000	0.000	1.000	1.000	0.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	0.0	0.0	383.2	607.8	0.0	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	0.000	0.585	0.609	0.000	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	0.0	383.2	607.8	0.0	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	0.000	1.000	1.000	0.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	0.0	42.6	38.2	0.0	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	0.0	1.6	1.3	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	44.2	39.4	0.0	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	0.0	2.6	4.0	0.0	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.1	0.1	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	0.000	0.000	1.000	1.000	0.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	0.0	2.7	4.1	0.0	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.00	0.15	0.59	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

### Middle Lane Group Data

Assigned Movement	0	2	0	0	0	6	0	0
Lane Assignment	T			T				
Lanes in Group	0	1	0	0	0	1	0	0
Group Volume (v), veh/h	0.0	633.7	0.0	0.0	0.0	978.8	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1872.1	0.0	0.0	0.0	1871.8	0.0	0.0
Queue Serve Time (g_s), s	0.0	11.8	0.0	0.0	0.0	51.5	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	11.8	0.0	0.0	0.0	51.5	0.0	0.0
Lane Group Capacity (c), veh/h	0.0	1439.6	0.0	0.0	0.0	992.1	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.440	0.000	0.000	0.000	0.987	0.000	0.000
Available Capacity (c_a), veh/h	0.0	1439.6	0.0	0.0	0.0	992.1	0.0	0.0
Upstream Filter Factor (I)	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	4.0	0.0	0.0	0.0	23.2	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.6	0.0	0.0	0.0	25.4	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	4.6	0.0	0.0	0.0	48.5	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	2.7	0.0	0.0	0.0	19.5	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.2	0.0	0.0	0.0	7.0	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	0.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	3.0	0.0	0.0	0.0	26.5	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.24	0.00	0.00	0.00	0.70	0.00	0.00



# HCM 2010 Signalized Intersection Capacity Analysis

## 3: SR 611 & Pocono Commons Dr












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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
<b>Right Lane Group Data</b>								
Assigned Movement	0	12	0	14	0	16	0	0
Lane Assignment				R				R
Lanes in Group	0	0	0	1	0	1	0	0
Group Volume (v), veh/h	0.0	0.0	0.0	481.4	0.0	241.1	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	0.0	0.0	1663.1	0.0	1654.7	0.0	0.0
Queue Serve Time (g_s), s	0.0	0.0	0.0	10.6	0.0	8.0	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	0.0	0.0	10.6	0.0	8.0	0.0	0.0
Prot RT Sat Flow Rate (s_R), veh/h/ln	0.0	0.0	0.0	1663.1	0.0	0.0	0.0	0.0
Prot RT Eff. Green (g_R), s	0.0	0.0	0.0	17.4	0.0	0.0	0.0	0.0
Proportion RT Outside Lane (P_R)	0.000	0.000	0.000	1.000	0.000	1.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	0.0	0.0	465.7	0.0	877.0	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	0.000	1.034	0.000	0.275	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	0.0	465.7	0.0	877.0	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	0.000	1.000	0.000	1.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	0.0	36.0	0.0	12.9	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	0.0	50.7	0.0	0.5	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	86.7	0.0	13.4	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	0.0	12.9	0.0	2.7	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	6.6	0.0	0.1	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	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	0.0	19.5	0.0	2.8	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.00	3.30	0.00	0.25	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	3.9	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
<b>Intersection Summary</b>								
HCM Average Control Delay	40.9							
HCM Level of Service	D							

# HCM 2010 Signalized Intersection Capacity Analysis

## 6: SR 611 & Connector Rd

3/11/2015

									
Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Lane Configurations									
Volume (vph)	239	610	721	322	328	265			
Movement Number	5	2	6	16	7	14			
Initial Queue, veh	0	0	0	0	0	0			
Ped-Bike Adj. Factor (A <sub>pbT</sub> )	1.00			1.00	1.00	1.00			
Parking, Bus Adj. Factors	1.00	1.00	1.00	1.00	1.00	1.00			
Adj. Sat. Flow Rate, veh/h/ln	1900	1900	1900	1900	1900	1900			
Lanes	1	2	2	0	1	1			
Lane Assignment									
Capacity, veh/h	476	3388	1531	682	0	0			
Proportion Arriving On Green	0.26	0.94	0.61	0.61	0.00	0.00			
Movement Delay, s/veh	22.1	0.2	7.5	7.6	0.0	0.0			
Movement LOS	C	A	A	A					
Approach Volume, veh/h		943	1159		0				
Approach Delay, s/veh		6.4	7.6		0.0				
Approach LOS		A	A						
Timer:		1	2	3	4	5	6	7	8
Assigned Phase			2		4	5	6		
Case No			4.0		0.0	2.0	8.0		
Phase Duration (G+Y+Rc), s			64.91		0.00	21.06	43.85		
Change Period (Y+Rc), s			4.00		4.00	4.00	4.00		
Max. Allowable Headway (MAH), s			5.22		0.00	3.80	5.22		
Maximum Green Setting (Gmax), s			61.00		31.00	17.20	39.80		
Max. Queue Clearance Time (g <sub>c</sub> +I1), s			2.92		0.00	10.23	13.91		
Green Extension Time (g <sub>e</sub> ), s			20.92		0.00	0.44	14.76		
Probability of Phase Call (p <sub>c</sub> )			1.000		0.000	0.992	1.000		
Probability of Max Out (p <sub>x</sub> )			0.149		0.000	0.120	0.475		
Left-Turn Movement Data									
Assigned Movement					7	5			
Mvmt. Sat Flow, veh/h					0.00	1809.52			
Through Movement Data									
Assigned Movement			2				6		
Mvmt. Sat Flow, veh/h			3705.00				2493.59		
Right-Turn Movement Data									
Assigned Movement			12				16		
Mvmt. Sat Flow, veh/h			0.00				1110.45		
Left Lane Group Data									
Assigned Movement		0	0	0	7	5	0	0	0
Lane Assignment					L (Prot)				
Lanes in Group		0	0	0	0	1	0	0	0
Group Volume (v), veh/h		0.0	0.0	0.0	0.0	265.6	0.0	0.0	0.0
Group Sat. Flow (s), veh/h/ln		0.0	0.0	0.0	0.0	1809.5	0.0	0.0	0.0
Queue Serve Time (g <sub>s</sub> ), s		0.0	0.0	0.0	0.0	8.2	0.0	0.0	0.0
Cycle Queue Clear Time (g <sub>c</sub> ), s		0.0	0.0	0.0	0.0	8.2	0.0	0.0	0.0

# HCM 2010 Signalized Intersection Capacity Analysis

## 6: SR 611 & Connector Rd

3/11/2015

Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Que Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	39.9	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	0.000	0.000	0.000	1.000	0.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	0.0	0.0	0.0	475.5	0.0	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	0.000	0.000	0.558	0.000	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	0.0	0.0	479.5	0.0	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	20.7	0.0	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	0.0	0.0	1.4	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	22.1	0.0	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	0.0	0.0	3.2	0.0	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.0	0.2	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	0.000	0.000	1.000	1.000	0.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.57	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

### Middle Lane Group Data

Assigned Movement	0	2	0	0	0	6	0	0
Lane Assignment	T				T			
Lanes in Group	0	2	0	0	0	1	0	0
Group Volume (v), veh/h	0.0	677.8	0.0	0.0	0.0	609.9	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1805.0	0.0	0.0	0.0	1900.0	0.0	0.0
Queue Serve Time (g_s), s	0.0	0.9	0.0	0.0	0.0	11.8	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	0.9	0.0	0.0	0.0	11.8	0.0	0.0
Lane Group Capacity (c), veh/h	0.0	3387.5	0.0	0.0	0.0	1166.5	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.200	0.000	0.000	0.000	0.523	0.000	0.000
Available Capacity (c_a), veh/h	0.0	3392.7	0.0	0.0	0.0	1166.5	0.0	0.0
Upstream Filter Factor (I)	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.2	0.0	0.0	0.0	7.1	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.4	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	0.2	0.0	0.0	0.0	7.5	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	-0.6	0.0	0.0	0.0	3.5	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.1	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	0.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	-0.6	0.0	0.0	0.0	3.6	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	-0.01	0.00	0.00	0.00	0.12	0.00	0.00

# HCM 2010 Signalized Intersection Capacity Analysis

## 6: SR 611 & Connector Rd

3/11/2015

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
<b>Right Lane Group Data</b>								
Assigned Movement	0	12	0	0	0	16	0	0
Lane Assignment	T+R							
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	549.0	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	0.0	0.0	0.0	0.0	1704.0	0.0	0.0
Queue Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	11.9	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	11.9	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	0.000	0.000	0.000	0.000	0.652	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	0.0	0.0	0.0	0.0	1046.2	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	0.000	0.000	0.000	0.525	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	0.0	0.0	0.0	1046.2	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	7.1	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.5	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	7.6	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.1	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	0.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.11	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
<b>Intersection Summary</b>								
HCM Average Control Delay	7.0							
HCM Level of Service	A							

**Intersection**

Intersection Delay (sec/veh): 2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	0	0	0	1	1	269	1	324	0	0	239	322
Conflicting Peds. (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Right Turn Channelized	None	None	None	Yield	Yield	Yield	None	None	None	None	None	None
Storage Length	0		0	0		0	0		0	0		0
Median Width		0			0			0			0	
Grade (%)		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles(%)	0	0	0	0	0	0	0	0	0	0	0	0
Movement Flow Rate	0	0	0	1	1	299	1	360	0	0	266	358
Number of Lanes	0	0	0	0	1	0	0	2	0	0	1	1

Major/Minor	Minor 1			Major 1			Major 2		
Conflicting Flow Rate - All	628	628	180	623	0	-	-	0	0
Stage 1	362	362	0	0	0	-	-	0	0
Stage 2	266	266	0	0	0	-	-	0	0
Follow-up Headway	3.5	4	3.3	2.2	-	-	-	0	0
Pot Capacity-1 Maneuver	385	402	838	967	-	-	-	-	-
Stage 1	648	629	-	-	-	-	-	-	-
Stage 2	733	692	-	-	-	-	-	-	-
Mov Capacity-1 Maneuver	-	401.6	838	967	-	-	-	-	-
Mov Capacity-2 Maneuver	-	401.6	-	-	-	-	-	-	-
Stage 1	648	628.4	-	-	-	-	-	-	-
Stage 2	733	# 0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay (s)	11.6	0	0
HCM LOS	B	A	A

Lane	NBL	NBT	WBLn1	SBT	SBR
Capacity (vph)			844		
HCM Control Delay (s)	8.727	0	11.6	-	-
HCM Lane VC Ratio	0.001	-	0.357	0	-
HCM Lane LOS	A	-	B	-	-
HCM 95th Percentile Queue (veh)	0.003	-	1.625	0	-

**Intersection**

Intersection Delay (sec/veh): 0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Volume (vph)	324	1	0	0	239	0
Conflicting Peds. (#/hr)	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
Right Turn Channelized	None	None	None	None	None	None
Storage Length	0			0	0	0
Median Width		0	0		12	
Grade (%)		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles(%)	0	0	0	0	0	0
Movement Flow Rate	360	1	0	0	266	0
Number of Lanes	0	1	0	0	1	0

**Major/Minor** Minor 1

Conflicting Flow Rate - All	0	531		0	-
Stage 1	0	531		0	-
Stage 2	0	0		0	-
Follow-up Headway	-	0		-	-
Pot Capacity-1 Maneuver	-	-		-	-
Stage 1	-	-		-	-
Stage 2	-	-		-	-
Mov Capacity-1 Maneuver	-	# 0		-	-
Mov Capacity-2 Maneuver	-	# 0		-	-
Stage 1	-	# 0		-	-
Stage 2	-	# 0		-	-

**Approach** EB SB

HCM Control Delay (s)	-	0
HCM LOS	-	A













**Lane** EBLn1 SBL

Capacity (vph)	-	
HCM Control Delay (s)	-	-
HCM Lane VC Ratio	-	-
HCM Lane LOS	-	-
HCM 95th Percentile Queue (veh)	-	-

# HCM 2010 Signalized Intersection Capacity Analysis

## 1: Bridge St & SR 611

3/26/2015

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations									
Volume (vph)	624	98	228	765	141	208			
Movement Number	2	12	1	6	3	18			
Initial Queue, veh	0	0	0	0	0	0			
Ped-Bike Adj. Factor (A <sub>pbT</sub> )		1.00	1.00		1.00	1.00			
Parking, Bus Adj. Factors	1.00	1.00	1.00	1.00	1.00	1.00			
Adj. Sat. Flow Rate, veh/h/ln	1891	1872	1853	1908	1806	1771			
Lanes	1	1	1	1	1	1			
Lane Assignment									
Capacity, veh/h	1330	1119	0	1342	274	240			
Proportion Arriving On Green	0.70	0.70	0.00	0.20	0.16	0.16			
Movement Delay, s/veh	7.0	4.2	0.0	25.1	35.9	74.1			
Movement LOS	A	A		C	D	E			
Approach Volume, veh/h	767			823	370				
Approach Delay, s/veh	6.6			25.1	58.8				
Approach LOS	A			C	E				
Timer:		1	2	3	4	5	6	7	8
Assigned Phase			2				6		8
Case No			7.0				4.0		9.0
Phase Duration (G+Y+Rc), s			67.40				67.40		19.90
Change Period (Y+Rc), s			6.00				6.00		6.00
Max. Allowable Headway (MAH), s			7.23				7.23		4.45
Maximum Green Setting (Gmax), s			52.50				69.10		13.90
Max. Queue Clearance Time (g <sub>c</sub> +l1), s			16.01				36.24		14.65
Green Extension Time (g <sub>e</sub> ), s			26.91				17.13		0.00
Probability of Phase Call (p <sub>c</sub> )			1.000				1.000		1.000
Probability of Max Out (p <sub>x</sub> )			0.685				0.718		1.000
Left-Turn Movement Data									
Assigned Movement									3
Mvmt. Sat Flow, veh/h									1719.94
Through Movement Data									
Assigned Movement			2				6		
Mvmt. Sat Flow, veh/h			1890.69				1908.20		
Right-Turn Movement Data									
Assigned Movement			12				16		18
Mvmt. Sat Flow, veh/h			1591.48				0.00		1505.24
Left Lane Group Data									
Assigned Movement		0	0	0	0	0	0	0	3
Lane Assignment									L
Lanes in Group		0	0	0	0	0	0	0	1
Group Volume (v), veh/h		0.0	0.0	0.0	0.0	0.0	0.0	0.0	148.4
Group Sat. Flow (s), veh/h/ln		0.0	0.0	0.0	0.0	0.0	0.0	0.0	1719.9
Queue Serve Time (g <sub>s</sub> ), s		0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.9
Cycle Queue Clear Time (g <sub>c</sub> ), s		0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.9

# HCM 2010 Signalized Intersection Capacity Analysis

## 1: Bridge St & SR 611

3/26/2015

Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1719.9
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	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Que Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	61.4	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	0.000	0.000	0.000	0.000	0.000	0.000	1.000
Lane Group Capacity (c), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	273.9
Volume-to-Capacity Ratio (X)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.542
Available Capacity (c_a), veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	273.9
Upstream Filter Factor (I)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.8
Incremental Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2
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	35.9
First-Term Queue (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
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	0.000	0.000	0.000	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	3.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
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	0	0	6	0	0
Lane Assignment	T		T					
Lanes in Group	0	1	0	0	0	1	0	0
Group Volume (v), veh/h	0.0	663.8	0.0	0.0	0.0	822.6	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1890.7	0.0	0.0	0.0	1908.2	0.0	0.0
Queue Serve Time (g_s), s	0.0	14.0	0.0	0.0	0.0	34.2	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	14.0	0.0	0.0	0.0	34.2	0.0	0.0
Lane Group Capacity (c), veh/h	0.0	1329.7	0.0	0.0	0.0	1342.1	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.499	0.000	0.000	0.000	0.613	0.000	0.000
Available Capacity (c_a), veh/h	0.0	1329.7	0.0	0.0	0.0	1510.5	0.0	0.0
Upstream Filter Factor (I)	0.000	1.000	0.000	0.000	0.000	0.701	0.000	0.000
Uniform Delay (d1), s/veh	0.0	5.9	0.0	0.0	0.0	23.9	0.0	0.0
Incremental Delay (d2), s/veh	0.0	1.1	0.0	0.0	0.0	1.2	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	7.0	0.0	0.0	0.0	25.1	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	4.2	0.0	0.0	0.0	17.3	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.4	0.0	0.0	0.0	0.4	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	0.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	4.6	0.0	0.0	0.0	17.7	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.12	0.00	0.00	0.00	0.75	0.00	0.00



# HCM 2010 Signalized Intersection Capacity Analysis

## 1: Bridge St & SR 611





















3/26/2015

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
<b>Right Lane Group Data</b>								
Assigned Movement	0	12	0	0	0	16	0	18
Lane Assignment	R				R			
Lanes in Group	0	1	0	0	0	0	0	1
Group Volume (v), veh/h	0.0	103.2	0.0	0.0	0.0	0.0	0.0	221.3
Group Sat. Flow (s), veh/h/ln	0.0	1591.5	0.0	0.0	0.0	0.0	0.0	1505.2
Queue Serve Time (g_s), s	0.0	1.8	0.0	0.0	0.0	0.0	0.0	12.6
Cycle Queue Clear Time (g_c), s	0.0	1.8	0.0	0.0	0.0	0.0	0.0	12.6
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	1.000	0.000	0.000	0.000	0.000	0.000	1.000
Lane Group Capacity (c), veh/h	0.0	1119.3	0.0	0.0	0.0	0.0	0.0	239.7
Volume-to-Capacity Ratio (X)	0.000	0.092	0.000	0.000	0.000	0.000	0.000	0.923
Available Capacity (c_a), veh/h	0.0	1119.3	0.0	0.0	0.0	0.0	0.0	239.7
Upstream Filter Factor (I)	0.000	1.000	0.000	0.000	0.000	0.000	0.000	1.000
Uniform Delay (d1), s/veh	0.0	4.1	0.0	0.0	0.0	0.0	0.0	36.2
Incremental Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.0	0.0	0.0	37.9
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	4.2	0.0	0.0	0.0	0.0	0.0	74.1
First-Term Queue (Q1), veh/ln	0.0	0.5	0.0	0.0	0.0	0.0	0.0	4.5
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5
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	0.000	0.000	1.000	0.000	1.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.5	0.0	0.0	0.0	0.0	0.0	7.0
Percentile Storage Ratio (RQ%)	0.00	0.07	0.00	0.00	0.00	0.00	0.00	1.24
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
<b>Intersection Summary</b>								
HCM Average Control Delay	24.2							
HCM Level of Service	C							

# HCM 2010 Signalized Intersection Capacity Analysis

## 2: Commercial Driveway/Stroud Mall Main Dr & SR 611

3/11/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	172	834	13	13	826	66	23	4	11	99	3	156
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 <sub>pbT</sub> )	1.00		0.98	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	1881	1882	1882	1900	1937	1976	1986	1986	1986	2025	2025	2005
Lanes	1	1	0	1	1	1	0	1	0	0	1	1
Lane Assignment												
Capacity, veh/h	0	1392	26	435	1466	1271	67	32	11	200	5	198
Proportion Arriving On Green	0.00	0.85	0.85	0.22	0.21	0.10	0.12	0.12	0.12	0.12	0.12	0.12
Movement Delay, s/veh	0.0	0.0	4.5	22.9	25.5	12.2	48.7	0.0	0.0	44.8	0.0	82.3
Movement LOS			A	C	C	B	D			D		F
Approach Volume, veh/h		934			959			63			297	
Approach Delay, s/veh		4.5			24.4			48.7			67.7	
Approach LOS		A			C			D			E	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phase			2		4		6		8			
Case No			4.0		7.0		5.3		8.0			
Phase Duration (G+Y+Rc), s			77.90		17.10		77.90		17.10			
Change Period (Y+Rc), s			6.00		6.00		6.00		6.00			
Max. Allowable Headway (MAH), s			1.46		4.64		1.46		4.64			
Maximum Green Setting (G <sub>max</sub> ), s			71.90		11.10		57.40		11.10			
Max. Queue Clearance Time (g <sub>c</sub> +I <sub>1</sub> ), s			17.83		12.04		40.12		13.10			
Green Extension Time (g <sub>e</sub> ), s			0.38		0.00		0.38		0.00			
Probability of Phase Call (p <sub>c</sub> )			1.000		1.000		1.000		1.000			
Probability of Max Out (p <sub>x</sub> )			0.000		1.000		0.000		1.000			
Left-Turn Movement Data												
Assigned Movement					7		1		3			
Mvmt. Sat Flow, veh/h					1077.51		608.76		232.63			
Through Movement Data												
Assigned Movement			2		4		6		8			
Mvmt. Sat Flow, veh/h			1839.66		38.75		1937.25		111.67			
Right-Turn Movement Data												
Assigned Movement			12		14		16		18			
Mvmt. Sat Flow, veh/h			34.79		1697.25		1679.60		92.49			
Left Lane Group Data												
Assigned Movement		0	0	0	7	0	1	0	3			
Lane Assignment					L+T		L		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	115.2	0.0	21.7	0.0	62.6			
Group Sat. Flow (s), veh/h/ln		0.0	0.0	0.0	1116.3	0.0	608.8	0.0	436.8			
Queue Serve Time (g <sub>s</sub> ), s		0.0	0.0	0.0	0.0	0.0	2.8	0.0	1.4			
Cycle Queue Clear Time (g <sub>c</sub> ), s		0.0	0.0	0.0	9.7	0.0	18.6	0.0	11.1			

# HCM 2010 Signalized Intersection Capacity Analysis

## 2: Commercial Driveway/Stroud Mall Main Dr & SR 611

3/11/2015

Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	0.0	0.0	769.1	0.0	608.8	0.0	742.2
Shared LT Sat Flow (s_sh), veh/h/ln	0.0	0.0	0.0	1112.8	0.0	0.0	0.0	0.0
Perm LT Eff. Green (g_p), s	0.0	0.0	0.0	11.1	0.0	71.9	0.0	11.1
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	56.1	0.0	1.4
Perm LT Que Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	2.8	0.0	1.4
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
Proportion LT Inside Lane (P_L)	0.000	0.000	0.000	0.965	0.000	1.000	0.000	0.533
Lane Group Capacity (c), veh/h	0.0	0.0	0.0	204.9	0.0	435.1	0.0	109.1
Volume-to-Capacity Ratio (X)	0.000	0.000	0.000	0.562	0.000	0.050	0.000	0.574
Available Capacity (c_a), veh/h	0.0	0.0	0.0	204.9	0.0	435.1	0.0	109.1
Upstream Filter Factor (I)	0.000	0.000	0.000	1.000	0.000	0.700	0.000	1.000
Uniform Delay (d1), s/veh	0.0	0.0	0.0	41.3	0.0	22.8	0.0	41.6
Incremental Delay (d2), s/veh	0.0	0.0	0.0	3.5	0.0	0.2	0.0	7.1
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	44.8	0.0	22.9	0.0	48.7
First-Term Queue (Q1), veh/ln	0.0	0.0	0.0	2.9	0.0	0.5	0.0	1.5
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2
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	3.1	0.0	0.5	0.0	1.7
Percentile Storage Ratio (RQ%)	0.00	0.00	0.00	0.17	0.00	0.16	0.00	0.09
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	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	860.4	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	0.0	0.0	0.0	0.0	1937.3	0.0	0.0
Queue Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	38.1	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	38.1	0.0	0.0
Lane Group Capacity (c), veh/h	0.0	0.0	0.0	0.0	0.0	1466.2	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	0.000	0.000	0.000	0.587	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	0.0	0.0	0.0	1466.2	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	0.000	0.000	0.000	0.700	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	24.3	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	1.2	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	25.5	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	19.7	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.5	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	20.2	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	1.95	0.00	0.00

# HCM 2010 Signalized Intersection Capacity Analysis

## 2: Commercial Driveway/Stroud Mall Main Dr & SR 611













3/11/2015

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
<b>Right Lane Group Data</b>								
Assigned Movement	0	12	0	14	0	16	0	18
Lane Assignment	T+R		R		R			
Lanes in Group	0	1	0	1	0	1	0	0
Group Volume (v), veh/h	0.0	933.8	0.0	181.4	0.0	76.7	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1874.4	0.0	1697.3	0.0	1679.6	0.0	0.0
Queue Serve Time (g_s), s	0.0	15.8	0.0	10.0	0.0	3.9	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	15.8	0.0	10.0	0.0	3.9	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	0.019	0.000	1.000	0.000	1.000	0.000	0.212
Lane Group Capacity (c), veh/h	0.0	1418.7	0.0	198.3	0.0	1271.2	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.658	0.000	0.915	0.000	0.060	0.000	0.000
Available Capacity (c_a), veh/h	0.0	1418.7	0.0	198.3	0.0	1271.2	0.0	0.0
Upstream Filter Factor (I)	0.000	0.681	0.000	1.000	0.000	0.700	0.000	0.000
Uniform Delay (d1), s/veh	0.0	2.9	0.0	41.5	0.0	12.2	0.0	0.0
Incremental Delay (d2), s/veh	0.0	1.6	0.0	40.8	0.0	0.1	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	4.5	0.0	82.3	0.0	12.2	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	2.7	0.0	4.2	0.0	1.1	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.6	0.0	2.3	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	3.3	0.0	6.4	0.0	1.2	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.14	0.00	1.30	0.00	0.19	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
<b>Intersection Summary</b>								
HCM Average Control Delay	22.5							
HCM Level of Service	C							

# HCM 2010 Signalized Intersection Capacity Analysis

## 3: SR 611 & Stroud Mall East Dr

3/11/2015

									
Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Lane Configurations									
Volume (vph)	19	686	839	77	36	63			
Movement Number	5	2	6	16	7	14			
Initial Queue, veh	0	0	0	0	0	0			
Ped-Bike Adj. Factor (A <sub>pbT</sub> )	1.00			1.00	1.00	1.00			
Parking, Bus Adj. Factors	1.00	1.00	1.00	1.00	1.00	1.00			
Adj. Sat. Flow Rate, veh/h/ln	1900	1863	1863	1900	1976	1937			
Lanes	1	1	1	1	1	1			
Lane Assignment									
Capacity, veh/h	0	1500	1500	1301	137	120			
Proportion Arriving On Green	0.00	0.62	0.26	0.01	0.07	0.07			
Movement Delay, s/veh	0.0	8.6	24.9	12.7	46.2	55.0			
Movement LOS		A	C	B	D	D			
Approach Volume, veh/h		762	1070		140				
Approach Delay, s/veh		8.6	23.7		51.0				
Approach LOS		A	C		D				
Timer:		1	2	3	4	5	6	7	8
Assigned Phase			2		4		6		
Case No			4.0		9.0		7.0		
Phase Duration (G+Y+Rc), s			85.20		13.14		85.20		
Change Period (Y+Rc), s			6.00		6.00		6.00		
Max. Allowable Headway (MAH), s			1.43		4.59		1.43		
Maximum Green Setting (Gmax), s			79.20		7.30		74.30		
Max. Queue Clearance Time (g <sub>c</sub> +l1), s			24.16		6.46		47.14		
Green Extension Time (g <sub>e</sub> ), s			0.34		0.04		0.34		
Probability of Phase Call (p <sub>c</sub> )			1.000		0.978		1.000		
Probability of Max Out (p <sub>x</sub> )			0.000		1.000		0.000		
Left-Turn Movement Data									
Assigned Movement					7				
Mvmt. Sat Flow, veh/h					1881.90				
Through Movement Data									
Assigned Movement			2				6		
Mvmt. Sat Flow, veh/h			1862.75				1862.75		
Right-Turn Movement Data									
Assigned Movement			12		14		16		
Mvmt. Sat Flow, veh/h			0.00		1646.67		1615.00		
Left Lane Group Data									
Assigned Movement		0	0	0	7	0	0	0	0
Lane Assignment					L				
Lanes in Group		0	0	0	1	0	0	0	0
Group Volume (v), veh/h		0.0	0.0	0.0	63.2	0.0	0.0	0.0	0.0
Group Sat. Flow (s), veh/h/ln		0.0	0.0	0.0	1881.9	0.0	0.0	0.0	0.0
Queue Serve Time (g <sub>s</sub> ), s		0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0
Cycle Queue Clear Time (g <sub>c</sub> ), s		0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0

# HCM 2010 Signalized Intersection Capacity Analysis

## 3: SR 611 & Stroud Mall East Dr

3/11/2015

Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	0.0	0.0	1881.9	0.0	0.0	0.0	0.0
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Que Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	79.2	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	0.000	0.000	1.000	0.000	0.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	0.0	0.0	136.6	0.0	0.0	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	0.000	0.462	0.000	0.000	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	0.0	139.7	0.0	0.0	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	0.0	43.8	0.0	0.0	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	0.0	2.4	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	46.2	0.0	0.0	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.1	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	0.000	0.000	1.000	0.000	0.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.00	0.09	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

### Middle Lane Group Data

Assigned Movement	0	2	0	0	0	6	0	0
Lane Assignment	T			T				
Lanes in Group	0	1	0	0	0	1	0	0
Group Volume (v), veh/h	0.0	762.2	0.0	0.0	0.0	964.4	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1862.7	0.0	0.0	0.0	1862.7	0.0	0.0
Queue Serve Time (g_s), s	0.0	22.2	0.0	0.0	0.0	45.1	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	22.2	0.0	0.0	0.0	45.1	0.0	0.0
Lane Group Capacity (c), veh/h	0.0	1500.2	0.0	0.0	0.0	1500.2	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.508	0.000	0.000	0.000	0.643	0.000	0.000
Available Capacity (c_a), veh/h	0.0	1500.2	0.0	0.0	0.0	1500.2	0.0	0.0
Upstream Filter Factor (I)	0.000	0.705	0.000	0.000	0.000	0.562	0.000	0.000
Uniform Delay (d1), s/veh	0.0	7.8	0.0	0.0	0.0	23.7	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.9	0.0	0.0	0.0	1.2	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	8.6	0.0	0.0	0.0	24.9	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	8.8	0.0	0.0	0.0	22.2	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.4	0.0	0.0	0.0	0.5	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	0.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	9.1	0.0	0.0	0.0	22.7	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.88	0.00	0.00	0.00	0.35	0.00	0.00

# HCM 2010 Signalized Intersection Capacity Analysis

## 3: SR 611 & Stroud Mall East Dr






















3/11/2015

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
<b>Right Lane Group Data</b>								
Assigned Movement	0	12	0	14	0	16	0	0
Lane Assignment				R				R
Lanes in Group	0	0	0	1	0	1	0	0
Group Volume (v), veh/h	0.0	0.0	0.0	76.8	0.0	105.5	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	0.0	0.0	1646.7	0.0	1615.0	0.0	0.0
Queue Serve Time (g_s), s	0.0	0.0	0.0	4.5	0.0	6.4	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	0.0	0.0	4.5	0.0	6.4	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	0.000	0.000	1.000	0.000	1.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	0.0	0.0	119.6	0.0	1300.7	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	0.000	0.643	0.000	0.081	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	0.0	122.2	0.0	1300.7	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	0.000	1.000	0.000	0.562	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	0.0	44.4	0.0	12.6	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	0.0	10.6	0.0	0.1	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	0.0	0.0	55.0	0.0	12.7	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	0.0	2.0	0.0	1.8	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.4	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	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	0.0	2.4	0.0	1.8	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.00	0.41	0.00	0.18	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
<b>Intersection Summary</b>								
HCM Average Control Delay	19.8							
HCM Level of Service	B							

# HCM 2010 Signalized Intersection Capacity Analysis

## 4: Commercial Driveway/Chipperfield Dr & SR 611

3/25/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	216	602	1	5	614	54	28	7	7	251	11	248
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 <sub>pbT</sub> )	1.00		1.00	1.00		1.00	1.00		0.99	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	1872	1891	1891	1890	1872	1928	1900	1900	1976	1856	1856	1947
Lanes	1	1	0	1	1	1	0	1	1	0	1	1
Lane Assignment												
Capacity, veh/h	0	1006	6	288	1003	876	86	18	94	338	25	339
Proportion Arriving On Green	0.00	0.38	0.38	0.54	0.54	0.54	0.06	0.06	0.06	0.20	0.20	0.20
Movement Delay, s/veh	0.0	0.0	22.6	24.9	17.3	10.1	43.6	0.0	40.4	56.0	0.0	44.4
Movement LOS			C	C	B	B	D		D	E		D
Approach Volume, veh/h		638			718			59			585	
Approach Delay, s/veh		22.6			16.9			43.0			50.8	
Approach LOS		C			B			D			D	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phase			2	8	4		6					
Case No			4.0	11.0	11.0		5.3					
Phase Duration (G+Y+Rc), s			53.62	11.06	24.20		53.62					
Change Period (Y+Rc), s			6.00	6.00	6.00		6.00					
Max. Allowable Headway (MAH), s			7.24	5.18	4.90		7.24					
Maximum Green Setting (Gmax), s			57.00	6.60	18.20		39.20					
Max. Queue Clearance Time (g <sub>c</sub> +l <sub>1</sub> ), s			26.55	4.21	17.61		27.54					
Green Extension Time (g <sub>e</sub> ), s			10.65	0.03	0.21		9.34					
Probability of Phase Call (p <sub>c</sub> )			1.000	0.772	1.000		1.000					
Probability of Max Out (p <sub>x</sub> )			0.598	1.000	1.000		0.907					
Left-Turn Movement Data												
Assigned Movement				3	7		1					
Mvmt. Sat Flow, veh/h				1514.49	1651.73		799.14					
Through Movement Data												
Assigned Movement			2	8	4		6					
Mvmt. Sat Flow, veh/h			1876.77	309.79	121.61		1871.78					
Right-Turn Movement Data												
Assigned Movement			12	18	14		16					
Mvmt. Sat Flow, veh/h			11.85	1656.98	1654.66		1635.38					
Left Lane Group Data												
Assigned Movement		0	0	3	7	0	1	0	0			
Lane Assignment				L+T	L+T		L					
Lanes in Group		0	0	1	1	0	1	0	0			
Group Volume (v), veh/h		0.0	0.0	46.8	320.8	0.0	11.9	0.0	0.0			
Group Sat. Flow (s), veh/h/ln		0.0	0.0	1824.3	1773.3	0.0	799.1	0.0	0.0			
Queue Serve Time (g <sub>s</sub> ), s		0.0	0.0	2.2	15.6	0.0	1.0	0.0	0.0			
Cycle Queue Clear Time (g <sub>c</sub> ), s		0.0	0.0	2.2	15.6	0.0	25.5	0.0	0.0			



# HCM 2010 Signalized Intersection Capacity Analysis

## 4: Commercial Driveway/Chipperfield Dr & SR 611

3/25/2015

Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	0.0	0.0	0.0	0.0	799.1	0.0	0.0
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	0.0	0.0	0.0	0.0	47.6	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	23.1	0.0	0.0
Perm LT Que Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
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	0.000	0.830	0.931	0.000	1.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	0.0	103.8	363.1	0.0	288.5	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	0.451	0.883	0.000	0.041	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	135.5	363.1	0.0	288.5	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	1.000	1.000	0.000	1.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	40.6	34.3	0.0	24.7	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	3.0	21.7	0.0	0.2	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	43.6	56.0	0.0	24.9	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	1.0	6.5	0.0	0.2	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.1	2.2	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	0.000	1.000	1.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	1.1	8.7	0.0	0.2	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.06	0.47	0.00	0.02	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

### Middle Lane Group Data

Assigned Movement	0	2	8	4	0	6	0	0
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	646.3	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	0.0	0.0	0.0	0.0	1871.8	0.0	0.0
Queue Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	21.8	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	21.8	0.0	0.0
Lane Group Capacity (c), veh/h	0.0	0.0	0.0	0.0	0.0	1002.9	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	0.000	0.000	0.000	0.644	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	0.0	0.0	0.0	1002.9	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	14.6	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	2.7	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	17.3	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	8.2	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.8	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	1.000	1.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	0.0	0.0	0.0	9.0	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00

# HCM 2010 Signalized Intersection Capacity Analysis

## 4: Commercial Driveway/Chipperfield Dr & SR 611



















3/25/2015

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
<b>Right Lane Group Data</b>								
Assigned Movement	0	12	18	14	0	16	0	0
Lane Assignment		T+R	R	R		R		
Lanes in Group	0	1	1	1	0	1	0	0
Group Volume (v), veh/h	0.0	637.7	12.1	263.8	0.0	59.3	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1888.6	1657.0	1654.7	0.0	1635.4	0.0	0.0
Queue Serve Time (g_s), s	0.0	24.5	0.6	13.4	0.0	1.6	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	24.5	0.6	13.4	0.0	1.6	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	0.006	1.000	1.000	0.000	1.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	1011.9	94.3	338.8	0.0	876.2	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.630	0.128	0.779	0.000	0.068	0.000	0.000
Available Capacity (c_a), veh/h	0.0	1211.2	123.0	338.8	0.0	876.2	0.0	0.0
Upstream Filter Factor (I)	0.000	0.869	1.000	1.000	0.000	1.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	20.5	39.8	33.4	0.0	9.9	0.0	0.0
Incremental Delay (d2), s/veh	0.0	2.1	0.6	11.0	0.0	0.1	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	22.6	40.4	44.4	0.0	10.1	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	11.1	0.3	5.3	0.0	0.5	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.6	0.0	1.0	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	1.000	1.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	11.6	0.3	6.4	0.0	0.5	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.18	0.07	0.80	0.00	0.06	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
<b>Intersection Summary</b>								
HCM Average Control Delay	29.4							
HCM Level of Service	C							

# HCM Signalized Intersection Capacity Analysis

## 19: 209 NB Exit Ramp/209 NB On Ramp & W Main St

















3/11/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	284	382	0	0	740	202	77	1	100	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			0.95			1.00				
Frt	1.00	1.00			0.97			0.92				
Flt Protected	0.95	1.00			1.00			0.98				
Satd. Flow (prot)	1805	1900			3494			1719				
Flt Permitted	0.21	1.00			1.00			0.98				
Satd. Flow (perm)	400	1900			3494			1719				
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	316	424	0	0	822	224	86	1	111	0	0	0
RTOR Reduction (vph)	0	0	0	0	45	0	0	71	0	0	0	0
Lane Group Flow (vph)	316	424	0	0	1001	0	0	127	0	0	0	0
Turn Type	pm+pt	NA			NA		Split	NA				
Protected Phases	7	4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)	24.0	19.0			18.0			20.0				
Effective Green, g (s)	24.0	19.0			18.0			20.0				
Actuated g/C Ratio	0.44	0.35			0.33			0.36				
Clearance Time (s)	4.0	4.0			4.0			4.0				
Vehicle Extension (s)	3.0	3.0			3.0			3.0				
Lane Grp Cap (vph)	302	656			1143			625				
v/s Ratio Prot	c0.10	0.22			0.29			c0.07				
v/s Ratio Perm	c0.36											
v/c Ratio	1.05	0.65			0.88			0.20				
Uniform Delay, d1	14.5	15.2			17.4			12.0				
Progression Factor	1.82	0.59			1.00			1.00				
Incremental Delay, d2	60.5	1.9			7.7			0.7				
Delay (s)	86.9	10.8			25.2			12.8				
Level of Service	F	B			C			B				
Approach Delay (s)		43.3			25.2			12.8			0.0	
Approach LOS		D			C			B			A	
<b>Intersection Summary</b>												
HCM Average Control Delay			30.7			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			55.0			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			77.4%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 16: 209 SB On Ramp/I-80EB / 209 SB Exit Ramp & W Main St



















3/11/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	592	10	233	584	0	0	0	0	261	1	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		0.95		1.00	1.00						1.00	
Frt		1.00		1.00	1.00						0.98	
Flt Protected		1.00		0.95	1.00						0.96	
Satd. Flow (prot)		3601		1805	1900						1784	
Flt Permitted		1.00		0.31	1.00						0.96	
Satd. Flow (perm)		3601		598	1900						1784	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	658	11	259	649	0	0	0	0	290	1	56
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	667	0	259	649	0	0	0	0	0	334	0
Turn Type		NA		pm+pt	NA					Split	NA	
Protected Phases		4		3	8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		19.0		22.0	18.0						20.0	
Effective Green, g (s)		19.0		22.0	18.0						20.0	
Actuated g/C Ratio		0.35		0.40	0.33						0.36	
Clearance Time (s)		4.0		4.0	4.0						4.0	
Vehicle Extension (s)		3.0		3.0	3.0						3.0	
Lane Grp Cap (vph)		1244		327	622						649	
v/s Ratio Prot		0.19		c0.06	c0.34						c0.19	
v/s Ratio Perm				0.26								
v/c Ratio		0.54		0.79	1.04						0.52	
Uniform Delay, d1		14.5		13.0	18.5						13.7	
Progression Factor		1.00		1.21	0.46						1.00	
Incremental Delay, d2		0.4		7.0	38.5						2.9	
Delay (s)		14.9		22.6	47.1						16.6	
Level of Service		B		C	D						B	
Approach Delay (s)		14.9			40.1			0.0			16.6	
Approach LOS		B			D			A			B	
<b>Intersection Summary</b>												
HCM Average Control Delay			27.1		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			55.0		Sum of lost time (s)			12.0				
Intersection Capacity Utilization			77.4%		ICU Level of Service				D			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM 2010 Signalized Intersection Capacity Analysis

## 22: 305 WB Exit Ramp/305 WB On Ramp & W Main St

6/17/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	20	632	0	0	463	340	0	0	0	209	209	175
Number	7	4	14	3	8	18				5	2	12
Initial Q, veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	0	0	1900	1900				1900	1900	1900
Adj Flow Rate, veh/h	22	702	0	0	514	0				232	232	0
Adj No. of Lanes	1	1	0	0	1	0				1	1	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90				0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Opposing Right Turn Influence	Yes			No						Yes		
Cap, veh/h	253	852	0	0	742	0				853	896	761
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Prop Arrive On Green	0.02	0.45	0.00	0.00	0.39	0.00				0.47	0.47	0.00
Ln Grp Delay, s/veh	19.7	26.1	0.0	0.0	26.7	0.0				16.8	16.6	0.0
Ln Grp LOS	B	C			C					B	B	
Approach Vol, veh/h		724			514						464	
Approach Delay, s/veh		25.9			26.7						16.7	
Approach LOS		C			C						B	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2		4			7	8			
Case No			9.0		4.0			1.2	8.0			
Phs Duration (G+Y+Rc), s			51.1		48.9			5.8	43.0			
Change Period (Y+Rc), s			4.0		4.0			4.0	4.0			
Max Green (Gmax), s			23.0		69.0			4.0	61.0			
Max Allow Headway (MAH), s			4.5		5.2			3.8	5.2			
Max Q Clear (g_c+I1), s			9.8		34.3			2.7	24.6			
Green Ext Time (g_e), s			1.7		10.5			0.0	10.7			
Prob of Phs Call (p_c)			1.00		1.00			0.46	1.00			
Prob of Max Out (p_x)			0.05		0.11			1.00	0.09			
Left-Turn Movement Data												
Assigned Mvmt			5					7	3			
Mvmt Sat Flow, veh/h			1810					1810	0			
Through Movement Data												
Assigned Mvmt			2		4				8			
Mvmt Sat Flow, veh/h			1900		1900				1900			
Right-Turn Movement Data												
Assigned Mvmt			12		14				18			
Mvmt Sat Flow, veh/h			1615		0				0			
Left Lane Group Data												
Assigned Mvmt		0	5	0	0	0	0	7	3			
Lane Assignment							(Pr/Pm)					
Lanes in Grp		0	1	0	0	0	0	1	0			

# HCM 2010 Signalized Intersection Capacity Analysis 22: 305 WB Exit Ramp/305 WB On Ramp & W Main St

6/17/2015

Grp Vol (v), veh/h	0	232	0	0	0	0	22	0
Grp Sat Flow (s), veh/h/ln	0	1810	0	0	0	0	1810	0
Q Serve Time (g_s), s	0.0	7.8	0.0	0.0	0.0	0.0	0.7	0.0
Cycle Q Clear Time (g_c), s	0.0	7.8	0.0	0.0	0.0	0.0	0.7	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	1810	0	0	0	0	901	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	41.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	0	853	0	0	0	0	253	0
V/C Ratio (X)	0.00	0.27	0.00	0.00	0.00	0.00	0.09	0.00
Avail Cap (c_a), veh/h	0	853	0	0	0	0	292	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	0.00	0.76	0.00
Uniform Delay (d1), s/veh	0.0	16.0	0.0	0.0	0.0	0.0	19.6	0.0
Incr Delay (d2), s/veh	0.0	0.8	0.0	0.0	0.0	0.0	0.1	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	16.8	0.0	0.0	0.0	0.0	19.7	0.0
1st-Term Q (Q1), veh/ln	0.0	3.9	0.0	0.0	0.0	0.0	0.3	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.1	0.0	0.0	0.0	0.0	0.4	0.0
%ile Storage Ratio (RQ%)	0.00	0.68	0.00	0.00	0.00	0.00	0.18	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Middle Lane Group Data</b>								
Assigned Mvmt	0	2	0	4	0	0	0	8
Lane Assignment		T		T				T
Lanes in Grp	0	1	0	1	0	0	0	1
Grp Vol (v), veh/h	0	232	0	702	0	0	0	514
Grp Sat Flow (s), veh/h/ln	0	1900	0	1900	0	0	0	1900
Q Serve Time (g_s), s	0.0	7.4	0.0	32.3	0.0	0.0	0.0	22.6
Cycle Q Clear Time (g_c), s	0.0	7.4	0.0	32.3	0.0	0.0	0.0	22.6
Lane Grp Cap (c), veh/h	0	896	0	852	0	0	0	742
V/C Ratio (X)	0.00	0.26	0.00	0.82	0.00	0.00	0.00	0.69
Avail Cap (c_a), veh/h	0	896	0	1311	0	0	0	1159
Upstream Filter (I)	0.00	1.00	0.00	0.76	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	15.9	0.0	24.1	0.0	0.0	0.0	25.5
Incr Delay (d2), s/veh	0.0	0.7	0.0	2.0	0.0	0.0	0.0	1.2
Initial Q 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	16.6	0.0	26.1	0.0	0.0	0.0	26.7
1st-Term Q (Q1), veh/ln	0.0	3.9	0.0	16.8	0.0	0.0	0.0	11.9
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.5	0.0	0.0	0.0	0.2

# HCM 2010 Signalized Intersection Capacity Analysis

## 22: 305 WB Exit Ramp/305 WB On Ramp & W Main St

6/17/2015

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.0	0.0	17.2	0.0	0.0	0.0	12.1
%ile Storage Ratio (RQ%)	0.00	0.24	0.00	0.97	0.00	0.00	0.00	1.73
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q 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 Mvmt	0	12	0	14	0	0	0	18
Lane Assignment	R							
Lanes in Grp	0	1	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	1615	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Sat Flow (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
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	761	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	761	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

### Intersection Summary

HCM 2010 Ctrl Delay	23.6
HCM 2010 LOS	C



















### Notes

User approved volume balancing among the lanes for turning movement.

# HCM 2010 Signalized Intersection Capacity Analysis

## 26: Seventh St & 307 EB Exit Ramp

3/17/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	376	0	272	0	0	0	0	157	162	129	431	0
Movement Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Queue, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj. Factor (A <sub>pbT</sub> )	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	1863	1900	1863	1900	1900	1900	1900	1909	1909	1863	1863	1900
Lanes	1	0	1	0	0	0	0	1	1	1	1	0
Lane Assignment												
Capacity, veh/h	0	0	0	0	0	0	0	1650	1403	0	1610	0
Proportion Arriving On Green	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.86	0.86	0.00	0.75	0.00
Movement Delay, s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.0	1.1	0.0
Movement LOS								A	A		A	
Approach Volume, veh/h		0			0			347			468	
Approach Delay, s/veh		0.0			0.0			0.5			1.1	
Approach LOS								A			A	
Timer:	1	2	3	4	5	6	7	8				
Assigned Phase		2				6						
Case No		7.0				4.0						
Phase Duration (G+Y+Rc), s		29.50				29.50						
Change Period (Y+Rc), s		4.00				4.00						
Max. Allowable Headway (MAH), s		5.04				5.04						
Maximum Green Setting (Gmax), s		18.70				25.50						
Max. Queue Clearance Time (g <sub>c</sub> +l <sub>1</sub> ), s		2.49				4.34						
Green Extension Time (g <sub>e</sub> ), s		4.34				4.78						
Probability of Phase Call (p <sub>c</sub> )		1.000				1.000						
Probability of Max Out (p <sub>x</sub> )		0.162				0.072						
Left-Turn Movement Data												
Assigned Movement												
Mvmt. Sat Flow, veh/h												
Through Movement Data												
Assigned Movement		2				6						
Mvmt. Sat Flow, veh/h		1909.31				1862.75						
Right-Turn Movement Data												
Assigned Movement		12				16						
Mvmt. Sat Flow, veh/h		1622.92				0.00						
Left Lane Group Data												
Assigned Movement		0	0	0	0	0	0	0	0			
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 <sub>s</sub> ), s		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Cycle Queue Clear Time (g <sub>c</sub> ), s		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			



# HCM 2010 Signalized Intersection Capacity Analysis

## 26: Seventh St & 307 EB Exit Ramp

3/17/2015

Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Que Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	25.5	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000
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	0.000	0.000	0.000	0.000	0.000	0.000	0.000
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
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	0	0	6	0	0
Lane Assignment	T		T					
Lanes in Group	0	1	0	0	0	1	0	0
Group Volume (v), veh/h	0.0	170.7	0.0	0.0	0.0	468.5	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1909.3	0.0	0.0	0.0	1862.7	0.0	0.0
Queue Serve Time (g_s), s	0.0	0.4	0.0	0.0	0.0	2.3	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	0.4	0.0	0.0	0.0	2.3	0.0	0.0
Lane Group Capacity (c), veh/h	0.0	1650.4	0.0	0.0	0.0	1610.2	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.103	0.000	0.000	0.000	0.291	0.000	0.000
Available Capacity (c_a), veh/h	0.0	1650.4	0.0	0.0	0.0	1610.2	0.0	0.0
Upstream Filter Factor (I)	0.000	1.000	0.000	0.000	0.000	0.682	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.3	0.0	0.0	0.0	0.8	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.0	0.3	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	0.4	0.0	0.0	0.0	1.1	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	-0.3	0.0	0.0	0.0	-1.3	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.1	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	0.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	-0.3	0.0	0.0	0.0	-1.2	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	-0.06	0.00	0.00	0.00	-0.10	0.00	0.00

# HCM 2010 Signalized Intersection Capacity Analysis

## 26: Seventh St & 307 EB Exit Ramp



















3/17/2015

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
<b>Right Lane Group Data</b>								
Assigned Movement	0	12	0	0	0	16	0	0
Lane Assignment	R							
Lanes in Group	0	1	0	0	0	0	0	0
Group Volume (v), veh/h	0.0	176.1	0.0	0.0	0.0	0.0	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1622.9	0.0	0.0	0.0	0.0	0.0	0.0
Queue Serve Time (g_s), s	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	0.5	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	1.000	0.000	0.000	0.000	0.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	1402.9	0.0	0.0	0.0	0.0	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.126	0.000	0.000	0.000	0.000	0.000	0.000
Available Capacity (c_a), veh/h	0.0	1402.9	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	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.2	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	0.5	0.0	0.0	0.0	0.0	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	-0.4	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	0.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	-0.3	0.0	0.0	0.0	0.0	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	-0.14	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
<b>Intersection Summary</b>								
HCM Average Control Delay	0.8							
HCM Level of Service	A							

# HCM 2010 Signalized Intersection Capacity Analysis

## 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/17/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	120	1	518	320	327	0	0	217	470
Movement Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Queue, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj. Factor (A <sub>pbT</sub> )	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	1900	1900	1900	1863	1863	1863	1872	1872	1900	1900	1863	1863
Lanes	0	0	0	0	1	1	1	1	0	0	1	1
Lane Assignment												
Capacity, veh/h	0	0	0	384	3	345	0	1191	0	0	1185	1008
Proportion Arriving On Green	0.00	0.00	0.00	0.22	0.22	0.22	0.00	0.64	0.00	0.00	0.64	0.64
Movement Delay, s/veh	0.0	0.0	0.0	18.7	0.0	178.6	0.0	5.1	0.0	0.0	4.5	7.2
Movement LOS				B		F		A			A	A
Approach Volume, veh/h		0			583			355			747	
Approach Delay, s/veh		0.0			142.5			5.1			6.4	
Approach LOS					F			A			A	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phase			2	8			6					
Case No			4.0	11.0			7.0					
Phase Duration (G+Y+Rc), s			39.00	16.00			39.00					
Change Period (Y+Rc), s			4.00	4.00			4.00					
Max. Allowable Headway (MAH), s			4.59	4.32			4.59					
Maximum Green Setting (Gmax), s			35.00	12.00			22.30					
Max. Queue Clearance Time (g <sub>c</sub> +l <sub>1</sub> ), s			6.69	14.00			11.53					
Green Extension Time (g <sub>e</sub> ), s			5.98	0.00			4.14					
Probability of Phase Call (p <sub>c</sub> )			1.000	1.000			1.000					
Probability of Max Out (p <sub>x</sub> )			0.041	1.000			0.436					
Left-Turn Movement Data												
Assigned Movement				3								
Mvmt. Sat Flow, veh/h				1760.07								
Through Movement Data												
Assigned Movement			2	8			6					
Mvmt. Sat Flow, veh/h			1872.06	14.67			1862.75					
Right-Turn Movement Data												
Assigned Movement			12	18			16					
Mvmt. Sat Flow, veh/h			0.00	1583.33			1583.33					
Left Lane Group Data												
Assigned Movement		0	0	3	0	0	0	0	0			
Lane Assignment				L+T								
Lanes in Group		0	0	1	0	0	0	0	0			
Group Volume (v), veh/h		0.0	0.0	131.5	0.0	0.0	0.0	0.0	0.0			
Group Sat. Flow (s), veh/h/ln		0.0	0.0	1774.7	0.0	0.0	0.0	0.0	0.0			
Queue Serve Time (g <sub>s</sub> ), s		0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0			
Cycle Queue Clear Time (g <sub>c</sub> ), s		0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0			

# HCM 2010 Signalized Intersection Capacity Analysis

## 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp

3/17/2015

Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Que Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	35.0	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	0.000	0.992	0.000	0.000	0.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	0.0	387.2	0.0	0.0	0.0	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	0.340	0.000	0.000	0.000	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	387.2	0.0	0.0	0.0	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	18.2	0.0	0.0	0.0	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	0.5	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	18.7	0.0	0.0	0.0	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.1	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	0.000	1.000	0.000	0.000	0.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	0.13	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

### Middle Lane Group Data

Assigned Movement	0	2	8	0	0	6	0	0
Lane Assignment	T					T		
Lanes in Group	0	1	0	0	0	1	0	0
Group Volume (v), veh/h	0.0	355.4	0.0	0.0	0.0	235.9	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1872.1	0.0	0.0	0.0	1862.7	0.0	0.0
Queue Serve Time (g_s), s	0.0	4.7	0.0	0.0	0.0	2.9	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	4.7	0.0	0.0	0.0	2.9	0.0	0.0
Lane Group Capacity (c), veh/h	0.0	1191.3	0.0	0.0	0.0	1185.4	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.298	0.000	0.000	0.000	0.199	0.000	0.000
Available Capacity (c_a), veh/h	0.0	1191.3	0.0	0.0	0.0	1185.4	0.0	0.0
Upstream Filter Factor (I)	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	4.5	0.0	0.0	0.0	4.2	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.6	0.0	0.0	0.0	0.4	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	5.1	0.0	0.0	0.0	4.5	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	1.1	0.0	0.0	0.0	0.7	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.2	0.0	0.0	0.0	0.1	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	1.000	0.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	1.3	0.0	0.0	0.0	0.8	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.18	0.00	0.00	0.00	0.15	0.00	0.00

# HCM 2010 Signalized Intersection Capacity Analysis

## 3: Broad St & 307 WB On Ramp/307 WB Exit Ramp






















3/17/2015

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
<b>Right Lane Group Data</b>								
Assigned Movement	0	12	18	0	0	16	0	0
Lane Assignment	R			R				
Lanes in Group	0	0	1	0	0	1	0	0
Group Volume (v), veh/h	0.0	0.0	451.1	0.0	0.0	510.9	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	0.0	1583.3	0.0	0.0	1583.3	0.0	0.0
Queue Serve Time (g_s), s	0.0	0.0	12.0	0.0	0.0	9.5	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	0.0	12.0	0.0	0.0	9.5	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	0.000	1.000	0.000	0.000	1.000	0.000	0.000
Lane Group Capacity (c), veh/h	0.0	0.0	345.5	0.0	0.0	1007.6	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.000	1.306	0.000	0.000	0.507	0.000	0.000
Available Capacity (c_a), veh/h	0.0	0.0	345.5	0.0	0.0	1007.6	0.0	0.0
Upstream Filter Factor (I)	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	0.0	21.5	0.0	0.0	5.4	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.0	157.1	0.0	0.0	1.8	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	178.6	0.0	0.0	7.2	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	0.0	4.0	0.0	0.0	1.8	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.0	15.1	0.0	0.0	0.5	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	1.000	0.000	0.000	1.000	0.000	0.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	19.1	0.0	0.0	2.4	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.00	9.69	0.00	0.00	1.20	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	26.4	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	0.3	0.0	0.0	0.0	0.0	0.0
<b>Intersection Summary</b>								
HCM Average Control Delay	53.2							
HCM Level of Service	D							

# HCM Signalized Intersection Capacity Analysis

## 8: Dreher Ave/School Drive & Main Street

3/26/2015



















												
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
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	14	12	11	12	14	12	14	16	14	14	12
Grade (%)		-1%			0%			1%			1%	
Total Lost time (s)	5.0	5.0		5.0	5.0	7.0	4.0	4.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.87		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1337	1646		1525	1613	1397	1483	1515		1567	1506	
Flt Permitted	0.18	1.00		0.13	1.00	1.00	0.68	1.00		0.30	1.00	
Satd. Flow (perm)	254	1646		207	1613	1397	1069	1515		500	1506	
Peak-hour factor, PHF	0.92	0.86	0.92	0.91	0.92	0.92	0.81	0.92	0.77	0.92	0.92	0.92
Adj. Flow (vph)	62	464	177	258	608	116	44	30	252	126	47	65
RTOR Reduction (vph)	0	12	0	0	0	59	0	192	0	0	45	0
Lane Group Flow (vph)	62	629	0	258	608	57	44	90	0	126	67	0
Heavy Vehicles (%)	18%	4%	14%	3%	6%	11%	9%	10%	3%	10%	10%	10%
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	24.0	24.0		39.0	39.0	39.0	24.0	24.0		24.0	24.0	
Effective Green, g (s)	26.0	26.0		41.0	41.0	39.0	26.0	26.0		24.0	24.0	
Actuated g/C Ratio	0.24	0.24		0.37	0.37	0.35	0.24	0.24		0.22	0.22	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	60	389		197	601	495	253	358		109	329	
v/s Ratio Prot		c0.38		c0.12	0.38			0.06			0.04	
v/s Ratio Perm	0.24			0.37		0.04	0.04			c0.25		
v/c Ratio	1.03	1.62		1.31	1.01	0.12	0.17	0.25		1.16	0.20	
Uniform Delay, d1	42.0	42.0		29.1	34.5	23.9	33.4	34.1		43.0	35.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	125.8	289.0		170.9	39.6	0.5	0.3	0.4		134.2	0.3	
Delay (s)	167.8	331.0		199.9	74.1	24.4	33.8	34.5		177.2	35.5	
Level of Service	F	F		F	E	C	C	C		F	D	
Approach Delay (s)		316.6			101.3			34.4			110.5	
Approach LOS		F			F			C			F	
<b>Intersection Summary</b>												
HCM Average Control Delay			159.9			HCM Level of Service				F		
HCM Volume to Capacity ratio			1.39									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)			50.0			
Intersection Capacity Utilization			87.6%			ICU Level of Service			E			
Analysis Period (min)			15									

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 9: 9th St & Main Street

3/17/2015

												
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
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	11	11	12	11	11	11	10	10	10
Grade (%)		4%			1%			5%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		0.95			1.00	1.00		1.00		1.00	1.00	
Frt		1.00			1.00	0.85		0.95		1.00	0.87	
Flt Protected		0.98			1.00	1.00		0.99		0.95	1.00	
Satd. Flow (prot)		2718			1597	1252		1495		1516	1377	
Flt Permitted		0.55			0.99	1.00		0.92		0.50	1.00	
Satd. Flow (perm)		1532			1588	1252		1390		805	1377	
Peak-hour factor, PHF	0.57	0.85	0.35	0.50	0.81	0.77	0.77	0.64	0.72	0.91	1.00	0.55
Adj. Flow (vph)	311	493	20	4	474	209	56	116	88	331	8	64
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	824	0	0	478	209	0	260	0	331	72	0
Heavy Vehicles (%)	9%	3%	0%	0%	3%	4%	2%	3%	0%	1%	13%	0%
Parking (#/hr)		0	0			0						
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)		63.5			63.5	63.5		52.0		52.0	52.0	
Effective Green, g (s)		64.0			64.0	64.0		54.0		54.0	54.0	
Actuated g/C Ratio		0.43			0.43	0.43		0.36		0.36	0.36	
Clearance Time (s)		4.5			4.5	4.5		6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		654			678	534		500		290	496	
v/s Ratio Prot											0.05	
v/s Ratio Perm		c0.54			0.30	0.17		0.19		c0.41		
v/c Ratio		1.92dl			0.71	0.39		0.52		1.14	0.15	
Uniform Delay, d1		43.0			35.3	29.6		37.8		48.0	32.4	
Progression Factor		1.00			0.70	0.73		1.00		1.00	1.00	
Incremental Delay, d2		129.1			5.6	2.0		1.0		96.6	0.1	
Delay (s)		172.1			30.2	23.7		38.8		144.6	32.5	
Level of Service		F			C	C		D		F	C	
Approach Delay (s)		172.1			28.2			38.8			124.6	
Approach LOS		F			C			D			F	

















### Intersection Summary

HCM Average Control Delay	101.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	32.0
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		
dl Defacto Left Lane. Recode with 1 though lane as a left lane.			
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 10: 8th St & Main Street/Main Street

3/17/2015

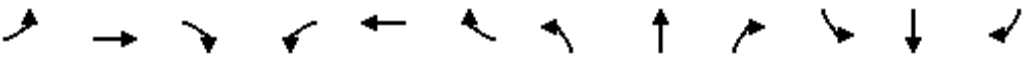
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	575	22	6	330	8	65	76	35	43	19	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	13	13	13	10	10	10	10	10	10
Grade (%)		0%			0%			1%			-1%	
Total Lost time (s)		2.5			2.5			3.5			3.5	
Lane Util. Factor		0.95			1.00			1.00			1.00	
Frt		0.99			1.00			0.97			0.93	
Flt Protected		1.00			1.00			0.98			0.98	
Satd. Flow (prot)		3502			1772			1760			1624	
Flt Permitted		0.89			0.98			0.83			0.82	
Satd. Flow (perm)		3021			1733			1405			1397	
Peak-hour factor, PHF	0.73	0.93	0.69	0.50	0.86	0.67	0.90	0.79	0.67	0.77	0.68	0.77
Adj. Flow (vph)	60	618	32	12	384	12	72	96	52	56	28	88
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	710	0	0	408	0	0	220	0	0	172	0
Heavy Vehicles (%)	7%	2%	5%	0%	1%	0%	3%	0%	3%	2%	0%	2%
Parking (#/hr)		0	0	0	0	0	0	0	0			
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		28.9			28.9			16.1			16.1	
Effective Green, g (s)		30.9			30.9			18.1			18.1	
Actuated g/C Ratio		0.41			0.41			0.24			0.24	
Clearance Time (s)		4.5			4.5			5.5			5.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1245			714			339			337	
v/s Ratio Prot												
v/s Ratio Perm		0.24			c0.24			c0.16			0.12	
v/c Ratio		0.57			0.57			0.65			0.51	
Uniform Delay, d1		16.9			17.0			25.6			24.6	
Progression Factor		0.84			1.08			1.00			1.00	
Incremental Delay, d2		0.2			0.3			4.2			1.3	
Delay (s)		14.4			18.6			29.8			25.9	
Level of Service		B			B			C			C	
Approach Delay (s)		14.4			18.6			29.8			25.9	
Approach LOS		B			B			C			C	
<b>Intersection Summary</b>												
HCM Average Control Delay			19.1			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			75.0			Sum of lost time (s)			26.0			
Intersection Capacity Utilization			63.8%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												



# HCM Signalized Intersection Capacity Analysis

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
















3/26/2015

												
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
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	13	13	13	14	14	14	11	11	11
Grade (%)		-1%			2%			4%			-1%	
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.95			1.00			1.00			1.00	
Frt		0.95			0.99			0.96			0.98	
Flt Protected		1.00			0.99			0.98			0.99	
Satd. Flow (prot)		2775			1530			1631			1447	
Flt Permitted		0.93			0.61			0.61			0.82	
Satd. Flow (perm)		2581			933			1011			1204	
Peak-hour factor, PHF	0.82	0.79	0.81	0.75	0.74	0.46	0.59	0.72	0.79	0.48	0.86	0.58
Adj. Flow (vph)	28	566	320	56	338	48	180	188	143	65	270	48
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	914	0	0	442	0	0	511	0	0	383	0
Heavy Vehicles (%)	0%	3%	1%	0%	1%	0%	4%	3%	4%	0%	1%	0%
Parking (#/hr)		0	0	0	0	0				0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		63.0			63.0			55.0			55.0	
Effective Green, g (s)		65.0			65.0			57.0			57.0	
Actuated g/C Ratio		0.43			0.43			0.38			0.38	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1118			404			384			458	
v/s Ratio Prot												
v/s Ratio Perm		0.35			c0.47			c0.51			0.32	
v/c Ratio		0.82			1.09			1.33			0.84	
Uniform Delay, d1		37.3			42.5			46.5			42.3	
Progression Factor		0.72			0.79			0.86			1.00	
Incremental Delay, d2		6.1			71.9			160.4			12.5	
Delay (s)		33.0			105.6			200.2			54.8	
Level of Service		C			F			F			D	
Approach Delay (s)		33.0			105.6			200.2			54.8	
Approach LOS		C			F			F			D	
<b>Intersection Summary</b>												
HCM Average Control Delay			88.9			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.20									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			28.0			
Intersection Capacity Utilization			95.1%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 12: Seventh St & Ann St
















3/26/2015

												
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			0.87	
Incremental Delay, d2					58.4			4.5			1.1	
Delay (s)					118.4			16.0			9.7	
Level of Service					F			B			A	
Approach Delay (s)		0.0			118.4			16.0			9.7	
Approach LOS		A			F			B			A	
<b>Intersection Summary</b>												
HCM Average Control Delay			35.6									
HCM Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			150.0									
Intersection Capacity Utilization			89.5%									
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 13: 6th St & Main Street

3/26/2015

												
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)		2663			1563			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	3	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	720	0	0	364	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)		93.4			93.4			27.6				
Effective Green, g (s)		94.4			94.4			28.6				
Actuated g/C Ratio		0.63			0.63			0.19				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		1676			984			296				
v/s Ratio Prot												
v/s Ratio Perm		0.27			0.23			0.15				
v/c Ratio		0.43			0.37			0.77				
Uniform Delay, d1		14.1			13.4			57.6				
Progression Factor		0.51			1.03			1.00				
Incremental Delay, d2		0.3			1.0			11.7				
Delay (s)		7.5			14.8			69.3				
Level of Service		A			B			E				
Approach Delay (s)		7.5			14.8			69.3			0.0	
Approach LOS		A			B			E			A	
<b>Intersection Summary</b>												
HCM Average Control Delay			20.3			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			27.0			
Intersection Capacity Utilization			47.8%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

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

3/17/2015



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		0.07	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3372		115	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	156
Lane Group Flow (vph)	701	0	319	682	96	600	226
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)	29.0		85.5	74.0	58.1	53.1	88.6
Effective Green, g (s)	31.5		85.5	76.5	63.1	55.6	88.6
Actuated g/C Ratio	0.21		0.57	0.51	0.42	0.37	0.59
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)	708		306	713	737	665	813
v/s Ratio Prot	c0.21		c0.18	0.49	0.01	0.33	
v/s Ratio Perm			c0.41		0.05		0.16
v/c Ratio	0.99		1.04	0.96	0.13	0.90	0.28
Uniform Delay, d1	59.1		49.7	35.2	26.6	44.6	15.0
Progression Factor	0.75		1.00	1.00	0.93	0.94	0.88
Incremental Delay, d2	29.8		63.0	23.3	0.1	15.5	0.2
Delay (s)	74.4		112.6	58.5	24.7	57.5	13.3
Level of Service	E		F	E	C	E	B
Approach Delay (s)	74.4					38.9	
Approach LOS	E					D	

### Intersection Summary


















HCM Average Control Delay	61.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	33.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# HCM 2010 Signalized Intersection Capacity Analysis

## 24: 5th St & Sarah St

3/17/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	82	118	2	245	209	26	85	2	18	416	102
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 <sub>pbT</sub> )	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Sat. Flow Rate, veh/h/ln	1832	1832	1832	1650	1650	1650	1590	1590	1590	1850	1850	1850
Lanes	0	1	0	0	1	1	0	1	0	0	1	0
Lane Assignment												
Capacity, veh/h	0	195	260	92	493	426	220	374	13	107	619	169
Proportion Arriving On Green	0.00	0.30	0.30	0.30	0.30	0.30	0.46	0.46	0.46	0.46	0.46	0.46
Movement Delay, s/veh	0.0	0.0	12.5	12.7	0.0	13.2	7.0	0.0	0.0	11.0	0.0	0.0
Movement LOS			B	B		B	A			B		
Approach Volume, veh/h		225			539			152			591	
Approach Delay, s/veh		12.5			12.9			7.0			11.0	
Approach LOS		B			B			A			B	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phase			2		4	5	6		8			
Case No			4.0		8.0	0.0	7.3		8.0			
Phase Duration (G+Y+Rc), s			16.39		24.41	0.00	16.39		24.41			
Change Period (Y+Rc), s			5.50		7.00	5.50	5.50		7.00			
Max. Allowable Headway (MAH), s			4.23		9.38	0.00	4.23		9.38			
Maximum Green Setting (Gmax), s			33.50		19.00	5.00	23.00		19.00			
Max. Queue Clearance Time (g <sub>c</sub> +l <sub>1</sub> ), s			7.01		12.94	0.00	8.20		4.33			
Green Extension Time (g <sub>e</sub> ), s			3.07		4.46	0.00	2.69		9.58			
Probability of Phase Call (p <sub>c</sub> )			1.000		1.000	0.000	1.000		1.000			
Probability of Max Out (p <sub>x</sub> )			0.003		1.000	0.000	0.068		0.817			
Left-Turn Movement Data												
Assigned Movement					7	5	1		3			
Mvmt. Sat Flow, veh/h					70.38	0.00	22.09		334.65			
Through Movement Data												
Assigned Movement			2		4		6		8			
Mvmt. Sat Flow, veh/h			642.93		1297.72		1610.94		695.04			
Right-Turn Movement Data												
Assigned Movement			12		14		16		18			
Mvmt. Sat Flow, veh/h			854.80		364.76		1402.63		27.80			
Left Lane Group Data												
Assigned Movement		0	0	0	7	5	1	0	3			
Lane Assignment					L+T+R		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	590.9	0.0	295.7	0.0	152.1			
Group Sat. Flow (s), veh/h/ln		0.0	0.0	0.0	1732.9	0.0	1633.0	0.0	1057.5			
Queue Serve Time (g <sub>s</sub> ), s		0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0			
Cycle Queue Clear Time (g <sub>c</sub> ), s		0.0	0.0	0.0	10.9	0.0	6.2	0.0	2.3			

# HCM 2010 Signalized Intersection Capacity Analysis

## 24: 5th St & Sarah St

3/17/2015

Perm LT Sat Flow Rate (s_l), veh/h/ln	0.0	0.0	0.0	726.3	0.0	622.7	0.0	540.6
Shared LT Sat Flow (s_sh), veh/h/ln	0.0	0.0	0.0	1849.6	0.0	1650.2	0.0	935.8
Perm LT Eff. Green (g_p), s	0.0	0.0	0.0	18.9	0.0	12.4	0.0	18.9
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	16.6	0.0	7.4	0.0	8.0
Perm LT Que Serve Time (g_ps), s	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	9.9	0.0	7.6	0.0	4.2
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	9.9	0.0	6.2	0.0	2.3
Proportion LT Inside Lane (P_L)	0.000	0.000	0.000	0.041	0.000	0.014	0.000	0.316
Lane Group Capacity (c), veh/h	0.0	0.0	0.0	894.9	0.0	585.4	0.0	606.2
Volume-to-Capacity Ratio (X)	0.000	0.000	0.000	0.660	0.000	0.505	0.000	0.251
Available Capacity (c_a), veh/h	0.0	0.0	0.0	960.4	0.0	1062.0	0.0	640.7
Upstream Filter Factor (I)	0.000	0.000	0.000	1.000	0.000	1.000	0.000	1.000
Uniform Delay (d1), s/veh	0.0	0.0	0.0	8.8	0.0	12.0	0.0	6.5
Incremental Delay (d2), s/veh	0.0	0.0	0.0	2.3	0.0	0.7	0.0	0.5
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	11.0	0.0	12.7	0.0	7.0
First-Term Queue (Q1), veh/ln	0.0	0.0	0.0	2.6	0.0	1.7	0.0	0.5
Second-Term Queue (Q2), veh/ln	0.0	0.0	0.0	0.6	0.0	0.1	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	1.000	1.000	0.000	1.000
Percentile Back of Queue (Q%), veh/ln	0.0	0.0	0.0	3.2	0.0	1.8	0.0	0.6
Percentile Storage Ratio (RQ%)	0.00	0.00	0.00	0.26	0.00	0.10	0.00	0.04
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

## 24: 5th St & Sarah St

3/17/2015

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				R			
Lanes in Group	0	1	0	0	0	1	0	0
Group Volume (v), veh/h	0.0	224.7	0.0	0.0	0.0	243.0	0.0	0.0
Group Sat. Flow (s), veh/h/ln	0.0	1497.7	0.0	0.0	0.0	1402.6	0.0	0.0
Queue Serve Time (g_s), s	0.0	5.0	0.0	0.0	0.0	6.0	0.0	0.0
Cycle Queue Clear Time (g_c), s	0.0	5.0	0.0	0.0	0.0	6.0	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	0.571	0.000	0.210	0.000	1.000	0.000	0.026
Lane Group Capacity (c), veh/h	0.0	454.9	0.0	0.0	0.0	426.0	0.0	0.0
Volume-to-Capacity Ratio (X)	0.000	0.494	0.000	0.000	0.000	0.570	0.000	0.000
Available Capacity (c_a), veh/h	0.0	1284.9	0.0	0.0	0.0	842.3	0.0	0.0
Upstream Filter Factor (I)	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.000
Uniform Delay (d1), s/veh	0.0	11.6	0.0	0.0	0.0	12.0	0.0	0.0
Incremental Delay (d2), s/veh	0.0	0.8	0.0	0.0	0.0	1.2	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	12.5	0.0	0.0	0.0	13.2	0.0	0.0
First-Term Queue (Q1), veh/ln	0.0	1.4	0.0	0.0	0.0	1.4	0.0	0.0
Second-Term Queue (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.1	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	1.5	0.0	0.0	0.0	1.5	0.0	0.0
Percentile Storage Ratio (RQ%)	0.00	0.09	0.00	0.00	0.00	0.26	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	11.5
HCM Level of Service	B

# HCM Unsignalized Intersection Capacity Analysis

55: 5th St & McConnell St

3/17/2015

						
Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Volume (veh/h)	0	0	793	113	0	536
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	862	123	0	583
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		298	357			
pX, platoon unblocked						
vC, conflicting volume	862				923	492
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	862				923	492
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	0
cM capacity (veh/h)	776				269	522
Direction, Lane #	SB 1	SB 2	SE 1			
Volume Total	575	410	583			
Volume Left	0	0	0			
Volume Right	0	123	583			
cSH	1700	1700	522			
Volume to Capacity	0.34	0.24	1.12			
Queue Length 95th (ft)	0	0	476			
Control Delay (s)	0.0	0.0	102.3			
Lane LOS			F			
Approach Delay (s)	0.0		102.3			
Approach LOS			F			
Intersection Summary						
Average Delay		38.0				
Intersection Capacity Utilization		71.9%		ICU Level of Service		C
Analysis Period (min)		15				



Intersection

Intersection Delay (sec/veh): 38.1

Movement	NBL	NBT	SBT	SBR	SEL	SER
Volume (vph)	0	0	793	113	0	536
Conflicting Peds. (#/hr)	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Right Turn Channelized	None	None	Free	Free	None	None
Storage Length	0			0	0	0
Median Width		0	0		0	
Grade (%)		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles(%)	2	2	2	2	2	2
Movement Flow Rate	0	0	862	123	0	583
Number of Lanes	0	0	2	0	0	1

Major/Minor

Major 2

Conflicting Flow Rate - All	0	0	-	492
Stage 1	0	0	-	0
Stage 2	0	0	-	0
Follow-up Headway	0	0	-	3.32
Pot Capacity-1 Maneuver	-	-	-	# 522
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Mov Capacity-1 Maneuver	-	-	-	# 522
Mov Capacity-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach

SB

SE

HCM Control Delay (s)	0	102.4
HCM LOS	A	F

Lane	SELn1	SBT	SBR
Capacity (vph)	522		
HCM Control Delay (s)	102.4	-	-
HCM Lane VC Ratio	1.116	0	-
HCM Lane LOS	F	-	-
HCM 95th Percentile Queue (veh)	19.047	0	-

# HCM Signalized Intersection Capacity Analysis

20: McConnell St & 4th St

3/17/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰			↱						↰↱	
Volume (vph)	0	90	19	122	1	0	0	0	0	142	765	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	14	14	14	12	12	12	14	14	14
Grade (%)		1%			-1%			0%			1%	
Total Lost time (s)		4.0			5.0						4.0	
Lane Util. Factor		1.00			1.00						0.95	
Frt		0.98			1.00						1.00	
Flt Protected		1.00			0.95						0.99	
Satd. Flow (prot)		862			1729						1459	
Flt Permitted		1.00			0.48						0.99	
Satd. Flow (perm)		862			872						1459	
Peak-hour factor, PHF	0.92	0.75	0.79	0.78	0.92	0.92	0.92	0.92	0.92	0.85	0.89	0.92
Adj. Flow (vph)	0	120	24	156	1	0	0	0	0	167	860	0
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	139	0	0	157	0	0	0	0	0	1027	0
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	1%	0%
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		28.1			28.1						111.9	
Effective Green, g (s)		29.1			28.1						112.9	
Actuated g/C Ratio		0.19			0.19						0.75	
Clearance Time (s)		5.0			5.0						5.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		167			163						1098	
v/s Ratio Prot		0.16										
v/s Ratio Perm					c0.18						0.70	
v/c Ratio		0.83			0.96						0.94	
Uniform Delay, d1		58.1			60.4						15.5	
Progression Factor		1.00			1.00						0.86	
Incremental Delay, d2		28.4			59.2						12.0	
Delay (s)		86.6			119.6						25.3	
Level of Service		F			F						C	
Approach Delay (s)		86.6			119.6			0.0			25.3	
Approach LOS		F			F			A			C	

## Intersection Summary


















HCM Average Control Delay	43.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 21: McConnell St & 3rd St

3/17/2015

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											 	
Volume (vph)	0	105	72	16	126	0	0	0	0	9	941	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	12	12	12	12	13	11	14
Grade (%)		1%			-2%			0%			-1%	
Total Lost time (s)		4.0			4.0						4.0	4.0
Lane Util. Factor		1.00			1.00						0.95	1.00
Frt		0.95			1.00						1.00	0.85
Flt Protected		1.00			0.99						1.00	1.00
Satd. Flow (prot)		1762			1857						1931	1558
Flt Permitted		1.00			0.87						1.00	1.00
Satd. Flow (perm)		1762			1857						1931	1558
Peak-hour factor, PHF	0.92	0.80	0.90	0.57	0.96	0.92	0.92	0.92	0.92	0.56	0.97	0.74
Adj. Flow (vph)	0	131	80	28	131	0	0	0	0	16	970	155
RTOR Reduction (vph)	0	35	0	0	0	0	0	0	0	0	0	47
Lane Group Flow (vph)	0	176	0	0	159	0	0	0	0	0	986	108
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		4			8						6	
Permitted Phases				8						6		6
Actuated Green, G (s)		13.6			13.6						51.4	51.4
Effective Green, g (s)		14.6			14.6						52.4	52.4
Actuated g/C Ratio		0.19			0.19						0.70	0.70
Clearance Time (s)		5.0			5.0						5.0	5.0
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		343			361						1349	1089
v/s Ratio Prot		c0.10										
v/s Ratio Perm					0.09						0.51	0.07
v/c Ratio		0.51			0.44						0.73	0.10
Uniform Delay, d1		27.0			26.6						7.0	3.7
Progression Factor		1.00			1.00						1.00	1.00
Incremental Delay, d2		1.3			0.9						3.5	0.2
Delay (s)		28.3			27.5						10.5	3.8
Level of Service		C			C						B	A
Approach Delay (s)		28.3			27.5			0.0			9.6	
Approach LOS		C			C			A			A	
<b>Intersection Summary</b>												
HCM Average Control Delay			14.1			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			75.0			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			58.1%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												