

HCM Signalized Intersection Capacity Analysis

1: N St SE & 1st Street SE

8/18/2006

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
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			0.95	
Frt		0.96			0.99			0.90			1.00	
Flt Protected		0.99			0.98			1.00			0.99	
Satd. Flow (prot)		1652			1674			2976			3255	
Flt Permitted		0.92			0.62			0.95			0.72	
Satd. Flow (perm)		1528			1063			2834			2365	
Volume (vph)	59	238	141	137	107	26	4	138	272	88	329	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	259	153	149	116	28	4	150	296	96	358	14
RTOR Reduction (vph)	0	17	0	0	4	0	0	195	0	0	2	0
Lane Group Flow (vph)	0	459	0	0	289	0	0	255	0	0	466	0
Turn Type	Perm		Perm		Perm		Perm		Perm		Perm	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		58.0			58.0			34.0			34.0	
Effective Green, g (s)		58.0			58.0			34.0			34.0	
Actuated g/C Ratio		0.58			0.58			0.34			0.34	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		886			617			964			804	
v/s Ratio Prot												
v/s Ratio Perm		c0.30			0.27			0.09			c0.20	
v/c Ratio		0.52			0.47			0.26			0.58	
Uniform Delay, d1		12.6			12.1			23.9			27.1	
Progression Factor		1.00			1.00			1.00			0.98	
Incremental Delay, d2		2.2			2.5			0.7			2.3	
Delay (s)		14.8			14.7			24.6			29.0	
Level of Service		B			B			C			C	
Approach Delay (s)		14.8			14.7			24.6			29.0	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay		21.3			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.54										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		75.7%			ICU Level of Service			D				
Analysis Period (min)		15										

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis 2: Potomac Avenue & Sitve Drive 2

8/18/2006

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	↑
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	500	0	0	539	24	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	543	0	0	586	26	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)	338					
pX, platoon unblocked						
vC, conflicting volume			543		836	272
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			543		836	272
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		91	98
cM capacity (veh/h)			1022		306	726
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	272	272	293	293	43	
Volume Left	0	0	0	0	26	
Volume Right	0	0	0	0	17	
cSH	1700	1700	1700	1700	398	
Volume to Capacity	0.16	0.16	0.17	0.17	0.11	
Queue Length 95th (ft)	0	0	0	0	9	
Control Delay (s)	0.0	0.0	0.0	0.0	15.2	
Lane LOS					C	
Approach Delay (s)	0.0		0.0		15.2	
Approach LOS					C	
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			24.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis 4: Potomac Avenue & South Capitol Street

8/18/2006



Movement	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations		TT	TTT	T		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		0.88	0.94	0.86		
Frt		0.85	1.00	0.85		
Flt Protected		1.00	0.95	1.00		
Satd. Flow (prot)		2601	4658	1271		
Flt Permitted		1.00	0.95	1.00		
Satd. Flow (perm)		2601	4658	1271		
Volume (vph)	0	528	4234	692	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	574	4602	752	0	0
RTOR Reduction (vph)	0	0	5	152	0	0
Lane Group Flow (vph)	0	574	4597	600	0	0
Turn Type	custom		Perm			
Protected Phases	4		2			
Permitted Phases	4		2			
Actuated Green, G (s)	17.0		91.0		91.0	
Effective Green, g (s)	19.0		93.0		93.0	
Actuated g/C Ratio	0.16		0.78		0.78	
Clearance Time (s)	6.0		6.0		6.0	
Lane Grp Cap (vph)	412		3610		985	
v/s Ratio Prot	c0.22		c0.99			
v/s Ratio Perm					0.47	
v/c Ratio	1.39		1.27		0.61	
Uniform Delay, d1	50.5		13.5		5.8	
Progression Factor	1.00		1.00		1.00	
Incremental Delay, d2	191.3		125.3		2.8	
Delay (s)	241.8		138.8		8.6	
Level of Service	F		F		A	
Approach Delay (s)	241.8		120.5		0.0	
Approach LOS	F		F		A	
Intersection Summary						
HCM Average Control Delay	132.3		HCM Level of Service		F	
HCM Volume to Capacity ratio	1.29					
Actuated Cycle Length (s)	120.0		Sum of lost time (s)		8.0	
Intersection Capacity Utilization	88.7%		ICU Level of Service		E	
Analysis Period (min)	15					
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

11: M St SW & Local S Cap SB

8/18/2006

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑		↑↑↑					↑	↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.0	3.0		3.0					3.0	3.0	
Lane Util. Factor		0.91	1.00		0.91					0.95	0.95	
Frt		1.00	0.85		1.00					1.00	0.94	
Flt Protected		1.00	1.00		1.00					0.95	0.98	
Satd. Flow (prot)		4577	1425		4556					1513	1467	
Flt Permitted		1.00	1.00		0.67					0.95	0.98	
Satd. Flow (perm)		4577	1425		3061					1513	1467	
Volume (vph)	0	1160	448	289	2842	0	0	0	0	673	84	181
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	1289	498	321	3158	0	0	0	0	748	93	201
RTOR Reduction (vph)	0	0	388	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	1289	110	0	3479	0	0	0	0	534	506	0
Turn Type		Perm D.P+P								Split		
Protected Phases		4		3	3 4					6	6	
Permitted Phases			4	4								
Actuated Green, G (s)		21.0	21.0		64.0					20.0	20.0	
Effective Green, g (s)		22.0	22.0		68.0					23.0	23.0	
Actuated g/C Ratio		0.22	0.22		0.68					0.23	0.23	
Clearance Time (s)		4.0	4.0							6.0	6.0	
Lane Grp Cap (vph)		1007	314		2769					348	337	
v/s Ratio Prot		c0.28			c0.58					c0.35	0.34	
v/s Ratio Perm			0.08		0.28							
v/c Ratio		1.28	0.35		1.26					1.53	1.50	
Uniform Delay, d1		39.0	32.9		16.0					38.5	38.5	
Progression Factor		1.00	1.00		0.56					1.00	1.00	
Incremental Delay, d2		133.7	3.0		115.7					254.5	240.3	
Delay (s)		172.7	36.0		124.6					293.0	278.8	
Level of Service		F	D		F					F	F	
Approach Delay (s)		134.6			124.6			0.0			286.1	
Approach LOS		F			F			A			F	
Intersection Summary												
HCM Average Control Delay		154.1				HCM Level of Service		F				
HCM Volume to Capacity ratio		1.33										
Actuated Cycle Length (s)		100.0				Sum of lost time (s)		9.0				
Intersection Capacity Utilization		137.6%				ICU Level of Service		H				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

12: M St SE & Local S Cap NB

8/18/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↑		↑	↑				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.0			3.0		3.0	3.0				
Lane Util. Factor		0.91			0.91		*0.95	0.95				
Frt		1.00			0.99		1.00	0.99				
Flt Protected		1.00			1.00		0.95	0.96				
Satd. Flow (prot)		4559			4536		1513	1507				
Flt Permitted		0.66			1.00		0.95	0.96				
Satd. Flow (perm)		3031			4536		1513	1507				
Volume (vph)	141	1691	0	0	1044	66	2087	38	88	0	0	0
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)	157	1879	0	0	1160	73	2319	42	98	0	0	0
RTOR Reduction (vph)	0	0	0	0	7	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	2036	0	0	1226	0	1263	1193	0	0	0	0
Turn Type	D.P+P						Split					
Protected Phases	7	5	7		5		2	2				
Permitted Phases	5											
Actuated Green, G (s)		41.0			21.0		43.0	43.0				
Effective Green, g (s)		45.0			22.0		46.0	46.0				
Actuated g/C Ratio		0.45			0.22		0.46	0.46				
Clearance Time (s)					4.0		6.0	6.0				
Lane Grp Cap (vph)		1715			998		696	693				
v/s Ratio Prot		c0.27			c0.27		c0.83	0.79				
v/s Ratio Perm		0.26										
v/c Ratio		1.19			1.23		1.81	1.72				
Uniform Delay, d1		27.5			39.0		27.0	27.0				
Progression Factor		0.27			0.94		1.00	1.00				
Incremental Delay, d2		84.8			109.7		372.3	330.6				
Delay (s)		92.2			146.3		399.3	357.6				
Level of Service		F			F		F	F				
Approach Delay (s)		92.2			146.3		379.0				0.0	
Approach LOS		F			F		F				A	
Intersection Summary												
HCM Average Control Delay		227.0					HCM Level of Service	F				
HCM Volume to Capacity ratio		1.51										
Actuated Cycle Length (s)		100.0					Sum of lost time (s)	9.0				
Intersection Capacity Utilization		141.8%					ICU Level of Service	H				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

13: M St SE & 1st Street SE

8/18/2006

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔↔			↔↔↔			↔↔			↔↔	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.91			0.91			0.95			0.95	
Frt		0.98			0.99			0.94			0.95	
Flt Protected		1.00			0.99			0.98			0.99	
Satd. Flow (prot)		4480			4506			2821			2781	
Flt Permitted		0.88			0.65			0.79			0.87	
Satd. Flow (perm)		3966			2963			2286			2434	
Volume (vph)	23	1252	200	258	1011	51	82	34	77	22	43	28
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)	26	1391	222	287	1123	57	91	38	86	24	48	31
RTOR Reduction (vph)	0	21	0	0	4	0	0	65	0	0	23	0
Lane Group Flow (vph)	0	1618	0	0	1463	0	0	151	0	0	80	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	6%	6%	6%	2%	2%	2%
Parking (#/hr)										10	10	10
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	4 3			2			6	
Permitted Phases	4			4 3			2			6		
Actuated Green, G (s)		52.0			62.0			22.0			22.0	
Effective Green, g (s)		55.0			66.0			25.0			25.0	
Actuated g/C Ratio		0.55			0.66			0.25			0.25	
Clearance Time (s)		6.0						6.0			6.0	
Lane Grp Cap (vph)		2181			2125			572			609	
v/s Ratio Prot					c0.08							
v/s Ratio Perm		c0.41			0.38			c0.07			0.03	
v/c Ratio		0.74			1.09dl			0.26			0.13	
Uniform Delay, d1		17.1			10.6			30.1			29.1	
Progression Factor		0.79			1.00			0.87			1.00	
Incremental Delay, d2		0.2			1.8			1.0			0.4	
Delay (s)		13.8			12.4			27.2			29.5	
Level of Service		B			B			C			C	
Approach Delay (s)		13.8			12.4			27.2			29.5	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay			14.5			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			100.0		Sum of lost time (s)			9.0				
Intersection Capacity Utilization			82.8%		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 Unsignalized Intersection Capacity Analysis
16: Potomac Avenue & Site Drive 1

8/18/2006

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖	↗
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	392	123	122	486	53	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	426	134	133	528	58	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh						
Upstream signal (ft)	499			1259		
pX, platoon unblocked						
vC, conflicting volume			560		1022	280
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			560		1022	280
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			87		71	97
cM capacity (veh/h)			1007		201	717
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	284	276	309	352	80	
Volume Left	0	0	133	0	58	
Volume Right	0	134	0	0	23	
cSH	1700	1700	1007	1700	253	
Volume to Capacity	0.17	0.16	0.13	0.21	0.32	
Queue Length 95th (ft)	0	0	11	0	33	
Control Delay (s)	0.0	0.0	4.7	0.0	25.7	
Lane LOS			A		D	
Approach Delay (s)	0.0		2.2		25.7	
Approach LOS					D	
Intersection Summary						
Average Delay			2.7			
Intersection Capacity Utilization			46.0%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
18: Potomac Avenue & Site Drive 3

8/18/2006

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↗
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	495	158	0	562	0	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	538	172	0	611	0	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)	151					
pX, platoon unblocked						
vC, conflicting volume			710		929	355
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			710		929	355
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	99
cM capacity (veh/h)			885		266	641
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	359	351	305	305	4	
Volume Left	0	0	0	0	0	
Volume Right	0	172	0	0	4	
cSH	1700	1700	1700	1700	641	
Volume to Capacity	0.21	0.21	0.18	0.18	0.01	
Queue Length 95th (ft)	0	0	0	0	1	
Control Delay (s)	0.0	0.0	0.0	0.0	10.7	
Lane LOS					B	
Approach Delay (s)	0.0		0.0		10.7	
Approach LOS					B	
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			28.7%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 20: Site Drive 4 & South Capitol Street

8/18/2006

								
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Sign Control	Stop		Free			Free		
Grade	0%		0%			0%		
Volume (veh/h)	0	0	4495	52	0	0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	0	0	4886	57	0	0		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type	None							
Median storage (veh)								
Upstream signal (ft)	174							
pX, platoon unblocked								
vC, conflicting volume	4914	1250			4942			
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	4914	1250			4942			
tC, single (s)	6.8	6.9			4.1			
tC, 2 stage (s)								
tF (s)	3.5	3.3			2.2			
p0 queue free %	100	100			100			
cM capacity (veh/h)	0	164			18			
Direction, Lane #	NB 1	NB 2	NB 3	NB 4				
Volume Total	1396	1396	1396	755				
Volume Left	0	0	0	0				
Volume Right	0	0	0	57				
cSH	1700	1700	1700	1700				
Volume to Capacity	0.82	0.82	0.82	0.44				
Queue Length 95th (ft)	0	0	0	0				
Control Delay (s)	0.0	0.0	0.0	0.0				
Lane LOS								
Approach Delay (s)	0.0							
Approach LOS								
Intersection Summary								
Average Delay	0.0							
Intersection Capacity Utilization	69.3%							
ICU Level of Service	C							
Analysis Period (min)	15							

HCM Signalized Intersection Capacity Analysis

1: N St SE & 1st Street SE

8/18/2006

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
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			0.95	
Frt		0.98			0.99			0.94			0.99	
Flt Protected		1.00			0.97			1.00			1.00	
Satd. Flow (prot)		1699			1674			3097			3276	
Flt Permitted		0.95			0.75			0.95			0.93	
Satd. Flow (perm)		1627			1282			2957			3040	
Volume (vph)	12	129	23	311	239	55	1	233	166	6	95	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	140	25	338	260	60	1	253	180	7	103	4
RTOR Reduction (vph)	0	6	0	0	4	0	0	130	0	0	2	0
Lane Group Flow (vph)	0	172	0	0	654	0	0	304	0	0	112	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		74.0			74.0			18.0			18.0	
Effective Green, g (s)		74.0			74.0			18.0			18.0	
Actuated g/C Ratio		0.74			0.74			0.18			0.18	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		1204			949			532			547	
v/s Ratio Prot												
v/s Ratio Perm		0.11			0.51			0.10			0.04	
v/c Ratio		0.14			0.69			0.57			0.20	
Uniform Delay, d1		3.8			6.9			37.5			34.9	
Progression Factor		1.00			1.00			1.00			1.34	
Incremental Delay, d2		0.2			4.1			4.4			0.7	
Delay (s)		4.0			11.0			41.9			47.6	
Level of Service		A			B			D			D	
Approach Delay (s)		4.0			11.0			41.9			47.6	
Approach LOS		A			B			D			D	
Intersection Summary												
HCM Average Control Delay		22.8										
HCM Volume to Capacity ratio		0.67										
Actuated Cycle Length (s)		100.0										
Intersection Capacity Utilization		64.5%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 2: Potomac Avenue & Site Drive 3

8/18/2006

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	311	29	0	562	0	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	338	32	0	611	0	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)	155					
pX, platoon unblocked						
vC, conflicting volume			370		659	185
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			370		659	185
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	96
cM capacity (veh/h)			1186		397	826
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	225	144	305	305	33	
Volume Left	0	0	0	0	0	
Volume Right	0	32	0	0	33	
cSH	1700	1700	1700	1700	826	
Volume to Capacity	0.13	0.08	0.18	0.18	0.04	
Queue Length 95th (ft)	0	0	0	0	3	
Control Delay (s)	0.0	0.0	0.0	0.0	9.5	
Lane LOS					A	
Approach Delay (s)	0.0		0.0		9.5	
Approach LOS					A	
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			19.5%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
4: Potomac Avenue & South Capitol Street

8/18/2006

						
Movement	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations		↑↑	↑↑↑	↑		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		0.88	0.94	0.86		
Frt		0.85	1.00	0.85		
Flt Protected		1.00	0.95	1.00		
Satd. Flow (prot)		2601	4658	1271		
Flt Permitted		1.00	0.95	1.00		
Satd. Flow (perm)		2601	4658	1271		
Volume (vph)	0	750	2875	347	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	815	3125	377	0	0
RTOR Reduction (vph)	0	3	8	112	0	0
Lane Group Flow (vph)	0	812	3118	265	0	0
Turn Type	custom		Perm			
Protected Phases	4		2			
Permitted Phases	4		2			
Actuated Green, G (s)	28.0		82.0			
Effective Green, g (s)	28.0		84.0			
Actuated g/C Ratio	0.23		0.70			
Clearance Time (s)	4.0		6.0			
Lane Grp Cap (vph)	607		890			
v/s Ratio Prot	c0.31		c0.67			
v/s Ratio Perm			0.21			
v/c Ratio	1.34		0.30			
Uniform Delay, d1	46.0		6.8			
Progression Factor	1.00		1.00			
Incremental Delay, d2	162.9		0.9			
Delay (s)	208.9		7.7			
Level of Service	F		A			
Approach Delay (s)	208.9		22.9		0.0	
Approach LOS	F		C		A	
Intersection Summary						
HCM Average Control Delay	58.0		HCM Level of Service		E	
HCM Volume to Capacity ratio	1.05					
Actuated Cycle Length (s)	120.0		Sum of lost time (s)		8.0	
Intersection Capacity Utilization	60.4%		ICU Level of Service		B	
Analysis Period (min)	15					
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis 11: M St SW & Local S Cap SB

8/18/2006

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑		↑↑↑					↑	↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.0	3.0		3.0					3.0	3.0	
Lane Util. Factor		0.91	1.00		0.91					0.95	0.95	
Frt		1.00	0.85		1.00					1.00	0.94	
Flt Protected		1.00	1.00		1.00					0.95	1.00	
Satd. Flow (prot)		4577	1425		4558					1513	1490	
Flt Permitted		1.00	1.00		0.65					0.95	1.00	
Satd. Flow (perm)		4577	1425		2959					1513	1490	
Volume (vph)	0	1387	1571	180	2032	0	0	0	0	403	232	176
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	1541	1746	200	2258	0	0	0	0	448	258	196
RTOR Reduction (vph)	0	0	343	0	0	0	0	0	0	0	17	0
Lane Group Flow (vph)	0	1541	1403	0	2458	0	0	0	0	448	437	0
Turn Type		Perm D.P+P								Split		
Protected Phases		4		3	3 4					6	6	
Permitted Phases			4	4								
Actuated Green, G (s)		34.0	34.0		66.0					18.0	18.0	
Effective Green, g (s)		35.0	35.0		70.0					21.0	21.0	
Actuated g/C Ratio		0.35	0.35		0.70					0.21	0.21	
Clearance Time (s)		4.0	4.0							6.0	6.0	
Lane Grp Cap (vph)		1602	499		2631					318	313	
v/s Ratio Prot		0.34			c0.33					c0.30	0.29	
v/s Ratio Perm			c0.98		0.33							
v/c Ratio		0.96	2.81		0.93					1.41	1.40	
Uniform Delay, d1		31.8	32.5		13.0					39.5	39.5	
Progression Factor		1.00	1.00		1.24					1.00	1.00	
Incremental Delay, d2		15.1	820.6		0.9					201.7	197.2	
Delay (s)		46.9	853.1		17.0					241.2	236.7	
Level of Service		D	F		B					F	F	
Approach Delay (s)		475.2			17.0			0.0			239.0	
Approach LOS		F			B			A			F	
Intersection Summary												
HCM Average Control Delay		273.7				HCM Level of Service		F				
HCM Volume to Capacity ratio		1.77										
Actuated Cycle Length (s)		100.0				Sum of lost time (s)		9.0				
Intersection Capacity Utilization		190.9%				ICU Level of Service		H				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 12: M St SE & Local S Cap NB

8/18/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↑		↑	↑				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.0			3.0		3.0	3.0				
Lane Util. Factor		0.91			0.91		*0.95	0.95				
Frt		1.00			0.97		1.00	0.98				
Flt Protected		0.99			1.00		0.95	0.98				
Satd. Flow (prot)		4546			4443		1513	1533				
Flt Permitted		0.67			1.00		0.95	0.98				
Satd. Flow (perm)		3070			4443		1513	1533				
Volume (vph)	242	1551	0	0	1350	327	862	306	77	0	0	0
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)	269	1723	0	0	1500	363	958	340	86	0	0	0
RTOR Reduction (vph)	0	0	0	0	41	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	1992	0	0	1822	0	682	697	0	0	0	0
Turn Type	D.P+P						Split					
Protected Phases	7	5 7			5		2	2				
Permitted Phases	5											
Actuated Green, G (s)		52.0			34.0		32.0	32.0				
Effective Green, g (s)		56.0			35.0		35.0	35.0				
Actuated g/C Ratio		0.56			0.35		0.35	0.35				
Clearance Time (s)					4.0		6.0	6.0				
Lane Grp Cap (vph)		2029			1555		530	537				
v/s Ratio Prot		c0.21			c0.41		0.45	c0.45				
v/s Ratio Perm		0.34										
v/c Ratio		0.98			1.17		1.29	1.30				
Uniform Delay, d1		21.5			32.5		32.5	32.5				
Progression Factor		0.36			0.81		1.00	1.00				
Incremental Delay, d2		3.1			83.6		142.8	147.2				
Delay (s)		10.9			109.8		175.3	179.7				
Level of Service		B			F		F	F				
Approach Delay (s)		10.9			109.8		177.5				0.0	
Approach LOS		B			F		F				A	
Intersection Summary												
HCM Average Control Delay		90.1			HCM Level of Service		F					
HCM Volume to Capacity ratio		1.18										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)		9.0					
Intersection Capacity Utilization		123.9%			ICU Level of Service		H					
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
13: M St SE & 1st Street SE

8/18/2006

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔↔			↔↔↔			↔↔			↔↔		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	3.0			3.0			3.0			3.0		
Lane Util. Factor	0.91			0.91			0.95			0.95		
Frt	0.99			1.00			0.92			0.94		
Flt Protected	1.00			1.00			0.98			0.98		
Satd. Flow (prot)	4547			4555			2766			2701		
Flt Permitted	0.88			0.81			0.81			0.79		
Satd. Flow (perm)	4002			3694			2273			2182		
Volume (vph)	23	1379	55	46	1322	29	125	21	163	24	10	26
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)	26	1532	61	51	1469	32	139	23	181	27	11	29
RTOR Reduction (vph)	0	4	0	0	2	0	0	136	0	0	22	0
Lane Group Flow (vph)	0	1615	0	0	1550	0	0	207	0	0	45	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	6%	6%	6%	2%	2%	2%
Parking (#/hr)										10	10	10
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases	4			3			2			6		
Permitted Phases	4			4 3			2			6		
Actuated Green, G (s)	52.0			62.0			22.0			22.0		
Effective Green, g (s)	55.0			66.0			25.0			25.0		
Actuated g/C Ratio	0.55			0.66			0.25			0.25		
Clearance Time (s)	6.0						6.0			6.0		
Lane Grp Cap (vph)	2201			2533			568			546		
v/s Ratio Prot				c0.07								
v/s Ratio Perm	c0.40			0.34			c0.09			0.02		
v/c Ratio	0.73			0.61			0.36			0.08		
Uniform Delay, d1	17.0			9.7			30.9			28.7		
Progression Factor	1.15			1.00			1.30			1.00		
Incremental Delay, d2	0.5			1.1			1.4			0.3		
Delay (s)	20.1			10.8			41.7			29.0		
Level of Service	C			B			D			C		
Approach Delay (s)	20.1			10.8			41.7			29.0		
Approach LOS	C			B			D			C		
Intersection Summary												
HCM Average Control Delay	18.3			HCM Level of Service			B					
HCM Volume to Capacity ratio	0.62											
Actuated Cycle Length (s)	100.0			Sum of lost time (s)			9.0					
Intersection Capacity Utilization	88.8%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
16: Potomac Avenue & Sitve Drive 2

8/18/2006

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘↙	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	341	0	0	613	27	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	371	0	0	666	29	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)	307					
pX, platoon unblocked						
vC, conflicting volume			371		704	185
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			371		704	185
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		92	98
cM capacity (veh/h)			1184		371	825
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	185	185	333	333	49	
Volume Left	0	0	0	0	29	
Volume Right	0	0	0	0	20	
cSH	1700	1700	1700	1700	476	
Volume to Capacity	0.11	0.11	0.20	0.20	0.10	
Queue Length 95th (ft)	0	0	0	0	9	
Control Delay (s)	0.0	0.0	0.0	0.0	13.4	
Lane LOS					B	
Approach Delay (s)	0.0		0.0		13.4	
Approach LOS					B	
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			26.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
18: Potomac Avenue & Sitve Drive 1

8/18/2006

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖	↗
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	317	41	34	359	254	82
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	345	45	37	390	276	89
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)	485			1268		
pX, platoon unblocked						
vC, conflicting volume			389		636	195
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			389		636	195
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		31	89
cM capacity (veh/h)			1166		397	814
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	230	159	167	260	365	
Volume Left	0	0	37	0	276	
Volume Right	0	45	0	0	89	
cSH	1700	1700	1166	1700	454	
Volume to Capacity	0.14	0.09	0.03	0.15	0.80	
Queue Length 95th (ft)	0	0	2	0	185	
Control Delay (s)	0.0	0.0	2.0	0.0	38.3	
Lane LOS			A		E	
Approach Delay (s)	0.0		0.8		38.3	
Approach LOS					E	
Intersection Summary						
Average Delay			12.1			
Intersection Capacity Utilization			50.1%		ICU Level of Service	A
Analysis Period (min)			15			