

APPENDIX E

Existing Capacity Analysis

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			0.94			0.97		
Flt Protected	1.00			1.00			0.99			0.98		
Satd. Flow (prot)	4903			4914			1621			1831		
Flt Permitted	1.00			0.92			0.97			0.89		
Satd. Flow (perm)	4903			4519			1573			1656		
Volume (vph)	0	1362	21	17	2890	3	3	10	11	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	1513	23	19	3211	3	3	11	12	2	2	1
RTOR Reduction (vph)	0	1	0	0	0	0	0	11	0	0	1	0
Lane Group Flow (vph)	0	1535	0	0	3233	0	0	15	0	0	4	0
Confl. Peds. (#/hr)				3	3	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)	4197			3868			132			139		
v/s Ratio Prot	0.31											
v/s Ratio Perm				c0.72			c0.01			0.00		
v/c Ratio	0.37			0.84			0.11			0.03		
Uniform Delay, d1	1.5			3.6			42.4			42.1		
Progression Factor	1.00			0.40			1.00			1.00		
Incremental Delay, d2	0.2			0.2			0.4			0.1		
Delay (s)	1.8			1.7			42.7			42.1		
Level of Service	A			A			D			D		
Approach Delay (s)	1.8			1.7			42.7			42.1		
Approach LOS	A			A			D			D		
Intersection Summary												
HCM Average Control Delay	2.0			HCM Level of Service			A					
HCM Volume to Capacity ratio	0.77											
Actuated Cycle Length (s)	100.0			Sum of lost time (s)			6.0					
Intersection Capacity Utilization	82.0%			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
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.98	0.85
Flt 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
Flt 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)	212	1310	36	515	2737	22	0	351	191	0	574	493
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)	236	1456	40	572	3041	24	0	390	212	0	638	548
RTOR Reduction (vph)	0	3	0	0	1	0	0	0	1	0	11	1
Lane Group Flow (vph)	236	1493	0	572	3064	0	0	390	211	0	721	453
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	0.07	0.31		0.18	c0.62			0.12	0.08		0.23	c0.08
v/s Ratio Perm									0.07			0.26
v/c Ratio	0.82	0.92		0.54	1.09			0.48	0.25		0.93	0.91
Uniform Delay, d1	44.7	32.3		27.3	21.5			31.9	10.3		36.6	31.5
Progression Factor	0.82	0.61		1.00	1.00			1.38	1.64		0.52	0.42
Incremental Delay, d2	20.4	9.5		2.0	49.1			1.9	0.7		16.7	20.5
Delay (s)	57.1	29.2		29.3	70.6			46.0	17.6		35.8	33.7
Level of Service	E	C		C	E			D	B		D	C
Approach Delay (s)		33.0			64.1			36.0			35.0	
Approach LOS		C			E			D			C	
Intersection Summary												
HCM Average Control Delay		49.4			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		90.5%			ICU Level of Service			E				
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)		3229			3169			3050		1649	3134	
Flt Permitted		0.72			0.86			0.54		0.49	1.00	
Satd. Flow (perm)		2348			2741			1656		848	3134	
Volume (vph)	49	373	41	58	630	91	58	211	34	121	433	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)	54	414	46	64	700	101	64	234	38	134	481	4
RTOR Reduction (vph)	0	7	0	0	10	0	0	10	0	0	0	0
Lane Group Flow (vph)	0	507	0	0	855	0	0	326	0	134	485	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		50.0	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		2.0		
Lane Grp Cap (vph)		939			1096			596		553	1692	
v/s Ratio Prot										0.04	c0.15	
v/s Ratio Perm		0.22			c0.31			c0.20		0.09		
v/c Ratio		0.54			0.78			0.89dl		0.24	0.29	
Uniform Delay, d1		23.0			26.2			25.5		13.2	12.5	
Progression Factor		1.00			1.00			1.00		1.07	1.21	
Incremental Delay, d2		2.2			5.5			3.6		0.9	0.4	
Delay (s)		25.2			31.7			29.1		15.0	15.5	
Level of Service		C			C			C		B	B	
Approach Delay (s)		25.2			31.7			29.1			15.4	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM Average Control Delay		25.6		HCM Level of Service		C						
HCM Volume to Capacity ratio		0.61										
Actuated Cycle Length (s)		100.0		Sum of lost time (s)		9.0						
Intersection Capacity Utilization		116.0%		ICU Level of Service		H						
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	105	11	210	201	2	3	1	32	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	117	12	233	223	2	3	1	36	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	226			139			828	829	133	854	834	224	
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	226			139			828	829	133	854	834	224	
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			84			99	100	96	100	100	100	
cM capacity (veh/h)	1343			1435			250	254	910	232	252	815	
Direction Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	131	459	40	0									
Volume Left	2	233	3	0									
Volume Right	12	2	36	0									
cSH	1343	1435	705	1700									
Volume to Capacity	0.00	0.16	0.06	0.00									
Queue Length 95th (ft)	0	15	5	0									
Control Delay (s)	0.1	4.8	10.4	0.0									
Lane LOS	A	A	B	A									
Approach Delay (s)	0.1	4.8	10.4	0.0									
Approach LOS				B	A								
Intersection Summary													
Average Delay	4.2												
Intersection Capacity Utilization	39.0%			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	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)		1721	1356		1497			4818			4752	
Flt Permitted		0.79	1.00		0.87			0.66			0.94	
Satd. Flow (perm)		1411	1356		1337			3192			4461	
Volume (vph)	29	4	95	32	28	5	137	514	6	3	1000	232
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)	32	4	106	36	31	6	152	571	7	3	1111	258
RTOR Reduction (vph)	0	0	77	0	3	0	0	1	0	0	38	0
Lane Group Flow (vph)	0	36	29	0	70	0	0	729	0	0	1334	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)		381	366		361			2561			1695	
v/s Ratio Prot								c0.07				
v/s Ratio Perm		0.03	0.02		c0.05			0.12			c0.30	
v/c Ratio		0.09	0.08		0.19			0.28			0.79	
Uniform Delay, d1		27.3	27.2		28.1			6.7			27.4	
Progression Factor		1.14	2.13		1.00			1.00			0.58	
Incremental Delay, d2		0.5	0.4		1.2			0.3			2.7	
Delay (s)		31.6	58.4		29.3			7.0			18.8	
Level of Service		C	E		C			A			B	
Approach Delay (s)		51.6			29.3			7.0			18.8	
Approach LOS		D			C			A			B	
Intersection Summary												
HCM Average Control Delay		17.4										
HCM Volume to Capacity ratio		0.47										
Actuated Cycle Length (s)		100.0							9.0			
Intersection Capacity Utilization		112.5%										
Analysis Period (min)		15										
c Critical Lane Group												

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			↑↑↑	↑↑↑	
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			0.65	1.00	
Satd. Flow (perm)	1636			3094	4609	
Volume (vph)	110	116	150	490	854	204
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	122	129	167	544	949	227
RTOR Reduction (vph)	38	0	0	0	40	0
Lane Group Flow (vph)	213	0	0	711	1136	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			2581	1890	
v/s Ratio Prot	c0.13			c0.07	c0.25	
v/s Ratio Perm				0.12		
v/c Ratio	0.54			0.28	0.60	
Uniform Delay, d1	33.2			5.6	23.1	
Progression Factor	1.00			0.16	1.00	
Incremental Delay, d2	5.3			0.2	1.4	
Delay (s)	38.5			1.1	24.5	
Level of Service	D			A	C	
Approach Delay (s)	38.5			1.1	24.5	
Approach LOS	D			A	C	
Intersection Summary						
HCM Average Control Delay		18.4		HCM Level of Service		B
HCM Volume to Capacity ratio		0.48				
Actuated Cycle Length (s)		100.0		Sum of lost time (s)		6.0
Intersection Capacity Utilization		56.8%		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	1500	3201	0	0	28	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly flow rate (vph)	0	1667	3557	0	0	31	
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				0.31	0.30	
vC, conflicting volume	3557				4112	1186	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	4884				6020	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)	6				0	320	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SW 1
Volume Total	556	556	556	1186	1186	1186	31
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	31
cSH	1700	1700	1700	1700	1700	1700	320
Volume to Capacity	0.33	0.33	0.33	0.70	0.70	0.70	0.10
Queue Length 95th (ft)	0	0	0	0	0	0	8
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	17.4
Lane LOS							C
Approach Delay (s)	0.0			0.0			17.4
Approach LOS							C
Intersection Summary							
Average Delay			0.1				
Intersection Capacity Utilization			71.8%		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	0.98		1.00			1.00
Flt Protected	1.00		1.00			0.99
Satd. Flow (prot)	4819		4916			3488
Flt Permitted	1.00		1.00			0.99
Satd. Flow (perm)	4819		4916			3488
Volume (vph)	1304	196	3201	110	51	384
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1449	218	3557	122	57	427
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1667	0	3557	0	0	606
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)	2650		3490			802
v/s Ratio Prot	0.35		0.72			
v/s Ratio Perm						0.17
v/c Ratio	0.63		1.02			0.76
Uniform Delay, d1	15.5		14.5			35.9
Progression Factor	0.97		0.29			1.00
Incremental Delay, d2	1.1		10.6			6.5
Delay (s)	16.1		14.9			42.4
Level of Service	B		B			D
Approach Delay (s)	16.1		14.9			42.4
Approach LOS	B		B			D
Intersection Summary						
HCM Average Control Delay		18.1		HCM Level of Service		B
HCM Volume to Capacity ratio		0.95				
Actuated Cycle Length (s)		100.0		Sum of lost time (s)		6.0
Intersection Capacity Utilization		83.8%		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	122	0	0	0	0	117	130	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	136	0	0	0	0	130	144	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	30	0	0	0
Lane Group Flow (vph)	0	136	0	0	0	0	0	244	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		0.24						0.10			
Uniform Delay, d1		35.9						2.9			
Progression Factor		0.82						2.07			
Incremental Delay, d2		0.8						0.1			
Delay (s)		30.2						6.0			
Level of Service		C						A			
Approach Delay (s)		30.2			0.0			6.0		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		0.12									
Actuated Cycle Length (s)		100.0					Sum of lost time (s)		6.0		
Intersection Capacity Utilization		20.3%					ICU Level of Service		A		
Analysis Period (min)		15									
c Critical Lane Group											

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

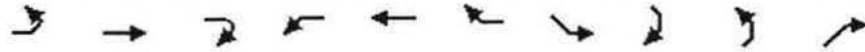
3011 Abdo New York Avenue
4/20/2006

												
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)	233	6	0	0	0	0	0	185	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)	259	7	0	0	0	0	0	206	0	0	0	0
RTOR Reduction (vph)	30	30	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	100	106	0	0	0	0	0	206	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								c0.06				
v/s Ratio Perm	0.06	0.07										
v/c Ratio	0.08	0.09						0.37				
Uniform Delay, d1	2.8	2.8						36.7				
Progression Factor	0.09	0.14						1.17				
Incremental Delay, d2	0.1	0.1						1.6				
Delay (s)	0.4	0.5						44.5				
Level of Service	A	A						D				
Approach Delay (s)		0.5			0.0			44.5			0.0	
Approach LOS		A			A			D			A	
Intersection Summary												
HCM Average Control Delay	19.7					HCM Level of Service			B			
HCM Volume to Capacity ratio	0.14											
Actuated Cycle Length (s)	100.0					Sum of lost time (s)			6.0			
Intersection Capacity Utilization	32.4%					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				
Frt		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	1414	0	0	3108	0	93	325	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	1571	0	0	3453	0	103	361	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1571	0	0	3453	0	0	464	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	0.32			c0.70			c0.14					
v/s Ratio Perm												
v/c Ratio	0.52			1.13			0.44					
Uniform Delay, d1	10.6			19.0			26.9					
Progression Factor	0.10			0.52			0.98					
Incremental Delay, d2	0.5			60.2			1.3					
Delay (s)	1.6			70.1			27.9					
Level of Service	A			E			C					
Approach Delay (s)	1.6			70.1			27.9			0.0		
Approach LOS	A			E			C			A		
Intersection Summary												
HCM Average Control Delay	46.9			HCM Level of Service			D					
HCM Volume to Capacity ratio	0.90											
Actuated Cycle Length (s)	100.0			Sum of lost time (s)			6.0					
Intersection Capacity Utilization	78.4%			ICU Level of Service			D					
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	1414	0	0	3108	111	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	1571	0	0	3453	123	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				0.82			0.82	0.82	0.82	0.82
vC, conflicting volume	3577			1571			4045	5086	5148	524
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	3577			1263			4271	5536	5611	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)	66			449			0	0	0	892
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NE 1			
Volume Total	524	524	524	1381	1381	814	7			
Volume Left	0	0	0	0	0	0	0			
Volume Right	0	0	0	0	0	123	7			
cSH	1700	1700	1700	1700	1700	1700	892			
Volume to Capacity	0.31	0.31	0.31	0.81	0.81	0.48	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	9.1			
Lane LOS							A			
Approach Delay (s)	0.0			0.0			9.1			
Approach LOS							A			
Intersection Summary										
Average Delay			0.0							
Intersection Capacity Utilization			65.9%			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)	42	0	0	0	0	0	0	503	28	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)	47	0	0	0	0	0	0	559	31	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	279	590	0	590			0			574	574
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	279	590	0	590			0			574	574
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 %	93	100	100	100			100			100	100
cM capacity (veh/h)	651	419	1084	982			1622			401	427
Direction, Lane #	WB 1	WB 2	SB 1	SB 2							
Volume Total	23	23	373	217							
Volume Left	23	23	0	0							
Volume Right	0	0	0	31							
cSH	651	651	1700	1700							
Volume to Capacity	0.04	0.04	0.22	0.13							
Queue Length 95th (ft)	3	3	0	0							
Control Delay (s)	10.7	10.7	0.0	0.0							
Lane LOS	B	B									
Approach Delay (s)	10.7		0.0								
Approach LOS	B										
Intersection Summary											
Average Delay			0.8								
Intersection Capacity Utilization			24.8%			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	42	69	325	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	47	77	361	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	0.90	0.90		0.90	0.90	0.90	0.90				
vC, conflicting volume	281	361	0	361	361	181	361				
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	98	187	0	187	187	0	187				
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	93	92	100				
cM capacity (veh/h)	687	639	1084	684	639	980	1252				
Direction, Lane #	WB 1	NB 1	NB 2								
Volume Total	123	120	241								
Volume Left	0	0	0								
Volume Right	77	0	0								
cSH	815	1622	1700								
Volume to Capacity	0.15	0.00	0.14								
Queue Length 95th (ft)	13	0	0								
Control Delay (s)	10.2	0.0	0.0								
Lane LOS	B										
Approach Delay (s)	10.2	0.0									
Approach LOS	B										
Intersection Summary											
Average Delay	2.6										
Intersection Capacity Utilization	22.4%			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)	4910			4915			1512			1826		
Flt Permitted	0.94			0.90			0.99			0.93		
Satd. Flow (perm)	4614			4442			1497			1723		
Volume (vph)	1	2995	22	5	1562	0	3	0	52	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	3328	24	6	1736	0	3	0	58	3	3	2
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	3353	0	0	1742	0	0	60	0	0	6	0
Confl. Peds. (#/hr)	1		10	10		1						
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases	2			2			4			4		
Permitted Phases	2			2			4			4		
Actuated Green, G (s)	100.3			100.3			8.7			8.7		
Effective Green, g (s)	102.3			102.3			11.7			11.7		
Actuated g/C Ratio	0.85			0.85			0.10			0.10		
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)	3933			3787			146			168		
v/s Ratio Prot												
v/s Ratio Perm	c0.73			0.39			c0.04			0.00		
v/c Ratio	0.85			0.46			0.41			0.04		
Uniform Delay, d1	4.8			2.1			50.9			49.0		
Progression Factor	1.00			2.36			1.00			1.00		
Incremental Delay, d2	2.5			0.4			1.9			0.1		
Delay (s)	7.3			5.4			52.8			49.1		
Level of Service	A			A			D			D		
Approach Delay (s)	7.3			5.4			52.8			49.1		
Approach LOS	A			A			D			D		
Intersection Summary												
HCM Average Control Delay	7.3			HCM Level of Service			A					
HCM Volume to Capacity ratio	0.81											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			6.0					
Intersection Capacity Utilization	73.2%			ICU Level of Service			D					
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
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	4908		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	4908		3204	4897			3242	1393		3164	1345
Volume (vph)	294	3347	38	234	1603	41	0	486	414	0	443	212
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)	327	3719	42	260	1781	46	0	540	460	0	492	236
RTOR Reduction (vph)	0	1	0	0	2	0	0	4	0	0	0	2
Lane Group Flow (vph)	327	3760	0	260	1825	0	0	578	418	0	492	234
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	3272		294	2122			540	395		527	695
v/s Ratio Prot	0.10	c0.77		0.08	0.37			0.18	c0.10		0.16	0.11
v/s Ratio Perm									0.20			0.06
v/c Ratio	0.31	1.15		0.88	0.86			1.07	1.06		0.93	0.34
Uniform Delay, d1	30.4	20.0		53.9	30.7			50.0	44.5		49.3	18.6
Progression Factor	0.80	0.71		1.00	1.00			1.00	1.00		0.74	0.92
Incremental Delay, d2	0.1	67.5		29.8	4.8			58.8	61.5		24.9	1.2
Delay (s)	24.5	81.7		83.7	35.5			108.8	106.0		61.4	18.4
Level of Service	C	F		F	D			F	F		E	B
Approach Delay (s)		77.1			41.5			107.6			47.4	
Approach LOS		E			D			F			D	

Intersection Summary

HCM Average Control Delay	68.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	100.0%	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			3083		1486	3122	
Flt Permitted		0.72			0.86			0.59		0.21	1.00	
Satd. Flow (perm)		2339			2692			1817		331	3122	
Volume (vph)	88	844	56	14	496	116	40	612	64	269	228	7
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)	98	938	62	16	551	129	44	680	71	299	253	8
RTOR Reduction (vph)	0	4	0	0	20	0	0	7	0	0	2	0
Lane Group Flow (vph)	0	1094	0	0	676	0	0	788	0	299	259	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)		936			1077			709		307	1686	
v/s Ratio Prot										c0.12	0.08	
v/s Ratio Perm		c0.47			0.25			c0.43		0.38		
v/c Ratio		1.17			0.63			1.11		0.97	0.15	
Uniform Delay, d1		30.0			24.0			30.5		18.1	11.5	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		87.4			2.8			68.5		45.2	0.2	
Delay (s)		117.4			26.8			99.0		63.3	11.7	
Level of Service		F			C			F		E	B	
Approach Delay (s)		117.4			26.8			99.0			39.3	
Approach LOS		F			C			F			D	
Intersection Summary												
HCM Average Control Delay		78.8			HCM Level of Service					E		
HCM Volume to Capacity ratio		1.12										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)					9.0		
Intersection Capacity Utilization		122.4%			ICU Level of Service					H		
Analysis Period (min)		15										
c Critical Lane Group												

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	158	8	36	199	1	11	1	30	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	176	9	40	221	1	12	1	33	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	230				195				494	501	191	524
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	230				195				494	501	191	524
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1
tC, 2 stage (s)												
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5
p0 queue free %	100				97				97	100	96	100
cM capacity (veh/h)	1330				1367				466	452	844	428
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	184	262	47	1								
Volume Left	0	40	12	0								
Volume Right	9	1	33	1								
cSH	1330	1367	685	805								
Volume to Capacity	0.00	0.03	0.07	0.00								
Queue Length 95th (ft)	0	2	5	0								
Control Delay (s)	0.0	1.4	10.6	9.5								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	1.4	10.6	9.5								
Approach LOS			B	A								
Intersection Summary												
Average Delay				1.8								
Intersection Capacity Utilization				42.1%	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		1661			4837			4818	
Flt Permitted		0.83	1.00		0.89			0.70			0.91	
Satd. Flow (perm)		1352	1378		1501			3413			4408	
Volume (vph)	32	24	133	26	27	13	143	953	11	11	685	88
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)	36	27	148	29	30	14	159	1059	12	12	761	98
RTOR Reduction (vph)	0	0	114	0	8	0	0	1	0	0	16	0
Lane Group Flow (vph)	0	63	34	0	65	0	0	1229	0	0	855	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)		311	317		345			2708			2116	
v/s Ratio Prot								c0.09				
v/s Ratio Perm		c0.05	0.02		0.04			c0.23			0.19	
v/c Ratio		0.20	0.11		0.19			0.45			0.40	
Uniform Delay, d1		31.1	30.4		31.0			6.2			16.8	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		1.5	0.7		1.2			0.6			0.6	
Delay (s)		32.6	31.1		32.2			6.8			17.3	
Level of Service		C	C		C			A			B	
Approach Delay (s)		31.5			32.2			6.8			17.3	
Approach LOS		C			C			A			B	

Intersection Summary												
HCM Average Control Delay		13.6		HCM Level of Service						B		
HCM Volume to Capacity ratio		0.39										
Actuated Cycle Length (s)		100.0		Sum of lost time (s)				6.0				
Intersection Capacity Utilization		114.5%		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	0.99	
Flt Protected	0.98			0.99	1.00	
Satd. Flow (prot)	1640			4715	4684	
Flt Permitted	0.98			0.75	1.00	
Satd. Flow (perm)	1640			3582	4684	
Volume (vph)	123	118	100	650	601	58
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	137	131	111	722	668	64
RTOR Reduction (vph)	29	0	0	0	10	0
Lane Group Flow (vph)	239	0	0	833	722	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			2816	2537	
v/s Ratio Prot	c0.15			c0.05	0.15	
v/s Ratio Perm				c0.17		
v/c Ratio	0.67			0.30	0.28	
Uniform Delay, d1	43.1			5.4	14.9	
Progression Factor	1.00			0.39	1.00	
Incremental Delay, d2	9.8			0.2	0.3	
Delay (s)	52.9			2.3	15.2	
Level of Service	D			A	B	
Approach Delay (s)	52.9			2.3	15.2	
Approach LOS	D			A	B	
Intersection Summary						
HCM Average Control Delay	14.8			HCM Level of Service		B
HCM Volume to Capacity ratio	0.38					
Actuated Cycle Length (s)	120.0			Sum of lost time (s)		6.0
Intersection Capacity Utilization	51.5%			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	3357	1692	0	0	30	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly flow rate (vph)	0	3730	1880	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	0.88				0.24	0.88	
vC, conflicting volume	1880				3123	627	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1721				1205	289	
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	95	
cM capacity (veh/h)	318				43	619	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SW 1
Volume Total	1243	1243	1243	627	627	627	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	619
Volume to Capacity	0.73	0.73	0.73	0.37	0.37	0.37	0.05
Queue Length 95th (ft)	0	0	0	0	0	0	4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.1
Lane LOS							B
Approach Delay (s)	0.0			0.0			11.1
Approach LOS							B
Intersection Summary							
Average Delay			0.1				
Intersection Capacity Utilization			68.2%		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)	3293	64	1692	179	136	317
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	3659	71	1880	199	151	352
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	3730	0	1880	0	0	702
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	c0.76		c0.38			
v/s Ratio Perm						0.20
v/c Ratio	1.45		0.48			1.36
Uniform Delay, d1	28.5		3.9			51.0
Progression Factor	0.86		0.05			1.00
Incremental Delay, d2	203.5		0.3			172.2
Delay (s)	228.1		0.5			223.2
Level of Service	F		A			F
Approach Delay (s)	228.1		0.5			223.2
Approach LOS	F		A			F
Intersection Summary						
HCM Average Control Delay			159.8		HCM Level of Service	F
HCM Volume to Capacity ratio			1.15			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	6.0
Intersection Capacity Utilization			89.6%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

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

3011 Abdo New York Avenue
4/20/2006



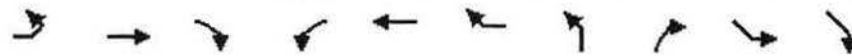
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑						↓↓			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)		3.0						3.0			
Lane Util. Factor		0.95						0.97			
Frt		1.00						1.00			
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	479	0	0	0	0	32	168	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	532	0	0	0	0	36	187	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	12	0	0	0
Lane Group Flow (vph)	0	532	0	0	0	0	0	211	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		c0.16						c0.07			
v/s Ratio Perm											
v/c Ratio		0.57						0.10			
Uniform Delay, d1		36.7						7.1			
Progression Factor		1.00						1.09			
Incremental Delay, d2		2.5						0.0			
Delay (s)		39.2						7.8			
Level of Service		D						A			
Approach Delay (s)		39.2			0.0			7.8		0.0	
Approach LOS		D			A			A		A	
Intersection Summary											
HCM Average Control Delay		29.9					HCM Level of Service		C		
HCM Volume to Capacity ratio		0.24									
Actuated Cycle Length (s)		120.0					Sum of lost time (s)		6.0		
Intersection Capacity Utilization		28.8%					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						3283				
Flt Permitted	0.95	0.96						1.00				
Satd. Flow (perm)	1569	1585						3283				
Volume (vph)	470	41	0	0	0	0	0	192	8	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)	522	46	0	0	0	0	0	213	9	0	0	0
RTOR Reduction (vph)	9	9	0	0	0	0	0	3	0	0	0	0
Lane Group Flow (vph)	268	282	0	0	0	0	0	219	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	0.17	0.18										
v/c Ratio	0.20	0.21						0.67				
Uniform Delay, d1	1.6	1.6						52.1				
Progression Factor	0.48	0.66						1.00				
Incremental Delay, d2	0.3	0.3						10.4				
Delay (s)	1.1	1.4						62.4				
Level of Service	A	A						E				
Approach Delay (s)		1.2			0.0			62.4			0.0	
Approach LOS		A			A			E			A	
Intersection Summary												
HCM Average Control Delay		18.4						HCM Level of Service		B		
HCM Volume to Capacity ratio		0.26										
Actuated Cycle Length (s)		120.0						Sum of lost time (s)		6.0		
Intersection Capacity Utilization		48.4%						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			3279				
Flt Permitted		1.00			1.00			0.99				
Satd. Flow (perm)		4916			4916			3279				
Volume (vph)	0	3472	0	0	1596	0	96	566	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	3858	0	0	1773	0	107	629	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	3858	0	0	1773	0	0	736	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			1202				
v/s Ratio Prot		c0.78			0.36			c0.22				
v/s Ratio Perm												
v/c Ratio		1.35			0.62			0.61				
Uniform Delay, d1		25.0			16.3			31.0				
Progression Factor		0.09			0.36			1.50				
Incremental Delay, d2		155.6			0.6			2.2				
Delay (s)		157.9			6.5			48.7				
Level of Service		F			A			D				
Approach Delay (s)		157.9			6.5			48.7			0.0	
Approach LOS		F			A			D			A	
Intersection Summary												
HCM Average Control Delay		103.1			HCM Level of Service			F				
HCM Volume to Capacity ratio		1.06										
Actuated Cycle Length (s)		120.0			Sum of lost time (s)			6.0				
Intersection Capacity Utilization		92.2%			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	3472	0	0	1596	194	0	0	0	49
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	3858	0	0	1773	216	0	0	0	54
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	1989			3858			3221	5739	5847	1286
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	1989			5038			3526	9508	9764	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	88
cM capacity (veh/h)	286			7			1	0	0	456
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NE 1			
Volume Total	1286	1286	1286	709	709	570	54			
Volume Left	0	0	0	0	0	0	0			
Volume Right	0	0	0	0	0	216	54			
cSH	1700	1700	1700	1700	1700	1700	456			
Volume to Capacity	0.76	0.76	0.76	0.42	0.42	0.34	0.12			
Queue Length 95th (ft)	0	0	0	0	0	0	10			
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			77.1%			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		Yield	
Grade	0%			0%				0%		0%	
Volume (veh/h)	11	0	0	0	0	0	0	621	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)	12	0	0	0	0	0	0	690	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	345	723	0	723				0	707 707		
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	345	723	0	723				0	707 707		
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)	585	351	1084	875				1622	322 359		
Direction, Lane #	WB 1	WB 2	SB 1	SB 2							
Volume Total	6	6	460	263							
Volume Left	6	6	0	0							
Volume Right	0	0	0	33							
cSH	585	585	1700	1700							
Volume to Capacity	0.01	0.01	0.27	0.15							
Queue Length 95th (ft)	1	1	0	0							
Control Delay (s)	11.2	11.2	0.0	0.0							
Lane LOS	B	B									
Approach Delay (s)	11.2			0.0							
Approach LOS	B										
Intersection Summary											
Average Delay				0.2							
Intersection Capacity Utilization				28.1%	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	11	183	566	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	12	203	629	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	0.83	0.83		0.83	0.83	0.83			0.83	
vC, conflicting volume	524	629	0	629	629	314			629	
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	212	339	0	339	339	0			339	
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	77			100	
cM capacity (veh/h)	455	480	1084	488	480	895			1005	
Direction, Lane #	WB 1	NB 1	NB 2							
Volume Total	216	210	419							
Volume Left	0	0	0							
Volume Right	203	0	0							
cSH	853	1622	1700							
Volume to Capacity	0.25	0.00	0.25							
Queue Length 95th (ft)	25	0	0							
Control Delay (s)	10.6	0.0	0.0							
Lane LOS	B									
Approach Delay (s)	10.6	0.0								
Approach LOS	B									
Intersection Summary										
Average Delay		2.7								
Intersection Capacity Utilization		34.7%		ICU Level of Service					A	
Analysis Period (min)		15								