

APPENDIX F

2013 Future Background Capacity Analyses

HCM Signalized Intersection Capacity Analysis 1: New York Ave. & 16th Street

3011 Abdo New York Avenue
4/20/2006

												
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	11	11	11	11	11	11	10	10	10	13	13	13
Total Lost time (s)	3.0			3.0			3.0			3.0		
Lane Util. Factor	0.91			0.91			1.00			1.00		
Frbp, ped/bikes	1.00			1.00			1.00			1.00		
Flpb, ped/bikes	1.00			1.00			1.00			1.00		
Frt	1.00			1.00			0.94			0.97		
Flt Protected	1.00			1.00			0.99			0.98		
Satd. Flow (prot)	4902			4914			1621			1831		
Flt Permitted	1.00			0.92			0.97			0.89		
Satd. Flow (perm)	4902			4504			1577			1655		
Volume (vph)	0	1459	23	18	3098	3	3	11	12	2	2	1
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	1621	26	20	3442	3	3	12	13	2	2	1
RTOR Reduction (vph)	0	1	0	0	0	0	0	12	0	0	1	0
Lane Group Flow (vph)	0	1646	0	0	3465	0	0	16	0	0	4	0
Confl. Peds. (#/hr)	3			3			1			1		
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases	2			2			4			4		
Permitted Phases	2			2			4			4		
Actuated Green, G (s)	83.6			83.6			5.4			5.4		
Effective Green, g (s)	85.6			85.6			8.4			8.4		
Actuated g/C Ratio	0.86			0.86			0.08			0.08		
Clearance Time (s)	5.0			5.0			6.0			6.0		
Vehicle Extension (s)	3.0			3.0			3.0			3.0		
Lane Grp Cap (vph)	4196			3855			132			139		
v/s Ratio Prot	0.34											
v/s Ratio Perm				c0.77			c0.01			0.00		
v/c Ratio	0.39			0.90			0.12			0.03		
Uniform Delay, d1	1.6			4.5			42.4			42.1		
Progression Factor	1.00			0.64			1.00			1.00		
Incremental Delay, d2	0.3			0.4			0.4			0.1		
Delay (s)	1.8			3.2			42.8			42.1		
Level of Service	A			A			D			D		
Approach Delay (s)	1.8			3.2			42.8			42.1		
Approach LOS	A			A			D			D		
Intersection Summary												
HCM Average Control Delay	3.0			HCM Level of Service			A					
HCM Volume to Capacity ratio	0.83											
Actuated Cycle Length (s)	100.0			Sum of lost time (s)			6.0					
Intersection Capacity Utilization	86.7%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
2: New York Ave. & Bladensburg Rd.

3011 Abdo New York Avenue

4/20/2006

												
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	10	11	11	10	11	11	11	11	11	10	10	10
Total Lost time (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Util. Factor	0.97	0.91		0.97	0.91			0.91	0.91		0.91	0.91
Fr _t	1.00	1.00		1.00	1.00			1.00	0.85		0.98	0.85
Fl _t Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (prot)	3204	4896		3204	4910			3277	1393		3103	1345
Fl _t Permitted	0.95	1.00		0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	3204	4896		3204	4910			3277	1393		3103	1345
Volume (vph)	227	1402	39	551	2934	24	0	376	205	0	614	529
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)	252	1558	43	612	3260	27	0	418	228	0	682	588
RTOR Reduction (vph)	0	3	0	0	1	0	0	0	0	0	11	0
Lane Group Flow (vph)	252	1598	0	612	3286	0	0	418	228	0	772	487
Turn Type	Prot			Prot				pm+ov			pm+ov	
Protected Phases	5	2 5		1	6			4	1		8	5
Permitted Phases									4			8
Actuated Green, G (s)	7.0	32.0		30.0	54.0			21.0	51.0		21.0	28.0
Effective Green, g (s)	9.0	33.0		33.0	57.0			25.0	58.0		25.0	34.0
Actuated g/C Ratio	0.09	0.33		0.33	0.57			0.25	0.58		0.25	0.34
Clearance Time (s)	5.0			6.0	6.0			7.0	6.0		7.0	5.0
Lane Grp Cap (vph)	288	1616		1057	2799			819	850		776	498
v/s Ratio Prot	0.08	0.33		0.19	c0.67			0.13	0.09		0.25	c0.09
v/s Ratio Perm									0.08			0.27
v/c Ratio	0.88	0.99		0.58	1.17			0.51	0.27		0.99	0.98
Uniform Delay, d ₁	44.9	33.3		27.7	21.5			32.2	10.4		37.4	32.6
Progression Factor	0.82	0.60		1.00	1.00			1.38	1.64		0.54	0.41
Incremental Delay, d ₂	26.2	18.5		2.3	82.4			2.2	0.8		27.8	31.3
Delay (s)	62.9	38.7		30.1	103.9			46.7	17.9		48.0	44.7
Level of Service	E	D		C	F			D	B		D	D
Approach Delay (s)		42.0			92.3			36.5			46.8	
Approach LOS		D			F			D			D	
Intersection Summary												
HCM Average Control Delay		67.9						HCM Level of Service		E		
HCM Volume to Capacity ratio		1.10										
Actuated Cycle Length (s)		100.0						Sum of lost time (s)		6.0		
Intersection Capacity Utilization		96.3%						ICU Level of Service		F		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: Mt. Olivet Rd. & West Virginia Ave.

3011 Abdo New York Avenue
4/20/2006

												
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	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)		3.0			3.0			3.0		3.0	3.0	
Lane Util. Factor		0.95			0.95			0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	
Frt		0.99			0.98			0.98		1.00	1.00	
Flt Protected		0.99			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		3230			3168			3051		1649	3134	
Flt Permitted		0.69			0.84			0.53		0.47	1.00	
Satd. Flow (perm)		2230			2658			1629		815	3134	
Volume (vph)	53	400	44	62	675	98	62	226	36	130	464	4
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)	59	444	49	69	750	109	69	251	40	144	516	4
RTOR Reduction (vph)	0	7	0	0	10	0	0	10	0	0	0	0
Lane Group Flow (vph)	0	545	0	0	918	0	0	350	0	144	520	0
Confl. Peds. (#/hr)	20		35	35		20			6	6		
Bus Blockages (#/hr)	0	0	0	0	8	8	0	0	0	0	0	0
Parking (#/hr)								0	0		0	0
Turn Type	Perm		Perm		Perm		custom					
Protected Phases		4			8			2		1	6	1
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		38.0			38.0			34.0		47.0	52.0	
Effective Green, g (s)		40.0			40.0			36.0		51.0	54.0	
Actuated g/C Ratio		0.40			0.40			0.36		0.51	0.54	
Clearance Time (s)		5.0			5.0			5.0		5.0		
Lane Grp Cap (vph)		892			1063			586		541	1692	
v/s Ratio Prot										0.04	c0.17	
v/s Ratio Perm		0.24			c0.35			c0.22		0.10		
v/c Ratio		0.61			0.86			0.96dl		0.27	0.31	
Uniform Delay, d1		23.8			27.5			26.1		13.3	12.7	
Progression Factor		1.00			1.00			1.00		1.06	1.21	
Incremental Delay, d2		3.1			9.3			4.5		1.0	0.4	
Delay (s)		26.9			36.8			30.6		15.1	15.7	
Level of Service		C			D			C		B	B	
Approach Delay (s)		26.9			36.8			30.6			15.5	
Approach LOS		C			D			C			B	
Intersection Summary												
HCM Average Control Delay		28.1										
HCM Volume to Capacity ratio		0.67										
Actuated Cycle Length (s)		100.0								9.0		
Intersection Capacity Utilization		118.0%										
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
4: Montana Ave. & 17th Street

3011 Abdo New York Avenue
4/20/2006

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	2	112	12	224	215	2	3	1	34	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
Hourly flow rate (vph)	2	124	13	249	239	2	3	1	38	0	0	0
Pedestrians	10											
Lane Width (ft)	10.0											
Walking Speed (ft/s)	4.0											
Percent Blockage	1											
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (ft)	850											
pX, platoon unblocked												
vC, conflicting volume	241			148			883	884	141	912	890	240
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	241			148			883	884	141	912	890	240
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			83			99	100	96	100	100	100
cM capacity (veh/h)	1325			1424			227	232	900	209	231	799
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	140	490	42	0								
Volume Left	2	249	3	0								
Volume Right	13	2	38	0								
cSH	1325	1424	688	1700								
Volume to Capacity	0.00	0.17	0.06	0.00								
Queue Length 95th (ft)	0	16	5	0								
Control Delay (s)	0.1	4.9	10.6	0.0								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.1	4.9	10.6	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay	4.3											
Intersection Capacity Utilization	45.8%				ICU Level of Service				A			
Analysis Period (min)	15											



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	11	11	11	10	10	10	11	11	11	11	11	11
Total Lost time (s)		3.0	3.0		3.0			3.0			3.0	
Lane Util. Factor		1.00	1.00		1.00			0.91			0.91	
Frpb, ped/bikes		1.00	0.98		1.00			1.00			0.99	
Flpb, ped/bikes		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.99			1.00			0.97	
Flt Protected		0.96	1.00		0.98			0.99			1.00	
Satd. Flow (prot)		1720	1356		1498			4819			4753	
Flt Permitted		0.78	1.00		0.87			0.66			0.94	
Satd. Flow (perm)		1399	1356		1334			3213			4461	
Volume (vph)	31	4	102	34	30	5	146	551	6	3	1071	248
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)	34	4	113	38	33	6	162	612	7	3	1190	276
RTOR Reduction (vph)	0	0	82	0	3	0	0	1	0	0	38	0
Lane Group Flow (vph)	0	38	31	0	74	0	0	780	0	0	1431	0
Confl. Peds. (#/hr)	2		3	3		2	5		1	1		5
Bus Blockages (#/hr)	0	0	0	0	0	0	0	6	6	0	0	0
Parking (#/hr)			0	1	1	1						
Turn Type	Perm		Perm	Perm		pm+pt				Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		24.0	24.0		24.0			64.0			35.0	
Effective Green, g (s)		27.0	27.0		27.0			67.0			38.0	
Actuated g/C Ratio		0.27	0.27		0.27			0.67			0.38	
Clearance Time (s)		6.0	6.0		6.0			6.0			6.0	
Lane Grp Cap (vph)		378	366		360			2570			1695	
v/s Ratio Prot								c0.08				
v/s Ratio Perm		0.03	0.02		c0.06			0.12			c0.32	
v/c Ratio		0.10	0.08		0.21			0.30			0.84	
Uniform Delay, d1		27.4	27.3		28.2			6.8			28.3	
Progression Factor		1.13	2.00		1.00			1.00			0.59	
Incremental Delay, d2		0.5	0.4		1.3			0.3			3.6	
Delay (s)		31.5	54.9		29.5			7.1			20.3	
Level of Service		C	D		C			A			C	
Approach Delay (s)		49.0			29.5			7.1			20.3	
Approach LOS		D			C			A			C	

Intersection Summary

HCM Average Control Delay	18.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

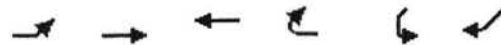
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: Queens Chapel Rd. & Bladensburg Rd.

3011 Abdo New York Avenue
4/20/2006



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↑↑↑	↑↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	10	10	10	10
Total Lost time (s)	3.0			3.0	3.0	
Lane Util. Factor	1.00			0.91	0.91	
Frt	0.93			1.00	0.97	
Flt Protected	0.98			0.99	1.00	
Satd. Flow (prot)	1636			4691	4609	
Flt Permitted	0.98			0.66	1.00	
Satd. Flow (perm)	1636			3111	4609	
Volume (vph)	118	124	161	525	915	219
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	131	138	179	583	1017	243
RTOR Reduction (vph)	38	0	0	0	40	0
Lane Group Flow (vph)	231	0	0	762	1220	0
Turn Type			pm+pt			
Protected Phases	4		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	21.0			68.0	40.0	
Effective Green, g (s)	24.0			70.0	41.0	
Actuated g/C Ratio	0.24			0.70	0.41	
Clearance Time (s)	6.0			5.0	4.0	
Lane Grp Cap (vph)	393			2589	1890	
v/s Ratio Prot	c0.14			c0.08	c0.26	
v/s Ratio Perm				0.13		
v/c Ratio	0.59			0.29	0.65	
Uniform Delay, d1	33.6			5.7	23.7	
Progression Factor	1.00			0.15	1.00	
Incremental Delay, d2	6.3			0.2	1.7	
Delay (s)	39.9			1.1	25.4	
Level of Service	D			A	C	
Approach Delay (s)	39.9			1.1	25.4	
Approach LOS	D			A	C	
Intersection Summary						
HCM Average Control Delay		19.0		HCM Level of Service		B
HCM Volume to Capacity ratio		0.52				
Actuated Cycle Length (s)		100.0		Sum of lost time (s)		6.0
Intersection Capacity Utilization		60.1%		ICU Level of Service		B
Analysis Period (min)		15				
c Critical Lane Group						



Movement	EBL	EBT	WBT	WBR	SWL	SWR	
Lane Configurations		↑↑↑	↑↑↑			↑	
Sign Control		Free	Free		Yield		
Grade		0%	0%		0%		
Volume (veh/h)	0	1607	3432	0	0	30	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly flow rate (vph)	0	1786	3813	0	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)		746	106				
pX, platoon unblocked	0.30				0.32	0.30	
vC, conflicting volume	3813				4409	1271	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	5752				6722	0	
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	90	
cM capacity (veh/h)	2				0	320	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SW 1
Volume Total	595	595	595	1271	1271	1271	33
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	33
cSH	1700	1700	1700	1700	1700	1700	320
Volume to Capacity	0.35	0.35	0.35	0.75	0.75	0.75	0.10
Queue Length 95th (ft)	0	0	0	0	0	0	9
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	17.5
Lane LOS							C
Approach Delay (s)	0.0			0.0			17.5
Approach LOS							C
Intersection Summary							
Average Delay			0.1				
Intersection Capacity Utilization			76.3%		ICU Level of Service		D
Analysis Period (min)			15				

	→	↗	←	↘	↙	↓
Movement	EBT	EBR	WBT	SBL2	SBL	SBT
Lane Configurations	↑↑↑		↑↑↑			↑↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	10	12
Total Lost time (s)	3.0		3.0			3.0
Lane Util. Factor	0.91		0.91			0.95
Frt	0.98		1.00			1.00
Flt Protected	1.00		1.00			0.99
Satd. Flow (prot)	4820		4916			3488
Flt Permitted	1.00		1.00			0.99
Satd. Flow (perm)	4820		4916			3488
Volume (vph)	1397	210	3432	118	54	412
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1552	233	3813	131	60	458
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1785	0	3813	0	0	649
Turn Type			custom		custom	
Protected Phases	2		2 3			4
Permitted Phases				4	4	
Actuated Green, G (s)	54.0		69.0			20.0
Effective Green, g (s)	55.0		71.0			23.0
Actuated g/C Ratio	0.55		0.71			0.23
Clearance Time (s)	4.0					6.0
Lane Grp Cap (vph)	2651		3490			802
v/s Ratio Prot	0.37		0.78			
v/s Ratio Perm						0.19
v/c Ratio	0.67		1.09			0.81
Uniform Delay, d1	16.1		14.5			36.4
Progression Factor	0.96		0.34			1.00
Incremental Delay, d2	1.3		42.2			8.6
Delay (s)	16.7		47.1			45.1
Level of Service	B		D			D
Approach Delay (s)	16.7		47.1			45.1
Approach LOS	B		D			D
Intersection Summary						
HCM Average Control Delay			38.2		HCM Level of Service	D
HCM Volume to Capacity ratio			1.02			
Actuated Cycle Length (s)			100.0		Sum of lost time (s)	6.0
Intersection Capacity Utilization			89.4%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑						↓↓			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)		3.0						3.0			
Lane Util. Factor		0.95						0.97			
Frt		1.00						1.00			
Flt Protected		1.00						0.95			
Satd. Flow (prot)		3303						3204			
Flt Permitted		1.00						0.95			
Satd. Flow (perm)		3303						3204			
Volume (vph)	0	131	0	0	0	0	125	139	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
Adj. Flow (vph)	0	146	0	0	0	0	139	154	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	32	0	0	0
Lane Group Flow (vph)	0	146	0	0	0	0	0	261	0	0	0
Turn Type							Split				
Protected Phases		6					5 8	5 8			
Permitted Phases											
Actuated Green, G (s)		15.0						75.0			
Effective Green, g (s)		17.0						77.0			
Actuated g/C Ratio		0.17						0.77			
Clearance Time (s)		5.0									
Lane Grp Cap (vph)		562						2467			
v/s Ratio Prot		c0.04						c0.08			
v/s Ratio Perm											
v/c Ratio		0.26						0.11			
Uniform Delay, d1		36.0						2.9			
Progression Factor		0.84						1.91			
Incremental Delay, d2		0.8						0.1			
Delay (s)		31.1						5.6			
Level of Service		C						A			
Approach Delay (s)		31.1			0.0			5.6		0.0	
Approach LOS		C			A			A		A	
Intersection Summary											
HCM Average Control Delay		14.0					HCM Level of Service		B		
HCM Volume to Capacity ratio		0.13									
Actuated Cycle Length (s)		100.0					Sum of lost time (s)		6.0		
Intersection Capacity Utilization		21.0%					ICU Level of Service		A		
Analysis Period (min)		15									
c Critical Lane Group											

HCM Signalized Intersection Capacity Analysis
10: West Virginia Ave. & Montana Ave.

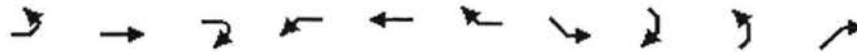
3011 Abdo New York Avenue
4/20/2006

												
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	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	3.0	3.0						3.0				
Lane Util. Factor	0.95	0.95						0.95				
Frt	1.00	1.00						1.00				
Flt Protected	0.95	0.95						1.00				
Satd. Flow (prot)	1569	1577						3303				
Flt Permitted	0.95	0.95						1.00				
Satd. Flow (perm)	1569	1577						3303				
Volume (vph)	250	6	0	0	0	0	0	198	0	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)	278	7	0	0	0	0	0	220	0	0	0	0
RTOR Reduction (vph)	32	32	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	107	114	0	0	0	0	0	220	0	0	0	0
Turn Type	Perm											
Protected Phases		6						8				
Permitted Phases	6											
Actuated Green, G (s)	76.0	76.0						12.0				
Effective Green, g (s)	77.0	77.0						17.0				
Actuated g/C Ratio	0.77	0.77						0.17				
Clearance Time (s)	4.0	4.0						8.0				
Lane Grp Cap (vph)	1208	1214						562				
v/s Ratio Prot								0.07				
v/s Ratio Perm	0.07	0.07										
v/c Ratio	0.09	0.09						0.39				
Uniform Delay, d1	2.8	2.9						36.9				
Progression Factor	0.10	0.16						1.32				
Incremental Delay, d2	0.1	0.2						1.7				
Delay (s)	0.4	0.6						50.4				
Level of Service	A	A						D				
Approach Delay (s)		0.5			0.0			50.4			0.0	
Approach LOS		A			A			D			A	
Intersection Summary												
HCM Average Control Delay		22.2						HCM Level of Service		C		
HCM Volume to Capacity ratio		0.15										
Actuated Cycle Length (s)		100.0						Sum of lost time (s)		6.0		
Intersection Capacity Utilization		33.6%						ICU Level of Service		A		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
11: New York Ave. & Montana Ave.

3011 Abdo New York Avenue
4/20/2006

												
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	11	11	11	11	11	11	10	10	10	10	10	10
Total Lost time (s)		3.0			3.0			3.0				
Lane Util. Factor		0.91			0.91			0.95				
Flt		1.00			1.00			1.00				
Flt Protected		1.00			1.00			0.99				
Satd. Flow (prot)		4916			4916			3267				
Flt Permitted		1.00			1.00			0.99				
Satd. Flow (perm)		4916			4916			3267				
Volume (vph)	0	1514	0	0	3332	0	100	348	0	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)	0	1682	0	0	3702	0	111	387	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1682	0	0	3702	0	0	498	0	0	0	0
Turn Type							Split					
Protected Phases		2			2		4	4				
Permitted Phases												
Actuated Green, G (s)		60.0			60.0			29.0				
Effective Green, g (s)		62.0			62.0			32.0				
Actuated g/C Ratio		0.62			0.62			0.32				
Clearance Time (s)		5.0			5.0			6.0				
Lane Grp Cap (vph)		3048			3048			1045				
v/s Ratio Prot		0.34			0.75			0.15				
v/s Ratio Perm												
v/c Ratio		0.55			1.21			0.48				
Uniform Delay, d1		11.0			19.0			27.3				
Progression Factor		0.10			0.51			0.97				
Incremental Delay, d2		0.5			96.9			1.5				
Delay (s)		1.6			106.5			28.1				
Level of Service		A			F			C				
Approach Delay (s)		1.6			106.5			28.1			0.0	
Approach LOS		A			F			C			A	
Intersection Summary												
HCM Average Control Delay		69.9			HCM Level of Service			E				
HCM Volume to Capacity ratio		0.96										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)			6.0				
Intersection Capacity Utilization		83.6%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SER	NEL	NER
Lane Configurations	↑↑↑			↑↑↑						↑
Sign Control	Free			Free			Stop		Yield	
Grade	0%			0%			0%		0%	
Volume (veh/h)	0	1514	0	0	3332	119	0	0	0	6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1682	0	0	3702	132	0	0	0	7
Pedestrians										
Lane Width (ft)										
Walking Speed (ft/s)										
Percent Blockage										
Right turn flare (veh)										
Median type							None		None	
Median storage veh										
Upstream signal (ft)		122								
pX, platoon unblocked				0.80			0.80	0.80	0.80	0.80
vC, conflicting volume	3834			1682			4336	5451	5517	561
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	3834			1359			4664	6052	6135	0
tC, single (s)	4.1			4.1			7.5	6.5	6.5	6.9
tC, 2 stage (s)										
tF (s)	2.2			2.2			3.5	4.0	4.0	3.3
p0 queue free %	100			100			100	100	100	99
cM capacity (veh/h)	51			403			0	0	0	871
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NE 1			
Volume Total	561	561	561	1481	1481	873	7			
Volume Left	0	0	0	0	0	0	0			
Volume Right	0	0	0	0	0	132	7			
cSH	1700	1700	1700	1700	1700	1700	871			
Volume to Capacity	0.33	0.33	0.33	0.87	0.87	0.51	0.01			
Queue Length 95th (ft)	0	0	0	0	0	0	1			
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.2			
Lane LOS							A			
Approach Delay (s)	0.0			0.0			9.2			
Approach LOS							A			
Intersection Summary										
Average Delay			0.0							
Intersection Capacity Utilization			70.4%			ICU Level of Service			C	
Analysis Period (min)			15							

																												
Movement	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER																	
Lane Configurations																												
Sign Control	Yield				Free				Free		Yield																	
Grade	0%				0%				0%		0%																	
Volume (veh/h)	45	0	0	0	0	0	0	539	30	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																	
Hourly flow rate (vph)	50	0	0	0	0	0	0	599	33	0	0																	
Pedestrians																												
Lane Width (ft)																												
Walking Speed (ft/s)																												
Percent Blockage																												
Right turn flare (veh)																												
Median type	None					None																						
Median storage veh																												
Upstream signal (ft)	121																											
pX, platoon unblocked																												
vC, conflicting volume	299	632	0	632	0				616	616																		
vC1, stage 1 conf vol																												
vC2, stage 2 conf vol																												
vCu, unblocked vol	299	632	0	632	0				616	616																		
tC, single (s)	7.5	6.5	6.9	4.1	4.1				7.5	6.5																		
tC, 2 stage (s)																												
tF (s)	3.5	4.0	3.3	2.2	2.2				3.5	4.0																		
p0 queue free %	92	100	100	100	100				100	100																		
cM capacity (veh/h)	630	396	1084	946	1622				375	405																		
Direction, Lane #	WB 1	WB 2	SB 1	SB 2																								
Volume Total	25	25	399	233																								
Volume Left	25	25	0	0																								
Volume Right	0	0	0	33																								
cSH	630	630	1700	1700																								
Volume to Capacity	0.04	0.04	0.23	0.14																								
Queue Length 95th (ft)	3	3	0	0																								
Control Delay (s)	10.9	10.9	0.0	0.0																								
Lane LOS	B	B																										
Approach Delay (s)	10.9			0.0																								
Approach LOS	B																											
Intersection Summary																												
Average Delay	0.8																											
Intersection Capacity Utilization	25.9%			ICU Level of Service		A																						
Analysis Period (min)	15																											



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations					↩		↩			
Sign Control		Yield			Yield		Free		Free	
Grade		0%			0%		0%		0%	
Volume (veh/h)	0	0	0	0	45	74	348	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
Hourly flow rate (vph)	0	0	0	0	50	82	387	0	0	0
Pedestrians										
Lane Width (ft)										
Walking Speed (ft/s)										
Percent Blockage										
Right turn flare (veh)										
Median type		None			None					
Median storage veh										
Upstream signal (ft)							115			
pX, platoon unblocked	0.89	0.89		0.89	0.89	0.89			0.89	
vC, conflicting volume	301	387	0	387	387	193			387	
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	99	196	0	196	196	0			196	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9			4.1	
tC, 2 stage (s)										
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3			2.2	
p0 queue free %	100	100	100	100	92	92			100	
cM capacity (veh/h)	670	625	1084	667	625	970			1229	
Direction, Lane #	WB 1	NB 1	NB 2							
Volume Total	132	129	258							
Volume Left	0	0	0							
Volume Right	82	0	0							
cSH	802	1622	1700							
Volume to Capacity	0.16	0.00	0.15							
Queue Length 95th (ft)	15	0	0							
Control Delay (s)	10.4	0.0	0.0							
Lane LOS	B									
Approach Delay (s)	10.4	0.0								
Approach LOS	B									
Intersection Summary										
Average Delay			2.6							
Intersection Capacity Utilization		23.5%			ICU Level of Service				A	
Analysis Period (min)			15							

HCM Signalized Intersection Capacity Analysis
1: New York Ave. & 16th Street

3011 Abdo New York Avenue
4/20/2006

												
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	11	11	11	11	11	11	10	10	10	13	13	13
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		0.91			0.91			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.87			0.97	
Flt Protected		1.00			1.00			1.00			0.98	
Satd. Flow (prot)		4909			4915			1511			1826	
Flt Permitted		0.94			0.90			0.99			0.93	
Satd. Flow (perm)		4613			4419			1498			1731	
Volume (vph)	1	3207	24	5	1675	0	3	0	56	3	3	2
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)	1	3563	27	6	1861	0	3	0	62	3	3	2
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	3591	0	0	1867	0	0	65	0	0	6	0
Confl. Peds. (#/hr)	1		10	10		1						
Turn Type	Perm		Perm		Perm		Perm		Perm		Perm	
Protected Phases	2		2		2		4		4		4	
Permitted Phases	2		2		2		4		4		4	
Actuated Green, G (s)	100.1		100.1		100.1		8.9		8.9		8.9	
Effective Green, g (s)	102.1		102.1		102.1		11.9		11.9		11.9	
Actuated g/C Ratio	0.85		0.85		0.85		0.10		0.10		0.10	
Clearance Time (s)	5.0		5.0		5.0		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)	3925		3760		3760		149		149		172	
v/s Ratio Prot												
v/s Ratio Perm	c0.78		0.42		0.42		c0.04		c0.04		0.00	
v/c Ratio	0.91		0.50		0.50		0.44		0.44		0.04	
Uniform Delay, d1	6.0		2.3		2.3		50.9		50.9		48.9	
Progression Factor	1.00		2.56		2.56		1.00		1.00		1.00	
Incremental Delay, d2	4.4		0.4		0.4		2.0		2.0		0.1	
Delay (s)	10.4		6.3		6.3		52.9		52.9		49.0	
Level of Service	B		A		A		D		D		D	
Approach Delay (s)	10.4		6.3		6.3		52.9		52.9		49.0	
Approach LOS	B		A		A		D		D		D	
Intersection Summary												
HCM Average Control Delay	9.6		9.6		9.6		HCM Level of Service		A		A	
HCM Volume to Capacity ratio	0.87		0.87		0.87		0.87		0.87		0.87	
Actuated Cycle Length (s)	120.0		120.0		120.0		Sum of lost time (s)		6.0		6.0	
Intersection Capacity Utilization	77.3%		77.3%		77.3%		ICU Level of Service		D		D	
Analysis Period (min)	15		15		15		15		15		15	
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
2: New York Ave. & Bladensburg Rd.

3011 Abdo New York Avenue
4/20/2006

												
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	10	11	11	10	11	11	11	11	11	10	10	10
Total Lost time (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Util. Factor	0.97	0.91		0.97	0.91			0.91	0.91		0.91	0.91
Frt	1.00	1.00		1.00	1.00			0.99	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (prot)	3204	4907		3204	4897			3242	1393		3164	1345
Flt Permitted	0.95	1.00		0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	3204	4907		3204	4897			3242	1393		3164	1345
Volume (vph)	315	3584	41	250	1719	44	0	521	444	0	474	228
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)	350	3982	46	278	1910	49	0	579	493	0	527	253
RTOR Reduction (vph)	0	1	0	0	2	0	0	4	0	0	0	1
Lane Group Flow (vph)	350	4027	0	278	1957	0	0	620	448	0	527	252
Turn Type	Prot			Prot				pm+ov			pm+ov	
Protected Phases	5	2 5		1	6			4	1		8	5
Permitted Phases									4			8
Actuated Green, G (s)	37.0	79.0		8.0	49.0			16.0	24.0		16.0	53.0
Effective Green, g (s)	39.0	80.0		11.0	52.0			20.0	31.0		20.0	59.0
Actuated g/C Ratio	0.32	0.67		0.09	0.43			0.17	0.26		0.17	0.49
Clearance Time (s)	5.0			6.0	6.0			7.0	6.0		7.0	5.0
Lane Grp Cap (vph)	1041	3271		294	2122			540	395		527	695
v/s Ratio Prot	0.11	c0.82		0.09	0.40			0.19	c0.10		0.17	0.12
v/s Ratio Perm									0.22			0.07
v/c Ratio	0.34	1.23		0.95	0.92			1.15	1.13		1.00	0.36
Uniform Delay, d1	30.7	20.0		54.2	32.1			50.0	44.5		50.0	18.9
Progression Factor	0.80	0.71		1.00	1.00			1.00	1.00		0.74	0.93
Incremental Delay, d2	0.1	104.3		40.2	8.1			86.4	87.1		38.1	1.4
Delay (s)	24.6	118.5		94.4	40.2			136.4	131.6		74.8	18.9
Level of Service	C	F		F	D			F	F		E	B
Approach Delay (s)		111.0			47.0			134.4			56.7	
Approach LOS		F			D			F			E	
Intersection Summary												
HCM Average Control Delay		92.0						HCM Level of Service		F		
HCM Volume to Capacity ratio		1.20										
Actuated Cycle Length (s)		120.0						Sum of lost time (s)		6.0		
Intersection Capacity Utilization		106.4%						ICU Level of Service		G		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: Mt. Olivet Rd. & West Virginia Ave.

3011 Abdo New York Avenue

4/20/2006

													
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	10	10	10	10	10	10	10	10	10	10	10	10	
Total Lost time (s)		3.0			3.0			3.0		3.0	3.0		
Lane Util. Factor		0.95			0.95			0.95		1.00	0.95		
Frpb, ped/bikes		1.00			0.99			1.00		1.00	1.00		
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00		
Frt		0.99			0.97			0.99		1.00	1.00		
Flt Protected		1.00			1.00			1.00		0.95	1.00		
Satd. Flow (prot)		3250			3121			3082		1486	3121		
Flt Permitted		0.69			0.82			0.58		0.18	1.00		
Satd. Flow (perm)		2251			2563			1783		288	3121		
Volume (vph)	94	905	60	15	532	124	43	656	69	288	244	8	
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)	104	1006	67	17	591	138	48	729	77	320	271	9	
RTOR Reduction (vph)	0	4	0	0	19	0	0	7	0	0	2	0	
Lane Group Flow (vph)	0	1173	0	0	727	0	0	847	0	320	278	0	
Confl. Peds. (#/hr)	34		45	45		34	2		7	7		2	
Bus Blockages (#/hr)	0	0	0	0	10	10	0	0	0	0	0	0	
Parking (#/hr)							0	0	0	0	0	0	
Turn Type	Perm		Perm		Perm		custom						
Protected Phases	4		8		2		1 6 1						
Permitted Phases	4		8		2		6						
Actuated Green, G (s)	38.0		38.0		37.0		50.0 52.0						
Effective Green, g (s)	40.0		40.0		39.0		51.0 54.0						
Actuated g/C Ratio	0.40		0.40		0.39		0.51 0.54						
Clearance Time (s)	5.0		5.0		5.0		2.0						
Lane Grp Cap (vph)	900		1025		695		291 1685						
v/s Ratio Prot							c0.13 0.09						
v/s Ratio Perm	c0.52		0.28		c0.47		0.43						
v/c Ratio	1.30		0.71		1.22		1.10 0.16						
Uniform Delay, d1	30.0		25.1		30.5		18.6 11.6						
Progression Factor	1.00		1.00		1.00		1.00 1.00						
Incremental Delay, d2	144.5		4.1		111.0		82.1 0.2						
Delay (s)	174.5		29.3		141.5		100.7 11.8						
Level of Service	F		C		F		F B						
Approach Delay (s)	174.5		29.3		141.5		59.2						
Approach LOS	F		C		F		E						
Intersection Summary													
HCM Average Control Delay	113.6		HCM Level of Service		F								
HCM Volume to Capacity ratio	1.24												
Actuated Cycle Length (s)	100.0		Sum of lost time (s)		9.0								
Intersection Capacity Utilization	123.5%		ICU Level of Service		H								
Analysis Period (min)	15												
c Critical Lane Group													

HCM Unsignalized Intersection Capacity Analysis
4: Montana Ave. & 17th Street

3011 Abdo New York Avenue
4/20/2006

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	0	169	9	38	212	1	12	1	32	0	0	1
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
Hourly flow rate (vph)	0	188	10	42	236	1	13	1	36	0	0	1
Pedestrians								11			8	
Lane Width (ft)								10.0			10.0	
Walking Speed (ft/s)								4.0			4.0	
Percent Blockage								1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)	850											
pX, platoon unblocked												
vC, conflicting volume	245			209			525	533	204	557	537	244
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	245			209			525	533	204	557	537	244
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			97	100	96	100	100	100
cM capacity (veh/h)	1314			1352			443	433	830	405	430	790
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	198	279	50	1								
Volume Left	0	42	13	0								
Volume Right	10	1	36	1								
cSH	1314	1352	663	790								
Volume to Capacity	0.00	0.03	0.08	0.00								
Queue Length 95th (ft)	0	2	6	0								
Control Delay (s)	0.0	1.4	10.9	9.6								
Lane LOS	A		B	A								
Approach Delay (s)	0.0	1.4	10.9	9.6								
Approach LOS	B		A									
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization	43.4%		ICU Level of Service		A							
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
5: Montana Ave. & Bladensburg Rd.

3011 Abdo New York Avenue

4/20/2006

												
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	11	11	11	10	10	10	11	11	11	11	11	11
Total Lost time (s)		3.0	3.0		3.0			3.0			3.0	
Lane Util. Factor		1.00	1.00		1.00			0.91			0.91	
Frpb, ped/bikes		1.00	1.00		1.00			1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.97			1.00			0.98	
Flt Protected		0.97	1.00		0.98			0.99			1.00	
Satd. Flow (prot)		1576	1378		1658			4837			4819	
Flt Permitted		0.83	1.00		0.88			0.69			0.91	
Satd. Flow (perm)		1345	1378		1496			3343			4389	
Volume (vph)	34	26	142	28	29	14	153	1021	12	12	732	94
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)	38	29	158	31	32	16	170	1134	13	13	813	104
RTOR Reduction (vph)	0	0	122	0	9	0	0	1	0	0	16	0
Lane Group Flow (vph)	0	67	36	0	70	0	0	1316	0	0	914	0
Confl. Peds. (#/hr)							1		2	2		1
Bus Blockages (#/hr)	0	0	0	0	0	0	0	6	6	0	0	0
Parking (#/hr)	0	0	0									
Turn Type	Perm		Perm	Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		20.0	20.0		20.0			68.0			45.0	
Effective Green, g (s)		23.0	23.0		23.0			71.0			48.0	
Actuated g/C Ratio		0.23	0.23		0.23			0.71			0.48	
Clearance Time (s)		6.0	6.0		6.0			6.0			6.0	
Lane Grp Cap (vph)		309	317		344			2672			2107	
v/s Ratio Prot								c0.10				
v/s Ratio Perm		c0.05	0.03		0.05			c0.25			0.21	
v/c Ratio		0.22	0.11		0.20			0.49			0.43	
Uniform Delay, d1		31.2	30.4		31.1			6.5			17.1	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		1.6	0.7		1.3			0.7			0.7	
Delay (s)		32.8	31.2		32.4			7.1			17.7	
Level of Service		C	C		C			A			B	
Approach Delay (s)		31.7			32.4			7.1			17.7	
Approach LOS		C			C			A			B	
Intersection Summary												
HCM Average Control Delay		13.9					HCM Level of Service				B	
HCM Volume to Capacity ratio		0.42										
Actuated Cycle Length (s)		100.0					Sum of lost time (s)			6.0		
Intersection Capacity Utilization		114.8%					ICU Level of Service			H		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
6: Queens Chapel Rd. & Bladensburg Rd.

3011 Abdo New York Avenue
4/20/2006

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↑↑↑	↑↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	10	10	10	10
Total Lost time (s)	3.0			3.0	3.0	
Lane Util. Factor	1.00			0.91	0.91	
Frt	0.93			1.00	0.99	
Flt Protected	0.98			0.99	1.00	
Satd. Flow (prot)	1640			4715	4684	
Flt Permitted	0.98			0.74	1.00	
Satd. Flow (perm)	1640			3504	4684	
Volume (vph)	132	126	107	696	643	62
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	147	140	119	773	714	69
RTOR Reduction (vph)	28	0	0	0	10	0
Lane Group Flow (vph)	259	0	0	892	773	0
Turn Type		pm+pt				
Protected Phases	4		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	23.0			86.0	64.0	
Effective Green, g (s)	26.0			88.0	65.0	
Actuated g/C Ratio	0.22			0.73	0.54	
Clearance Time (s)	6.0			5.0	4.0	
Lane Grp Cap (vph)	355			2771	2537	
v/s Ratio Prot	c0.16			c0.05	0.17	
v/s Ratio Perm				c0.18		
v/c Ratio	0.73			0.32	0.30	
Uniform Delay, d1	43.7			5.6	15.1	
Progression Factor	1.00			0.40	1.00	
Incremental Delay, d2	12.4			0.2	0.3	
Delay (s)	56.1			2.4	15.4	
Level of Service	E			A	B	
Approach Delay (s)	56.1			2.4	15.4	
Approach LOS	E			A	B	
Intersection Summary						
HCM Average Control Delay		15.4		HCM Level of Service		B
HCM Volume to Capacity ratio		0.41				
Actuated Cycle Length (s)		120.0		Sum of lost time (s)		6.0
Intersection Capacity Utilization		54.5%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						



Movement	EBL	EBT	WBT	WBR	SWL	SWR	
Lane Configurations		↑↑↑	↑↑↑			↑	
Sign Control		Free	Free		Yield		
Grade		0%	0%		0%		
Volume (veh/h)	0	3595	1814	0	0	32	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly flow rate (vph)	0	3994	2016	0	0	36	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type					None		
Median storage veh							
Upstream signal (ft)		746	106				
pX, platoon unblocked	0.86				0.25	0.86	
vC, conflicting volume	2016				3347	672	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1855				1861	291	
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	94	
cM capacity (veh/h)	277				16	606	
Direction Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SW 1
Volume Total	1331	1331	1331	672	672	672	36
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	36
cSH	1700	1700	1700	1700	1700	1700	606
Volume to Capacity	0.78	0.78	0.78	0.40	0.40	0.40	0.06
Queue Length 95th (ft)	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.3
Lane LOS							B
Approach Delay (s)	0.0			0.0			11.3
Approach LOS							B
Intersection Summary							
Average Delay			0.1				
Intersection Capacity Utilization			72.8%		ICU Level of Service		C
Analysis Period (min)			15				

	→	↗	←	↘	↓	↓
Movement	EBT	EBR	WBT	SBL2	SBL	SBT
Lane Configurations	↑↑↑		↑↑↑			↑↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	10	12
Total Lost time (s)	3.0		3.0			3.0
Lane Util. Factor	0.91		0.91			0.95
Frt	1.00		1.00			1.00
Flt Protected	1.00		1.00			0.98
Satd. Flow (prot)	4902		4916			3453
Flt Permitted	1.00		1.00			0.98
Satd. Flow (perm)	4902		4916			3453
Volume (vph)	3527	69	1814	192	145	340
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	3919	77	2016	213	161	378
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	3996	0	2016	0	0	752
Turn Type			custom		custom	
Protected Phases	2		2 3			4
Permitted Phases				4	4	
Actuated Green, G (s)	62.0		94.0			15.0
Effective Green, g (s)	63.0		96.0			18.0
Actuated g/C Ratio	0.52		0.80			0.15
Clearance Time (s)	4.0					6.0
Lane Grp Cap (vph)	2574		3933			518
v/s Ratio Prot	c0.82		c0.41			
v/s Ratio Perm						0.22
v/c Ratio	1.55		0.51			1.45
Uniform Delay, d1	28.5		4.1			51.0
Progression Factor	0.83		0.06			1.00
Incremental Delay, d2	249.7		0.4			213.9
Delay (s)	273.5		0.6			264.9
Level of Service	F		A			F
Approach Delay (s)	273.5		0.6			264.9
Approach LOS	F		A			F
Intersection Summary						
HCM Average Control Delay		191.2		HCM Level of Service		F
HCM Volume to Capacity ratio		1.23				
Actuated Cycle Length (s)		120.0		Sum of lost time (s)		6.0
Intersection Capacity Utilization		95.5%		ICU Level of Service		F
Analysis Period (min)		15				
c Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑						↑↑			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)		3.0						3.0			
Lane Util. Factor		0.95						0.97			
Frt		1.00						1.00			
Flt Protected		1.00						0.95			
Satd. Flow (prot)		3303						3204			
Flt Permitted		1.00						0.95			
Satd. Flow (perm)		3303						3204			
Volume (vph)	0	513	0	0	0	0	34	179	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
Adj. Flow (vph)	0	570	0	0	0	0	38	199	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	13	0	0	0
Lane Group Flow (vph)	0	570	0	0	0	0	0	224	0	0	0
Turn Type							Split				
Protected Phases		6					5 8	5 8			
Permitted Phases											
Actuated Green, G (s)		32.0						78.0			
Effective Green, g (s)		34.0						80.0			
Actuated g/C Ratio		0.28						0.67			
Clearance Time (s)		5.0									
Lane Grp Cap (vph)		936						2136			
v/s Ratio Prot		c0.17						c0.07			
v/s Ratio Perm											
v/c Ratio		0.61						0.11			
Uniform Delay, d1		37.2						7.2			
Progression Factor		1.00						1.09			
Incremental Delay, d2		2.9						0.0			
Delay (s)		40.2						7.8			
Level of Service		D						A			
Approach Delay (s)		40.2			0.0			7.8		0.0	
Approach LOS		D			A			A		A	
Intersection Summary											
HCM Average Control Delay		30.7				HCM Level of Service		C			
HCM Volume to Capacity ratio		0.26									
Actuated Cycle Length (s)		120.0				Sum of lost time (s)		6.0			
Intersection Capacity Utilization		30.2%				ICU Level of Service		A			
Analysis Period (min)		15									
c Critical Lane Group											

												
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	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	3.0	3.0						3.0				
Lane Util. Factor	0.95	0.95						0.95				
Frt	1.00	1.00						0.99				
Flt Protected	0.95	0.96						1.00				
Satd. Flow (prot)	1569	1585						3282				
Flt Permitted	0.95	0.96						1.00				
Satd. Flow (perm)	1569	1585						3282				
Volume (vph)	504	44	0	0	0	0	0	205	9	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)	560	49	0	0	0	0	0	228	10	0	0	0
RTOR Reduction (vph)	8	8	0	0	0	0	0	3	0	0	0	0
Lane Group Flow (vph)	289	304	0	0	0	0	0	235	0	0	0	0
Turn Type	Perm											
Protected Phases		6						8				
Permitted Phases	6											
Actuated Green, G (s)	101.0	101.0						7.0				
Effective Green, g (s)	102.0	102.0						12.0				
Actuated g/C Ratio	0.85	0.85						0.10				
Clearance Time (s)	4.0	4.0						8.0				
Lane Grp Cap (vph)	1334	1347						328				
v/s Ratio Prot								c0.07				
v/s Ratio Perm	0.18	0.19										
v/c Ratio	0.22	0.23						0.72				
Uniform Delay, d1	1.7	1.7						52.4				
Progression Factor	0.49	0.68						1.00				
Incremental Delay, d2	0.3	0.3						12.7				
Delay (s)	1.1	1.5						65.0				
Level of Service	A	A						E				
Approach Delay (s)		1.3			0.0			65.0			0.0	
Approach LOS		A			A			E			A	
Intersection Summary												
HCM Average Control Delay		19.2			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.28										
Actuated Cycle Length (s)		120.0			Sum of lost time (s)			6.0				
Intersection Capacity Utilization		50.0%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

												
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	11	11	11	11	11	11	10	10	10	10	10	10
Total Lost time (s)		3.0			3.0			3.0				
Lane Util. Factor		0.91			0.91			0.95				
Frt		1.00			1.00			1.00				
Flt Protected		1.00			1.00			0.99				
Satd. Flow (prot)		4916			4916			3280				
Flt Permitted		1.00			1.00			0.99				
Satd. Flow (perm)		4916			4916			3280				
Volume (vph)	0	3718	0	0	1711	0	103	606	0	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)	0	4131	0	0	1901	0	114	673	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	4131	0	0	1901	0	0	787	0	0	0	0
Turn Type							Split					
Protected Phases		2			2		4	4				
Permitted Phases												
Actuated Green, G (s)		68.0			68.0			41.0				
Effective Green, g (s)		70.0			70.0			44.0				
Actuated g/C Ratio		0.58			0.58			0.37				
Clearance Time (s)		5.0			5.0			6.0				
Lane Grp Cap (vph)		2868			2868			1203				
v/s Ratio Prot		c0.84			0.39			c0.24				
v/s Ratio Perm												
v/c Ratio		1.44			0.66			0.65				
Uniform Delay, d1		25.0			17.0			31.7				
Progression Factor		0.09			0.37			1.50				
Incremental Delay, d2		198.4			0.6			2.6				
Delay (s)		200.7			6.9			50.0				
Level of Service		F			A			D				
Approach Delay (s)		200.7			6.9			50.0			0.0	
Approach LOS		F			A			D			A	
Intersection Summary												
HCM Average Control Delay		129.3				HCM Level of Service		F				
HCM Volume to Capacity ratio		1.14										
Actuated Cycle Length (s)		120.0				Sum of lost time (s)		6.0				
Intersection Capacity Utilization		98.2%				ICU Level of Service		F				
Analysis Period (min)		15										
c Critical Lane Group												

											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SER	NEL	NER	
Lane Configurations		↑↑↑			↑↑↑					↑	
Sign Control		Free			Free		Stop		Yield		
Grade		0%			0%		0%		0%		
Volume (veh/h)	0	3718	0	0	1711	208	0	0	0	52	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly flow rate (vph)	0	4131	0	0	1901	231	0	0	0	58	
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type							None		None		
Median storage (veh)											
Upstream signal (ft)		122									
pX, platoon unblocked				0.42			0.42	0.42	0.42	0.42	
vC, conflicting volume	2132			4131			3451	6148	6263	1377	
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	2132			5688			4073	10479	10754	0	
tC, single (s)	4.1			4.1			7.5	6.5	6.5	6.9	
tC, 2 stage (s)											
tF (s)	2.2			2.2			3.5	4.0	4.0	3.3	
p0 queue free %	100			100			100	100	100	87	
cM capacity (veh/h)	251			4			0	0	0	456	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NE 1				
Volume Total	1377	1377	1377	760	760	611	58				
Volume Left	0	0	0	0	0	0	0				
Volume Right	0	0	0	0	0	231	58				
cSH	1700	1700	1700	1700	1700	1700	456				
Volume to Capacity	0.81	0.81	0.81	0.45	0.45	0.36	0.13				
Queue Length 95th (ft)	0	0	0	0	0	0	11				
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	14.0				
Lane LOS							B				
Approach Delay (s)	0.0			0.0			14.0				
Approach LOS							B				
Intersection Summary											
Average Delay			0.1								
Intersection Capacity Utilization			81.8%		ICU Level of Service				D		
Analysis Period (min)			15								

																												
Movement	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER																	
Lane Configurations																												
Sign Control	Yield			Free				Free																				
Grade	0%			0%				0%																				
Volume (veh/h)	12	0	0	0	0	0	0	665	32	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																	
Hourly flow rate (vph)	13	0	0	0	0	0	0	739	36	0	0																	
Pedestrians																												
Lane Width (ft)																												
Walking Speed (ft/s)																												
Percent Blockage																												
Right turn flare (veh)																												
Median type	None			None																								
Median storage (veh)																												
Upstream signal (ft)	121																											
pX, platoon unblocked																												
vC, conflicting volume	369	774	0	774				0	757 757																			
vC1, stage 1 conf vol																												
vC2, stage 2 conf vol																												
vCu, unblocked vol	369	774	0	774				0	757 757																			
tC, single (s)	7.5	6.5	6.9	4.1				4.1	7.5 6.5																			
tC, 2 stage (s)																												
tF (s)	3.5	4.0	3.3	2.2				2.2	3.5 4.0																			
p0 queue free %	98	100	100	100				100	100 100																			
cM capacity (veh/h)	562	328	1084	837				1622	297 336																			
Direction, Lane #	WB 1	WB 2	SB 1	SB 2																								
Volume Total	7	7	493	282																								
Volume Left	7	7	0	0																								
Volume Right	0	0	0	36																								
cSH	562	562	1700	1700																								
Volume to Capacity	0.01	0.01	0.29	0.17																								
Queue Length 95th (ft)	1	1	0	0																								
Control Delay (s)	11.5	11.5	0.0	0.0																								
Lane LOS	B	B																										
Approach Delay (s)	11.5			0.0																								
Approach LOS	B																											
Intersection Summary																												
Average Delay	0.2																											
Intersection Capacity Utilization	29.4%			ICU Level of Service				A																				
Analysis Period (min)	15																											



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Sign Control		Yield			Yield		Free		Free	
Grade		0%			0%		0%		0%	
Volume (veh/h)	0	0	0	0	12	196	606	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
Hourly flow rate (vph)	0	0	0	0	13	218	673	0	0	0
Pedestrians										
Lane Width (ft)										
Walking Speed (ft/s)										
Percent Blockage										
Right turn flare (veh)										
Median type		None			None					
Median storage veh										
Upstream signal (ft)							115			
pX, platoon unblocked	0.81	0.81		0.81	0.81	0.81			0.81	
vC, conflicting volume	561	673	0	673	673	337			673	
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	223	361	0	361	361	0			361	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9			4.1	
tC, 2 stage (s)										
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3			2.2	
p0 queue free %	100	100	100	100	97	75			100	
cM capacity (veh/h)	425	457	1084	461	457	878			967	
Direction, Lane #	WB 1	NB 1	NB 2							
Volume Total	231	224	449							
Volume Left	0	0	0							
Volume Right	218	0	0							
cSH	834	1622	1700							
Volume to Capacity	0.28	0.00	0.26							
Queue Length 95th (ft)	28	0	0							
Control Delay (s)	11.0	0.0	0.0							
Lane LOS	B									
Approach Delay (s)	11.0	0.0								
Approach LOS	B									
Intersection Summary										
Average Delay			2.8							
Intersection Capacity Utilization			36.7%		ICU Level of Service				A	
Analysis Period (min)			15							