

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	15	105	613	294
v/c Ratio	0.09	0.51	0.60	0.23
Control Delay	27.7	36.9	5.9	6.1
Queue Delay	0.0	0.0	0.1	0.0
Total Delay	27.7	36.9	6.1	6.1
Queue Length 50th (ft)	4	42	45	63
Queue Length 95th (ft)	21	92	88	89
Internal Link Dist (ft)	690	766	403	656
Turn Bay Length (ft)				
Base Capacity (vph)	164	205	1021	1265
Starvation Cap Reductn	0	0	44	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.09	0.51	0.63	0.23
Intersection Summary				

HCM Signalized Intersection Capacity Analysis
 11: 4th St NW/5th St NW & Howard PI NW/McMillan Dr NW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	4	1	8	43	1	45	8	491	22	1	244	5
Future Volume (vph)	4	1	8	43	1	45	8	491	22	1	244	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	8	8	8	12	12	12	12	12	8	15	15	8
Grade (%)		-13%			6%			6%			0%	
Total Lost time (s)		5.0			5.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.88			0.98			1.00			1.00	
Flpb, ped/bikes		1.00			0.91			1.00			1.00	
Frt		0.92			0.93			0.99			1.00	
Flt Protected		0.98			0.98			1.00			1.00	
Satd. Flow (prot)		1098			1302			1445			1786	
Flt Permitted		0.91			0.84			1.00			1.00	
Satd. Flow (perm)		1012			1118			1439			1785	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	5	1	9	51	1	53	9	578	26	1	287	6
RTOR Reduction (vph)	0	8	0	0	33	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	7	0	0	72	0	0	612	0	0	293	0
Confl. Peds. (#/hr)	4		45	45		4	2		14	14		2
Heavy Vehicles (%)	2%	2%	2%	5%	2%	2%	2%	2%	9%	2%	5%	2%
Parking (#/hr)		0						0				
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			6			2	
Permitted Phases	4			4			6			2		
Actuated Green, G (s)		15.0			15.0			76.0			76.0	
Effective Green, g (s)		17.0			17.0			78.0			78.0	
Actuated g/C Ratio		0.15			0.15			0.71			0.71	
Clearance Time (s)		7.0			7.0			6.0			6.0	
Lane Grp Cap (vph)		156			172			1020			1265	
v/s Ratio Prot												
v/s Ratio Perm		0.01			0.06			0.42			0.16	
v/c Ratio		0.05			0.42			0.60			0.23	
Uniform Delay, d1		39.6			42.0			8.1			5.6	
Progression Factor		1.00			1.00			0.45			1.00	
Incremental Delay, d2		0.6			7.3			2.2			0.4	
Delay (s)		40.2			49.4			5.8			6.0	
Level of Service		D			D			A			A	
Approach Delay (s)		40.2			49.4			5.8			6.0	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	55.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues
12: Sherman Ave NW & Barry PI NW



Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	312	122	23	27	376	65	43	481
v/c Ratio	0.69	0.27	0.06	0.07	0.40	0.10	0.12	0.27
Control Delay	38.9	26.5	8.3	11.5	15.2	3.1	12.3	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.9	26.5	8.3	11.5	15.2	3.1	12.3	12.5
Queue Length 50th (ft)	184	60	0	8	142	0	13	84
Queue Length 95th (ft)	292	107	17	22	210	19	32	115
Internal Link Dist (ft)	139	246			167			404
Turn Bay Length (ft)			100	110		100	95	
Base Capacity (vph)	451	448	382	398	935	647	369	1800
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.27	0.06	0.07	0.40	0.10	0.12	0.27
Intersection Summary								

HCM Signalized Intersection Capacity Analysis
 12: Sherman Ave NW & Barry PI NW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕↕			↕	↕	↕	↑	↕	↕	↕↕		
Traffic Volume (vph)	142	153	5	36	81	22	26	361	62	41	428	34	
Future Volume (vph)	142	153	5	36	81	22	26	361	62	41	428	34	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	12	12	12	9	9	12	12	12	10	12	10	
Grade (%)		-1%			3%			0%				-3%	
Total Lost time (s)		4.0			4.0	4.0	3.5	3.5	3.5	3.5	3.5		
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	0.95		
Frbp, ped/bikes		1.00			1.00	0.84	1.00	1.00	0.83	1.00	1.00		
Flpb, ped/bikes		0.95			0.99	1.00	0.95	1.00	1.00	0.94	1.00		
Frt		1.00			1.00	0.85	1.00	1.00	0.85	1.00	0.99		
Flt Protected		0.98			0.98	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)		1549			1410	996	1513	1660	1099	1359	3186		
Flt Permitted		0.77			0.85	1.00	0.44	1.00	1.00	0.46	1.00		
Satd. Flow (perm)		1225			1218	996	707	1660	1099	656	3186		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	148	159	5	38	84	23	27	376	65	43	446	35	
RTOR Reduction (vph)	0	1	0	0	0	15	0	0	28	0	5	0	
Lane Group Flow (vph)	0	311	0	0	122	8	27	376	37	43	476	0	
Confl. Peds. (#/hr)	51		59	59		51	26		33	33		26	
Heavy Vehicles (%)	2%	2%	2%	3%	5%	9%	2%	3%	10%	7%	2%	3%	
Parking (#/hr)												0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA		
Protected Phases		4			8			2			6		
Permitted Phases	4			8		8	2		2	6			
Actuated Green, G (s)		38.5			38.5	38.5	60.0	60.0	60.0	60.0	60.0		
Effective Green, g (s)		40.5			40.5	40.5	62.0	62.0	62.0	62.0	62.0		
Actuated g/C Ratio		0.37			0.37	0.37	0.56	0.56	0.56	0.56	0.56		
Clearance Time (s)		6.0			6.0	6.0	5.5	5.5	5.5	5.5	5.5		
Lane Grp Cap (vph)		451			448	366	398	935	619	369	1795		
v/s Ratio Prot								c0.23			0.15		
v/s Ratio Perm		c0.25			0.10	0.01	0.04		0.03	0.07			
v/c Ratio		0.69			0.27	0.02	0.07	0.40	0.06	0.12	0.27		
Uniform Delay, d1		29.4			24.4	22.1	10.9	13.5	10.8	11.2	12.3		
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2		8.4			1.5	0.1	0.3	1.3	0.2	0.6	0.4		
Delay (s)		37.8			25.9	22.3	11.2	14.8	11.0	11.9	12.7		
Level of Service		D			C	C	B	B	B	B	B		
Approach Delay (s)		37.8			25.3			14.1			12.6		
Approach LOS		D			C			B			B		
Intersection Summary													
HCM 2000 Control Delay			19.8		HCM 2000 Level of Service					B			
HCM 2000 Volume to Capacity ratio			0.52										
Actuated Cycle Length (s)			110.0		Sum of lost time (s)					7.5			
Intersection Capacity Utilization			65.9%		ICU Level of Service					C			
Analysis Period (min)			15										

c Critical Lane Group

Queues
13: Georgia Ave NW & Barry PI NW



Lane Group	EBL	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	243	48	704	741	116
v/c Ratio	0.99	0.16	0.69	0.87	0.32
Control Delay	94.7	3.1	4.7	29.8	3.5
Queue Delay	0.0	0.0	0.3	0.0	0.0
Total Delay	94.7	3.1	5.0	29.8	3.5
Queue Length 50th (ft)	156	3	38	435	0
Queue Length 95th (ft)	#324	m3	m51	#697	16
Internal Link Dist (ft)	494		293	410	
Turn Bay Length (ft)		125			
Base Capacity (vph)	245	304	1022	851	365
Starvation Cap Reductn	0	0	53	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.99	0.16	0.73	0.87	0.32

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 13: Georgia Ave NW & Barry PI NW



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	140	86	45	655	689	108
Future Volume (vph)	140	86	45	655	689	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	10	10	10	10
Grade (%)	4%			3%	-5%	
Total Lost time (s)	3.0		3.0	3.0	3.0	3.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.78		1.00	1.00	1.00	0.43
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.95		1.00	1.00	1.00	0.85
Flt Protected	0.97		0.95	1.00	1.00	1.00
Satd. Flow (prot)	993		1464	1541	1588	581
Flt Permitted	0.97		0.18	1.00	1.00	1.00
Satd. Flow (perm)	993		280	1541	1588	581
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	151	92	48	704	741	116
RTOR Reduction (vph)	20	0	0	0	0	54
Lane Group Flow (vph)	223	0	48	704	741	62
Confl. Peds. (#/hr)	165	259	128			128
Heavy Vehicles (%)	7%	2%	2%	2%	3%	4%
Parking (#/hr)	0	0				
Turn Type	Prot		pm+pt	NA	NA	Perm
Protected Phases	8		5	2	6	
Permitted Phases			2			6
Actuated Green, G (s)	23.0		71.0	71.0	57.0	57.0
Effective Green, g (s)	25.0		73.0	73.0	59.0	59.0
Actuated g/C Ratio	0.23		0.66	0.66	0.54	0.54
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	225		304	1022	851	311
v/s Ratio Prot	c0.22		0.02	c0.46	c0.47	
v/s Ratio Perm			0.09			0.11
v/c Ratio	0.99		0.16	0.69	0.87	0.20
Uniform Delay, d1	42.4		24.0	11.5	22.2	13.2
Progression Factor	1.00		0.31	0.24	0.79	0.55
Incremental Delay, d2	57.7		0.5	1.8	11.0	1.3
Delay (s)	100.1		7.9	4.5	28.5	8.5
Level of Service	F		A	A	C	A
Approach Delay (s)	100.1			4.7	25.8	
Approach LOS	F			A	C	

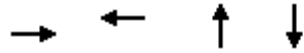
Intersection Summary			
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 14: 6th St NW & College St NW



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰					↱
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	38	0	0	0	27	71
Future Volume (vph)	38	0	0	0	27	71
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	0	0	0	29	77
Direction, Lane #	WB 1	SB 1				
Volume Total (vph)	41	106				
Volume Left (vph)	41	29				
Volume Right (vph)	0	0				
Hadj (s)	0.23	0.11				
Departure Headway (s)	4.4	4.1				
Degree Utilization, x	0.05	0.12				
Capacity (veh/h)	800	857				
Control Delay (s)	7.6	7.7				
Approach Delay (s)	7.6	7.7				
Approach LOS	A	A				
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			32.7%		ICU Level of Service	A
Analysis Period (min)			15			



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	60	7	608	384
v/c Ratio	0.33	0.03	0.60	0.35
Control Delay	29.0	26.5	5.6	5.7
Queue Delay	0.0	0.0	0.0	0.2
Total Delay	29.0	26.5	5.7	5.9
Queue Length 50th (ft)	20	2	78	72
Queue Length 95th (ft)	56	13	m131	94
Internal Link Dist (ft)	696	244	287	403
Turn Bay Length (ft)				
Base Capacity (vph)	183	220	1016	1091
Starvation Cap Reductn	0	0	12	237
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.33	0.03	0.61	0.45

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 15: 4th St NW & College St NW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	28	1	22	2	1	3	32	483	2	1	312	14
Future Volume (vph)	28	1	22	2	1	3	32	483	2	1	312	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			6%			-8%	
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.74			0.90			1.00			0.98	
Flpb, ped/bikes		0.87			0.86			0.98			1.00	
Frt		0.94			0.92			1.00			0.99	
Flt Protected		0.97			0.99			1.00			1.00	
Satd. Flow (prot)		875			1069			1434			1482	
Flt Permitted		0.87			0.96			0.96			1.00	
Satd. Flow (perm)		781			1041			1380			1481	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	33	1	26	2	1	4	38	568	2	1	367	16
RTOR Reduction (vph)	0	21	0	0	3	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	39	0	0	4	0	0	608	0	0	383	0
Confl. Peds. (#/hr)	63		247	247		63	158		195	195		158
Heavy Vehicles (%)	4%	2%	2%	2%	2%	2%	3%	2%	2%	2%	5%	2%
Parking (#/hr)		0			0			0			0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		21.0			21.0			79.0			79.0	
Effective Green, g (s)		23.0			23.0			81.0			81.0	
Actuated g/C Ratio		0.21			0.21			0.74			0.74	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		163			217			1016			1090	
v/s Ratio Prot												
v/s Ratio Perm		c0.05			0.00			c0.44			0.26	
v/c Ratio		0.24			0.02			0.60			0.35	
Uniform Delay, d1		36.2			34.5			6.8			5.2	
Progression Factor		1.00			1.00			0.48			0.91	
Incremental Delay, d2		3.5			0.1			2.1			0.9	
Delay (s)		39.7			34.7			5.4			5.6	
Level of Service		D			C			A			A	
Approach Delay (s)		39.7			34.7			5.4			5.6	
Approach LOS		D			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.6									A
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			110.0							6.0		
Intersection Capacity Utilization			71.6%									C
Analysis Period (min)			15									

c Critical Lane Group

Queues
16: Georgia Ave NW & Bryant St NW



Lane Group	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	757	118	149	609
v/c Ratio	0.87	0.33	0.36	0.52
Control Delay	22.7	11.4	6.5	1.2
Queue Delay	2.2	0.0	0.0	0.4
Total Delay	24.9	11.4	6.5	1.6
Queue Length 50th (ft)	164	24	1	6
Queue Length 95th (ft)	#702	m41	m2	m11
Internal Link Dist (ft)	279			293
Turn Bay Length (ft)		100	125	
Base Capacity (vph)	869	356	418	1171
Starvation Cap Reductn	43	0	0	192
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.92	0.33	0.36	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 16: Georgia Ave NW & Bryant St NW



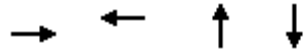
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑	↗	↘	↑
Traffic Volume (vph)	0	0	727	113	143	585
Future Volume (vph)	0	0	727	113	143	585
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10
Grade (%)	0%		2%			-3%
Total Lost time (s)			3.5	3.5	3.0	3.5
Lane Util. Factor			1.00	1.00	1.00	1.00
Frbp, ped/bikes			1.00	0.48	1.00	1.00
Flpb, ped/bikes			1.00	1.00	1.00	1.00
Frt			1.00	0.85	1.00	1.00
Flt Protected			1.00	1.00	0.95	1.00
Satd. Flow (prot)			1519	622	1509	1543
Flt Permitted			1.00	1.00	0.19	1.00
Satd. Flow (perm)			1519	622	295	1543
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	757	118	149	609
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	757	118	149	609
Confl. Peds. (#/hr)	41	88		118	118	
Heavy Vehicles (%)	2%	2%	4%	4%	2%	5%
Turn Type			NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases				2	6	
Actuated Green, G (s)			61.0	61.0	81.5	81.5
Effective Green, g (s)			63.0	63.0	83.5	83.5
Actuated g/C Ratio			0.57	0.57	0.76	0.76
Clearance Time (s)			5.5	5.5	5.0	5.5
Vehicle Extension (s)			1.0	1.0	1.0	1.0
Lane Grp Cap (vph)			869	356	417	1171
v/s Ratio Prot			c0.50		0.06	c0.39
v/s Ratio Perm				0.19	0.21	
v/c Ratio			0.87	0.33	0.36	0.52
Uniform Delay, d1			20.0	12.4	10.4	5.3
Progression Factor			0.60	0.72	1.58	0.08
Incremental Delay, d2			9.3	1.9	1.1	0.7
Delay (s)			21.3	10.9	17.5	1.2
Level of Service			C	B	B	A
Approach Delay (s)	0.0		19.9			4.4
Approach LOS	A		B			A
Intersection Summary						
HCM 2000 Control Delay			12.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.65			
Actuated Cycle Length (s)			110.0		Sum of lost time (s)	10.5
Intersection Capacity Utilization			74.1%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis
 17: 6th St NW & Bryant St NW

Howard University CMP
 11/24/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻							↻		↻	
Traffic Volume (veh/h)	0	244	23	0	0	0	0	0	37	43	57	0
Future Volume (Veh/h)	0	244	23	0	0	0	0	0	37	43	57	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	287	27	0	0	0	0	0	44	51	67	0
Pedestrians		57			67			95			163	
Lane Width (ft)		12.0			0.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		5			0			8			14	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		339			770							
pX, platoon unblocked												
vC, conflicting volume	163			409			486	558	462	574	572	220
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	163			409			486	558	462	574	572	220
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			100			100	100	92	82	80	100
cM capacity (veh/h)	1223			1059			311	348	552	288	342	675
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	314	44	118									
Volume Left	0	0	51									
Volume Right	27	44	0									
cSH	1700	552	316									
Volume to Capacity	0.18	0.08	0.37									
Queue Length 95th (ft)	0	6	42									
Control Delay (s)	0.0	12.1	23.0									
Lane LOS		B	C									
Approach Delay (s)	0.0	12.1	23.0									
Approach LOS		B	C									
Intersection Summary												
Average Delay			6.8									
Intersection Capacity Utilization			51.2%		ICU Level of Service				A			
Analysis Period (min)			15									



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	361	126	452	373
v/c Ratio	0.95	0.41	0.57	0.55
Control Delay	62.1	15.7	1.6	15.0
Queue Delay	0.0	0.0	0.6	0.5
Total Delay	62.1	15.8	2.2	15.6
Queue Length 50th (ft)	242	23	0	75
Queue Length 95th (ft)	#438	79	m0	206
Internal Link Dist (ft)	690	359	289	287
Turn Bay Length (ft)				
Base Capacity (vph)	379	305	794	677
Starvation Cap Reductn	0	0	105	82
Spillback Cap Reductn	0	2	0	31
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.95	0.42	0.66	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 18: 4th St NW & Bryant St NW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	73	197	55	44	0	69	0	383	23	51	284	0
Future Volume (vph)	73	197	55	44	0	69	0	383	23	51	284	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	14	14	14	11	11	8	11	11	8
Grade (%)		0%			0%			5%			-8%	
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.91			0.65			0.96			1.00	
Flpb, ped/bikes		0.92			1.00			1.00			1.00	
Frt		0.98			0.92			0.99			1.00	
Flt Protected		0.99			0.98			1.00			0.99	
Satd. Flow (prot)		1125			896			1503			1468	
Flt Permitted		0.90			0.77			1.00			0.87	
Satd. Flow (perm)		1028			705			1503			1285	
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)	81	219	61	49	0	77	0	426	26	57	316	0
RTOR Reduction (vph)	0	6	0	0	49	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	355	0	0	77	0	0	450	0	0	373	0
Confl. Peds. (#/hr)	175		150	150		175	74		253	253		74
Heavy Vehicles (%)	3%	2%	6%	10%	2%	6%	2%	2%	2%	8%	4%	2%
Parking (#/hr)		0			0						0	
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Actuated Green, G (s)		38.0			38.0			56.0			56.0	
Effective Green, g (s)		40.0			40.0			58.0			58.0	
Actuated g/C Ratio		0.36			0.36			0.53			0.53	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		373			256			792			677	
v/s Ratio Prot								c0.30				
v/s Ratio Perm		c0.35			0.11						0.29	
v/c Ratio		0.95			0.30			0.57			0.55	
Uniform Delay, d1		34.0			25.0			17.5			17.3	
Progression Factor		0.73			1.00			0.00			0.67	
Incremental Delay, d2		35.4			3.0			1.6			3.1	
Delay (s)		60.2			28.0			1.6			14.6	
Level of Service		E			C			A			B	
Approach Delay (s)		60.2			28.0			1.6			14.6	
Approach LOS		E			C			A			B	
Intersection Summary												
HCM 2000 Control Delay			24.0									C
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			110.0						10.0			
Intersection Capacity Utilization			77.5%									D
Analysis Period (min)			15									

c Critical Lane Group

Queues
19: Georgia Ave NW & Driveway/W St NW



Lane Group	EBT	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	2	138	185	716	621
v/c Ratio	0.01	0.46	0.41	0.70	0.60
Control Delay	0.0	33.9	6.4	10.5	3.3
Queue Delay	0.0	0.0	0.1	0.7	0.1
Total Delay	0.0	33.9	6.5	11.1	3.4
Queue Length 50th (ft)	0	71	4	120	35
Queue Length 95th (ft)	0	m120	m39	328	52
Internal Link Dist (ft)	74			370	279
Turn Bay Length (ft)			190		
Base Capacity (vph)	399	300	447	1027	1032
Starvation Cap Reductn	0	0	0	32	30
Spillback Cap Reductn	0	0	10	94	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.46	0.42	0.77	0.62

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 19: Georgia Ave NW & Driveway/W St NW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↖		↗		↑			↑	
Traffic Volume (vph)	1	0	1	131	0	176	0	680	0	0	590	0
Future Volume (vph)	1	0	1	131	0	176	0	680	0	0	590	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	10	12	10	12	10	10	10	10	12
Grade (%)		0%			1%			1%				-2%
Total Lost time (s)		3.0		3.0		3.0		3.5			3.5	
Lane Util. Factor		1.00		1.00		1.00		1.00			1.00	
Frbp, ped/bikes		0.97		1.00		0.91		1.00			1.00	
Flpb, ped/bikes		0.97		0.95		1.00		1.00			1.00	
Frt		0.93		1.00		0.85		1.00			1.00	
Flt Protected		0.98		0.95		1.00		1.00			1.00	
Satd. Flow (prot)		1424		1407		1209		1527			1535	
Flt Permitted		0.98		0.76		1.00		1.00			1.00	
Satd. Flow (perm)		1424		1121		1209		1527			1535	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	0	1	138	0	185	0	716	0	0	621	0
RTOR Reduction (vph)	0	1	0	0	0	123	0	0	0	0	0	0
Lane Group Flow (vph)	0	1	0	138	0	62	0	716	0	0	621	0
Confl. Peds. (#/hr)	21		15	15		21			118	118		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	5%	2%
Turn Type	Perm	NA		Perm		Perm		NA			NA	
Protected Phases		8						2			6	
Permitted Phases	8			4		4						
Actuated Green, G (s)		27.5		27.5		27.5		72.0			72.0	
Effective Green, g (s)		29.5		29.5		29.5		74.0			74.0	
Actuated g/C Ratio		0.27		0.27		0.27		0.67			0.67	
Clearance Time (s)		5.0		5.0		5.0		5.5			5.5	
Lane Grp Cap (vph)		381		300		324		1027			1032	
v/s Ratio Prot								c0.47			0.40	
v/s Ratio Perm		0.00		c0.12		0.05						
v/c Ratio		0.00		0.46		0.19		0.70			0.60	
Uniform Delay, d1		29.5		33.6		31.1		11.1			9.9	
Progression Factor		1.00		0.84		0.54		0.61			0.10	
Incremental Delay, d2		0.0		4.9		1.3		3.3			2.3	
Delay (s)		29.5		33.1		18.2		10.1			3.3	
Level of Service		C		C		B		B			A	
Approach Delay (s)		29.5			24.6			10.1			3.3	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 20: W St NW & 6th St NW



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑			↗
Traffic Volume (veh/h)	0	0	213	23	0	88
Future Volume (Veh/h)	0	0	213	23	0	88
Sign Control		Free	Free		Stop	
Grade		0%	1%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	251	27	0	104
Pedestrians		56	74		67	
Lane Width (ft)		0.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	6		6	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		382	771			
pX, platoon unblocked						
vC, conflicting volume	345				406	388
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	345				406	388
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	83
cM capacity (veh/h)	1146				533	624
Direction, Lane #	WB 1	SB 1				
Volume Total	278	104				
Volume Left	0	0				
Volume Right	27	104				
cSH	1700	624				
Volume to Capacity	0.16	0.17				
Queue Length 95th (ft)	0	15				
Control Delay (s)	0.0	11.9				
Lane LOS		B				
Approach Delay (s)	0.0	11.9				
Approach LOS		B				
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			34.0%		ICU Level of Service	A
Analysis Period (min)			15			



Lane Group	NBT	SBT	SBR
Lane Group Flow (vph)	513	293	151
v/c Ratio	0.82	0.67	0.37
Control Delay	38.8	38.1	10.4
Queue Delay	0.0	2.9	0.0
Total Delay	38.8	41.0	10.4
Queue Length 50th (ft)	306	182	28
Queue Length 95th (ft)	#480	m285	m59
Internal Link Dist (ft)	301	289	
Turn Bay Length (ft)			110
Base Capacity (vph)	624	437	404
Starvation Cap Reductn	0	69	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.82	0.80	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
21: 4th St NW & W St NW

Howard University CMP
11/24/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								↕			↕	↕
Traffic Volume (vph)	0	0	0	0	0	0	28	403	20	9	249	133
Future Volume (vph)	0	0	0	0	0	0	28	403	20	9	249	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	14	14	14	10	10	8	10	10	10
Grade (%)		0%			0%			2%			-4%	
Total Lost time (s)								3.0			3.0	3.0
Lane Util. Factor								1.00			1.00	1.00
Frbp, ped/bikes								1.00			1.00	0.82
Flpb, ped/bikes								1.00			1.00	1.00
Frt								0.99			1.00	0.85
Flt Protected								1.00			1.00	1.00
Satd. Flow (prot)								1370			1533	1078
Flt Permitted								1.00			0.98	1.00
Satd. Flow (perm)								1370			1504	1078
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	0	0	0	0	0	32	458	23	10	283	151
RTOR Reduction (vph)	0	0	0	0	0	0	0	2	0	0	0	91
Lane Group Flow (vph)	0	0	0	0	0	0	0	511	0	0	293	60
Confl. Peds. (#/hr)	31		24	24			31	27		18	18	27
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	10%	2%	6%	5%
Parking (#/hr)		0			0			0				
Turn Type							Split	NA		Perm	NA	Perm
Protected Phases							2	2			4	
Permitted Phases									4			4
Actuated Green, G (s)								48.0			30.0	30.0
Effective Green, g (s)								50.0			32.0	32.0
Actuated g/C Ratio								0.45			0.29	0.29
Clearance Time (s)								5.0			5.0	5.0
Lane Grp Cap (vph)								622			437	313
v/s Ratio Prot								c0.37				
v/s Ratio Perm											c0.19	0.06
v/c Ratio								0.82			0.67	0.19
Uniform Delay, d1								26.1			34.4	29.3
Progression Factor								1.00			0.89	1.03
Incremental Delay, d2								11.7			6.7	1.1
Delay (s)								37.8			37.3	31.4
Level of Service								D			D	C
Approach Delay (s)		0.0			0.0			37.8			35.3	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			36.6								HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			110.0								Sum of lost time (s)	12.0
Intersection Capacity Utilization			48.5%								ICU Level of Service	A
Analysis Period (min)			15									

c Critical Lane Group



Lane Group	EBT	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	179	91	51	569	10	610	175
v/c Ratio	0.67	0.26	0.14	0.58	0.02	0.60	0.22
Control Delay	46.8	34.5	9.7	9.4	0.7	10.5	2.0
Queue Delay	0.0	0.0	0.0	0.8	0.0	0.4	0.0
Total Delay	46.8	34.5	9.7	10.2	0.7	10.9	2.0
Queue Length 50th (ft)	104	51	0	135	0	142	2
Queue Length 95th (ft)	#199	97	30	m153	m0	223	16
Internal Link Dist (ft)	191	145		200		370	
Turn Bay Length (ft)					115		150
Base Capacity (vph)	269	349	355	983	428	1024	795
Starvation Cap Reductn	0	0	0	167	0	117	0
Spillback Cap Reductn	0	0	0	6	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.26	0.14	0.70	0.02	0.67	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 22: Georgia Ave NW & V ST NW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↕	↗		↕	↗		↕	↗	
Traffic Volume (vph)	102	30	40	39	48	49	17	529	10	9	577	168	
Future Volume (vph)	102	30	40	39	48	49	17	529	10	9	577	168	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	10	10	10	12	12	12	10	10	10	10	10	10	
Grade (%)		3%			-1%			1%			-2%		
Total Lost time (s)		3.5			3.5	3.5		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes		0.98			1.00	0.91		1.00	0.48		1.00	0.84	
Flpb, ped/bikes		0.96			0.99	1.00		1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85		1.00	0.85		1.00	0.85	
Flt Protected		0.97			0.98	1.00		1.00	1.00		1.00	1.00	
Satd. Flow (prot)		1234			1552	1205		1506	629		1544	1104	
Flt Permitted		0.77			0.84	1.00		0.98	1.00		0.99	1.00	
Satd. Flow (perm)		983			1325	1205		1472	629		1533	1104	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	106	31	42	41	50	51	18	551	10	9	601	175	
RTOR Reduction (vph)	0	10	0	0	0	38	0	0	3	0	0	58	
Lane Group Flow (vph)	0	169	0	0	91	13	0	569	7	0	610	117	
Confl. Peds. (#/hr)	23		16	16		23	50		157	157		50	
Heavy Vehicles (%)	2%	2%	2%	8%	6%	10%	10%	5%	2%	10%	4%	4%	
Parking (#/hr)	0	0	0										
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	
Protected Phases		8			4			2			6		
Permitted Phases	8			4		4	2		2	6		6	
Actuated Green, G (s)		27.0			27.0	27.0		71.5	71.5		71.5	71.5	
Effective Green, g (s)		29.0			29.0	29.0		73.5	73.5		73.5	73.5	
Actuated g/C Ratio		0.26			0.26	0.26		0.67	0.67		0.67	0.67	
Clearance Time (s)		5.5			5.5	5.5		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)		259			349	317		983	420		1024	737	
v/s Ratio Prot													
v/s Ratio Perm		c0.17			0.07	0.01		0.39	0.01		c0.40	0.11	
v/c Ratio		0.65			0.26	0.04		0.58	0.02		0.60	0.16	
Uniform Delay, d1		36.0			32.0	30.2		9.9	6.1		10.1	6.8	
Progression Factor		1.00			1.00	1.00		0.81	0.91		0.79	1.38	
Incremental Delay, d2		12.1			1.8	0.3		1.1	0.0		2.1	0.4	
Delay (s)		48.1			33.8	30.4		9.1	5.6		10.1	9.7	
Level of Service		D			C	C		A	A		B	A	
Approach Delay (s)		48.1			32.6			9.0			10.0		
Approach LOS		D			C			A			B		
Intersection Summary													
HCM 2000 Control Delay			15.6									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.61										
Actuated Cycle Length (s)			110.0									Sum of lost time (s)	7.5
Intersection Capacity Utilization			72.0%									ICU Level of Service	C
Analysis Period (min)			15										

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 23: Georgia Ave NW & HU Hospital



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↩			↩
Traffic Volume (veh/h)	0	0	577	32	31	607
Future Volume (Veh/h)	0	0	577	32	31	607
Sign Control	Stop		Free		Free	
Grade	0%		1%		-2%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	0	601	33	32	632
Pedestrians	296		19			
Lane Width (ft)	0.0		12.0			
Walking Speed (ft/s)	4.0		4.0			
Percent Blockage	0		2			
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	259			280		
pX, platoon unblocked	0.84	0.73			0.73	
vC, conflicting volume	1628	914			930	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1096	700			722	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			95	
cM capacity (veh/h)	185	322			645	
Direction, Lane #	NB 1	SB 1				
Volume Total	634	664				
Volume Left	0	32				
Volume Right	33	0				
cSH	1700	645				
Volume to Capacity	0.37	0.05				
Queue Length 95th (ft)	0	4				
Control Delay (s)	0.0	1.3				
Lane LOS	A					
Approach Delay (s)	0.0	1.3				
Approach LOS						
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			66.9%	ICU Level of Service	C	
Analysis Period (min)			15			



Lane Group	EBT	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	534	940	409	201	436	63
v/c Ratio	0.52	0.90	0.90	0.51	0.52	0.11
Control Delay	27.9	44.8	58.6	21.8	22.2	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.4	0.0
Total Delay	27.9	44.8	58.6	21.8	22.5	5.5
Queue Length 50th (ft)	149	324	271	86	202	5
Queue Length 95th (ft)	200	#444	#451	119	236	m16
Internal Link Dist (ft)	189	477	172		179	
Turn Bay Length (ft)				100		160
Base Capacity (vph)	1023	1041	455	393	839	548
Starvation Cap Reductn	0	0	0	0	101	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.90	0.90	0.51	0.59	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 24: 7th St NW/Georgia Ave NW & Florida Ave NW

Howard University CMP
 11/24/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑		↑	↑	↑
Traffic Volume (vph)	2	410	63	3	615	219	0	358	6	179	388	56
Future Volume (vph)	2	410	63	3	615	219	0	358	6	179	388	56
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
Grade (%)		1%			1%			2%			-2%	
Total Lost time (s)		4.0			4.0			4.0		3.0	4.0	4.0
Lane Util. Factor		0.95			0.95			1.00		1.00	1.00	1.00
Frbp, ped/bikes		0.96			0.96			0.99		1.00	1.00	0.72
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	1.00
Frt		0.98			0.96			1.00		1.00	1.00	0.85
Flt Protected		1.00			1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)		2751			2792			1318		1458	1565	969
Flt Permitted		0.95			0.95			1.00		0.27	1.00	1.00
Satd. Flow (perm)		2621			2663			1318		407	1565	969
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	2	461	71	3	691	246	0	402	7	201	436	63
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	0	0	0	29
Lane Group Flow (vph)	0	534	0	0	940	0	0	408	0	201	436	34
Confl. Peds. (#/hr)	43		97	97		43	165		447	447		165
Heavy Vehicles (%)	2%	7%	5%	2%	4%	2%	2%	7%	2%	5%	3%	2%
Parking (#/hr)								0	0			
Turn Type	Perm	NA		Perm	NA			NA		pm+pt	NA	Perm
Protected Phases		6			2			8		7	4	
Permitted Phases	6			2						4		4
Actuated Green, G (s)		41.0			41.0			36.0		57.0	57.0	57.0
Effective Green, g (s)		43.0			43.0			38.0		59.0	59.0	59.0
Actuated g/C Ratio		0.39			0.39			0.35		0.54	0.54	0.54
Clearance Time (s)		6.0			6.0			6.0		5.0	6.0	6.0
Lane Grp Cap (vph)		1024			1040			455		390	839	519
v/s Ratio Prot								c0.31		0.08	c0.28	
v/s Ratio Perm		0.20			c0.35					0.19		0.03
v/c Ratio		0.52			0.90			0.90		0.52	0.52	0.07
Uniform Delay, d1		25.6			31.6			34.2		16.2	16.4	12.3
Progression Factor		1.00			1.00			1.00		1.32	1.20	1.59
Incremental Delay, d2		1.9			12.6			23.1		4.2	2.0	0.2
Delay (s)		27.5			44.2			57.2		25.5	21.6	19.6
Level of Service		C			D			E		C	C	B
Approach Delay (s)		27.5			44.2			57.2			22.5	
Approach LOS		C			D			E			C	

Intersection Summary

HCM 2000 Control Delay	36.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 25: Georgia Ave NW & Gresham PI NW

Howard University CMP
 11/24/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↕			↕	
Traffic Volume (veh/h)	0	0	0	54	10	85	10	1034	0	0	607	23
Future Volume (Veh/h)	0	0	0	54	10	85	10	1034	0	0	607	23
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	0	0	55	10	87	10	1055	0	0	619	23
Pedestrians	109			89			25			37		
Lane Width (ft)	0.0			12.0			12.0			12.0		
Walking Speed (ft/s)	4.0			4.0			4.0			4.0		
Percent Blockage	0			7			2			3		
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							557			210		
pX, platoon unblocked	0.91	0.91	0.89	0.91	0.91	0.85	0.89				0.85	
vC, conflicting volume	1416	1904	455	1498	1915	654	751				1144	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	721	1259	150	812	1271	249	481				824	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	100	74	93	85	99				100	
cM capacity (veh/h)	208	141	760	208	138	575	962				633	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2							
Volume Total	152	362	703	413	229							
Volume Left	55	10	0	0	0							
Volume Right	87	0	0	0	23							
cSH	311	962	1700	1700	1700							
Volume to Capacity	0.49	0.01	0.41	0.24	0.13							
Queue Length 95th (ft)	63	1	0	0	0							
Control Delay (s)	27.1	0.4	0.0	0.0	0.0							
Lane LOS	D	A										
Approach Delay (s)	27.1	0.1										
Approach LOS	D											
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			64.4%		ICU Level of Service				C			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 26: Florida Ave NW & 10th St NW/Barry PI NW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔		↔	↔	↔
Sign Control		Stop			Stop			Stop			Stop	Stop
Traffic Volume (vph)	25	33	4	4	22	117	6	156	12	249	181	14
Future Volume (vph)	25	33	4	4	22	117	6	156	12	249	181	14
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	27	35	4	4	24	126	6	168	13	268	195	15
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total (vph)	66	154	187	268	210							
Volume Left (vph)	27	4	6	268	0							
Volume Right (vph)	4	126	13	0	15							
Hadj (s)	0.08	-0.43	0.04	0.53	0.02							
Departure Headway (s)	5.9	5.2	5.3	5.9	5.3							
Degree Utilization, x	0.11	0.22	0.27	0.44	0.31							
Capacity (veh/h)	552	634	650	595	653							
Control Delay (s)	9.6	9.6	10.2	12.2	9.6							
Approach Delay (s)	9.6	9.6	10.2	11.0								
Approach LOS	A	A	B	B								

Intersection Summary				
Delay			10.5	
Level of Service			B	
Intersection Capacity Utilization		56.1%	ICU Level of Service	B
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
 27: 9th St NW & Barry PI NW

Howard University CMP
 11/24/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	4	13	23	3	23	13	112	43	29	195	1
Future Volume (vph)	5	4	13	23	3	23	13	112	43	29	195	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	5	4	14	25	3	25	14	123	47	32	214	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	23	53	184	247								
Volume Left (vph)	5	25	14	32								
Volume Right (vph)	14	25	47	1								
Hadj (s)	-0.23	-0.15	-0.08	0.12								
Departure Headway (s)	4.7	4.7	4.3	4.4								
Degree Utilization, x	0.03	0.07	0.22	0.30								
Capacity (veh/h)	685	688	815	792								
Control Delay (s)	7.9	8.1	8.5	9.3								
Approach Delay (s)	7.9	8.1	8.5	9.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.8									
Level of Service			A									
Intersection Capacity Utilization			38.7%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 28: 4th St NW & V St NW/V St NW

Howard University CMP
 11/24/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	89	69	40	19	31	17	25	346	5	7	228	10
Future Volume (vph)	89	69	40	19	31	17	25	346	5	7	228	10
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	96	74	43	20	33	18	27	372	5	8	245	11

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	213	71	404	264
Volume Left (vph)	96	20	27	8
Volume Right (vph)	43	18	5	11
Hadj (s)	0.01	-0.04	0.06	0.08
Departure Headway (s)	5.8	6.1	5.3	5.5
Degree Utilization, x	0.35	0.12	0.59	0.40
Capacity (veh/h)	558	485	653	617
Control Delay (s)	11.9	10.0	15.5	12.1
Approach Delay (s)	11.9	10.0	15.5	12.1
Approach LOS	B	A	C	B

Intersection Summary			
Delay		13.3	
Level of Service		B	
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 29: 5th St NW & Oakdale PI NW



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↶			↷
Traffic Volume (veh/h)	0	0	88	9	6	133
Future Volume (Veh/h)	0	0	88	9	6	133
Sign Control	Free		Stop		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	104	11	7	156
Pedestrians	18		29		87	
Lane Width (ft)	0.0		12.0		12.0	
Walking Speed (ft/s)	4.0		4.0		4.0	
Percent Blockage	0		2		7	
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	29		116	47	168	116
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	29		116	47	168	116
tC, single (s)	4.1		6.5	6.2	7.1	6.5
tC, 2 stage (s)						
tF (s)	2.2		4.0	3.3	3.5	4.0
p0 queue free %	100		85	99	99	78
cM capacity (veh/h)	1546		701	997	601	701
Direction, Lane #	NB 1	SB 1				
Volume Total	115	163				
Volume Left	0	7				
Volume Right	11	0				
cSH	721	696				
Volume to Capacity	0.16	0.23				
Queue Length 95th (ft)	14	23				
Control Delay (s)	10.9	11.7				
Lane LOS	B	B				
Approach Delay (s)	10.9	11.7				
Approach LOS	B	B				
Intersection Summary						
Average Delay			11.4			
Intersection Capacity Utilization			32.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 30: 5th St NW & Parking/V St NW

Howard University CMP
 11/24/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	6	49	30	88	50	44	10	51	17	6	23	7
Future Volume (vph)	6	49	30	88	50	44	10	51	17	6	23	7
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	7	58	35	104	59	52	12	60	20	7	27	8

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	100	215	92	42
Volume Left (vph)	7	104	12	7
Volume Right (vph)	35	52	20	8
Hadj (s)	-0.16	-0.01	-0.07	-0.02
Departure Headway (s)	4.3	4.3	4.6	4.7
Degree Utilization, x	0.12	0.26	0.12	0.05
Capacity (veh/h)	800	798	730	702
Control Delay (s)	7.9	8.8	8.2	8.0
Approach Delay (s)	7.9	8.8	8.2	8.0
Approach LOS	A	A	A	A

Intersection Summary			
Delay		8.4	
Level of Service		A	
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)		15	

I. Intersection Capacity Analysis – Future conditions without the development (2030 Background)

Queues

1: Georgia Ave NW & Harvard St NW



Lane Group	EBL	EBT	NBT	SBT
Lane Group Flow (vph)	35	446	812	1414
v/c Ratio	0.09	0.53	0.45	0.85
Control Delay	27.2	32.7	9.0	20.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	27.2	32.7	9.0	20.9
Queue Length 50th (ft)	16	124	111	342
Queue Length 95th (ft)	41	175	151	465
Internal Link Dist (ft)		782	130	228
Turn Bay Length (ft)	60			
Base Capacity (vph)	389	834	1790	1656
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.09	0.53	0.45	0.85

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 1: Georgia Ave NW & Harvard St NW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	391	15	0	0	0	0	564	175	62	1225	0
Future Volume (vph)	32	391	15	0	0	0	0	564	175	62	1225	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						3.5			3.5	
Lane Util. Factor	1.00	0.95						0.95			0.95	
Frbp, ped/bikes	1.00	1.00						0.98			1.00	
Flpb, ped/bikes	0.99	1.00						1.00			1.00	
Frt	1.00	0.99						0.96			1.00	
Flt Protected	0.95	1.00						1.00			1.00	
Satd. Flow (prot)	1366	2918						2751			3016	
Flt Permitted	0.95	1.00						1.00			0.86	
Satd. Flow (perm)	1366	2918						2751			2587	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	35	430	16	0	0	0	0	620	192	68	1346	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	30	0	0	0	0
Lane Group Flow (vph)	35	443	0	0	0	0	0	782	0	0	1414	0
Confl. Peds. (#/hr)	8		22	22			8	51		37	37	51
Heavy Vehicles (%)	6%	5%	7%	2%	2%	2%	2%	7%	3%	2%	2%	2%
Parking (#/hr)	0	0	0	0	0	0	0	0	0		0	
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		8						2			6	
Permitted Phases	8									6		
Actuated Green, G (s)	26.5	26.5						62.0			62.0	
Effective Green, g (s)	28.5	28.5						64.0			64.0	
Actuated g/C Ratio	0.28	0.28						0.64			0.64	
Clearance Time (s)	6.0	6.0						5.5			5.5	
Lane Grp Cap (vph)	389	831						1760			1655	
v/s Ratio Prot		c0.15						0.28				
v/s Ratio Perm	0.03										c0.55	
v/c Ratio	0.09	0.53						0.44			0.85	
Uniform Delay, d1	26.2	30.1						9.1			14.3	
Progression Factor	1.00	1.00						1.00			1.00	
Incremental Delay, d2	0.5	2.4						0.8			5.9	
Delay (s)	26.7	32.6						9.9			20.2	
Level of Service	C	C						A			C	
Approach Delay (s)		32.2			0.0			9.9			20.2	
Approach LOS		C			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	94.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Queues
2: 5th St NW & Harvard St NW/Hobart Pl NW



Lane Group	EBT	WBL	NBR	SBT
Lane Group Flow (vph)	692	902	233	2
v/c Ratio	0.71	1.05	0.25	0.02
Control Delay	38.8	74.1	4.6	54.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	38.8	74.1	4.6	54.0
Queue Length 50th (ft)	241	651	15	2
Queue Length 95th (ft)	313	#1082	62	11
Internal Link Dist (ft)	649			121
Turn Bay Length (ft)				
Base Capacity (vph)	969	855	924	85
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.71	1.05	0.25	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

2: 5th St NW & Harvard St NW/Hobart PI NW

Howard University CMP
11/24/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑		↑					↑		↑		
Traffic Volume (vph)	0	571	59	821	0	0	0	0	212	1	1	0	
Future Volume (vph)	0	571	59	821	0	0	0	0	212	1	1	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	11	11	11	11	12	14	12	14	12	12	12	
Total Lost time (s)		4.0		4.0					4.0		4.0		
Lane Util. Factor		0.95		1.00					1.00		1.00		
Frbp, ped/bikes		0.99		1.00					1.00		1.00		
Flpb, ped/bikes		1.00		1.00					1.00		1.00		
Frt		0.99		1.00					0.86		1.00		
Flt Protected		1.00		0.95					1.00		0.98		
Satd. Flow (prot)		2817		1540					1517		1472		
Flt Permitted		1.00		0.95					1.00		0.98		
Satd. Flow (perm)		2817		1540					1517		1472		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	0	627	65	902	0	0	0	0	233	1	1	0	
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	88	0	0	0	
Lane Group Flow (vph)	0	685	0	902	0	0	0	0	145	0	2	0	
Confl. Peds. (#/hr)	3		32	32		3	10					10	
Heavy Vehicles (%)	2%	3%	5%	2%	2%	2%	2%	2%	4%	2%	2%	2%	
Parking (#/hr)	0	0									0	0	
Turn Type		NA		Prot					Prot	Perm	NA		
Protected Phases		4		6					2		3		
Permitted Phases										3			
Actuated Green, G (s)		39.0		61.0					61.0		2.0		
Effective Green, g (s)		41.0		63.0					63.0		4.0		
Actuated g/C Ratio		0.34		0.52					0.52		0.03		
Clearance Time (s)		6.0		6.0					6.0		6.0		
Vehicle Extension (s)		1.0		1.0					1.0		1.0		
Lane Grp Cap (vph)		962		808					796		49		
v/s Ratio Prot		c0.24		c0.59					0.10				
v/s Ratio Perm											0.00		
v/c Ratio		0.71		1.12					0.18		0.04		
Uniform Delay, d1		34.4		28.5					15.0		56.1		
Progression Factor		1.00		1.00					1.00		1.00		
Incremental Delay, d2		4.5		68.7					0.5		0.1		
Delay (s)		38.9		97.2					15.5		56.3		
Level of Service		D		F					B		E		
Approach Delay (s)		38.9			97.2			15.5			56.3		
Approach LOS		D			F			B			E		
Intersection Summary													
HCM 2000 Control Delay			64.6		HCM 2000 Level of Service				E				
HCM 2000 Volume to Capacity ratio			0.92										
Actuated Cycle Length (s)			120.0		Sum of lost time (s)				12.0				
Intersection Capacity Utilization			84.6%		ICU Level of Service				E				
Analysis Period (min)			15										

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

3: Georgia Ave NW & Girard St NW

Howard University CMP
11/24/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	7	17	726	1374	76
Future Volume (Veh/h)	5	7	17	726	1374	76
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	7	18	764	1446	80
Pedestrians	48			10		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	4			1		
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				336	431	
pX, platoon unblocked	0.74	0.70	0.70			
vC, conflicting volume	1962	811	1574			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1059	0	960			
tC, single (s)	7.0	7.1	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	96	99	96			
cM capacity (veh/h)	141	711	478			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	12	273	509	964	562	
Volume Left	5	18	0	0	0	
Volume Right	7	0	0	0	80	
cSH	265	478	1700	1700	1700	
Volume to Capacity	0.05	0.04	0.30	0.57	0.33	
Queue Length 95th (ft)	4	3	0	0	0	
Control Delay (s)	19.2	1.4	0.0	0.0	0.0	
Lane LOS	C	A				
Approach Delay (s)	19.2	0.5		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			54.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: Georgia Ave NW & Girard St NW

Howard University CMP
11/24/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Volume (veh/h)	2	1	1	0	0	0	1	734	7	8	1336	5
Future Volume (Veh/h)	2	1	1	0	0	0	1	734	7	8	1336	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	1	1	0	0	0	1	773	7	8	1406	5
Pedestrians		38			16			1				
Lane Width (ft)		12.0			0.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		3			0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								205			562	
pX, platoon unblocked	0.77	0.77	0.72	0.77	0.77	0.90	0.72			0.90		
vC, conflicting volume	1851	2260	744	1516	2260	406	1449			796		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	941	1474	0	505	1473	130	846			562		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	100	100	100	100	100			99		
cM capacity (veh/h)	157	92	755	331	92	809	549			909		
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2							
Volume Total	4	388	394	711	708							
Volume Left	2	1	0	8	0							
Volume Right	1	0	7	0	5							
cSH	161	549	1700	909	1700							
Volume to Capacity	0.02	0.00	0.23	0.01	0.42							
Queue Length 95th (ft)	2	0	0	1	0							
Control Delay (s)	28.0	0.1	0.0	0.2	0.0							
Lane LOS	D	A		A								
Approach Delay (s)	28.0	0.0		0.1								
Approach LOS	D											
Intersection Summary												
Average Delay			0.1									
Intersection Capacity Utilization			57.8%		ICU Level of Service				B			
Analysis Period (min)			15									



Lane Group	NBT	SBT
Lane Group Flow (vph)	798	1475
v/c Ratio	0.43	0.83
Control Delay	3.1	23.7
Queue Delay	0.2	0.5
Total Delay	3.3	24.2
Queue Length 50th (ft)	28	443
Queue Length 95th (ft)	31	558
Internal Link Dist (ft)	68	125
Turn Bay Length (ft)		
Base Capacity (vph)	1859	1775
Starvation Cap Reductn	330	69
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.52	0.86
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
5: Georgia Ave NW & Fairmont St NW



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				↑↑	↑↑	
Traffic Volume (vph)	0	0	25	733	1292	109
Future Volume (vph)	0	0	25	733	1292	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				3.5	3.5	
Lane Util. Factor				0.95	0.95	
Frbp, ped/bikes				1.00	0.98	
Flpb, ped/bikes				1.00	1.00	
Frt				1.00	0.99	
Flt Protected				1.00	1.00	
Satd. Flow (prot)				2936	2911	
Flt Permitted				0.87	1.00	
Satd. Flow (perm)				2552	2911	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	26	772	1360	115
RTOR Reduction (vph)	0	0	0	0	5	0
Lane Group Flow (vph)	0	0	0	798	1470	0
Confl. Peds. (#/hr)	4		46			46
Heavy Vehicles (%)	2%	2%	4%	5%	3%	2%
Parking (#/hr)	0	0		0	0	0
Turn Type			pm+pt	NA	NA	
Protected Phases			5	2	6	
Permitted Phases			2			
Actuated Green, G (s)				84.0	71.0	
Effective Green, g (s)				86.0	73.0	
Actuated g/C Ratio				0.72	0.61	
Clearance Time (s)				5.5	5.5	
Lane Grp Cap (vph)				1859	1770	
v/s Ratio Prot				c0.03	c0.50	
v/s Ratio Perm				0.27		
v/c Ratio				0.43	0.83	
Uniform Delay, d1				7.0	18.6	
Progression Factor				0.34	1.00	
Incremental Delay, d2				0.7	4.7	
Delay (s)				3.1	23.3	
Level of Service				A	C	
Approach Delay (s)	0.0			3.1	23.3	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay			16.2	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.61			
Actuated Cycle Length (s)			120.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization			47.2%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						



Lane Group	WBL	NBT	SBT
Lane Group Flow (vph)	82	761	1379
v/c Ratio	0.23	0.36	0.64
Control Delay	20.2	1.9	0.9
Queue Delay	0.0	0.3	0.7
Total Delay	20.2	2.2	1.7
Queue Length 50th (ft)	22	11	3
Queue Length 95th (ft)	66	28	3
Internal Link Dist (ft)	247	132	68
Turn Bay Length (ft)			
Base Capacity (vph)	360	2107	2147
Starvation Cap Reductn	0	675	409
Spillback Cap Reductn	0	11	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.23	0.53	0.79
Intersection Summary			

HCM Signalized Intersection Capacity Analysis
6: Georgia Ave NW & Fairmont St NW



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↵		↕			↕
Traffic Volume (vph)	33	44	715	0	0	1296
Future Volume (vph)	33	44	715	0	0	1296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0		3.5			3.5
Lane Util. Factor	1.00		0.95			0.95
Frbp, ped/bikes	0.99		1.00			1.00
Flpb, ped/bikes	1.00		1.00			1.00
Frt	0.92		1.00			1.00
Flt Protected	0.98		1.00			1.00
Satd. Flow (prot)	1415		2940			2997
Flt Permitted	0.98		1.00			1.00
Satd. Flow (perm)	1415		2940			2997
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	35	47	761	0	0	1379
RTOR Reduction (vph)	36	0	0	0	0	0
Lane Group Flow (vph)	46	0	761	0	0	1379
Confl. Peds. (#/hr)	17	1		9	9	
Heavy Vehicles (%)	10%	7%	5%	2%	2%	3%
Parking (#/hr)			0			0
Turn Type	Prot		NA			NA
Protected Phases	4		2			2
Permitted Phases						
Actuated Green, G (s)	25.5		84.0			84.0
Effective Green, g (s)	27.5		86.0			86.0
Actuated g/C Ratio	0.23		0.72			0.72
Clearance Time (s)	5.0		5.5			5.5
Lane Grp Cap (vph)	324		2107			2147
v/s Ratio Prot	c0.03		0.26			c0.46
v/s Ratio Perm						
v/c Ratio	0.14		0.36			0.64
Uniform Delay, d1	36.8		6.5			8.9
Progression Factor	1.00		0.22			0.01
Incremental Delay, d2	0.9		0.5			0.8
Delay (s)	37.8		1.9			0.9
Level of Service	D		A			A
Approach Delay (s)	37.8		1.9			0.9
Approach LOS	D		A			A

Intersection Summary

HCM 2000 Control Delay	2.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	64.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
7: 6th St NW & Fairmont St NW



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑	↘	
Traffic Volume (veh/h)	0	0	0	23	70	0
Future Volume (Veh/h)	0	0	0	23	70	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	27	82	0
Pedestrians	37			122	16	
Lane Width (ft)	0.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			10	1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	327					
pX, platoon unblocked						
vC, conflicting volume			16		80	138
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			16		80	138
tC, single (s)			4.1		6.5	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			100		91	100
cM capacity (veh/h)			1580		891	807
Direction, Lane #	WB 1	NB 1				
Volume Total	27	82				
Volume Left	0	82				
Volume Right	0	0				
cSH	1700	891				
Volume to Capacity	0.02	0.09				
Queue Length 95th (ft)	0	8				
Control Delay (s)	0.0	9.4				
Lane LOS		A				
Approach Delay (s)	0.0	9.4				
Approach LOS		A				
Intersection Summary						
Average Delay			7.1			
Intersection Capacity Utilization			23.2%	ICU Level of Service	A	
Analysis Period (min)	15					

Queues
8: Georgia Ave NW & Euclid St NW



Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	107	60	689	1465
v/c Ratio	0.21	0.16	0.40	0.82
Control Delay	32.2	17.6	11.2	7.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.2	17.6	11.3	7.8
Queue Length 50th (ft)	61	15	125	65
Queue Length 95th (ft)	108	49	164	100
Internal Link Dist (ft)	705		607	132
Turn Bay Length (ft)		25		
Base Capacity (vph)	501	386	1711	1777
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	10	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.21	0.16	0.41	0.82

Intersection Summary

HCM Signalized Intersection Capacity Analysis

8: Georgia Ave NW & Euclid St NW

Howard University CMP
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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	97	55	0	627	1333	0
Future Volume (vph)	97	55	0	627	1333	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	16	10	10	10	10
Total Lost time (s)	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	
Frbp, ped/bikes	1.00	0.81		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1625	1182		2667	2770	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	1625	1182		2667	2770	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	107	60	0	689	1465	0
RTOR Reduction (vph)	0	22	0	0	0	0
Lane Group Flow (vph)	107	38	0	689	1465	0
Confl. Peds. (#/hr)	3	109	102			102
Heavy Vehicles (%)	2%	2%	2%	8%	4%	2%
Parking (#/hr)	0	0	0	0	0	0
Turn Type	Prot	Perm		NA	NA	
Protected Phases	8			2	6	
Permitted Phases		8				
Actuated Green, G (s)	35.0	35.0		75.0	75.0	
Effective Green, g (s)	37.0	37.0		77.0	77.0	
Actuated g/C Ratio	0.31	0.31		0.64	0.64	
Clearance Time (s)	5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	501	364		1711	1777	
v/s Ratio Prot	c0.07			0.26	c0.53	
v/s Ratio Perm		0.03				
v/c Ratio	0.21	0.10		0.40	0.82	
Uniform Delay, d1	30.7	29.7		10.4	16.4	
Progression Factor	1.00	1.00		1.00	0.25	
Incremental Delay, d2	1.0	0.6		0.7	3.6	
Delay (s)	31.7	30.2		11.1	7.6	
Level of Service	C	C		B	A	
Approach Delay (s)	31.2			11.1	7.6	
Approach LOS	C			B	A	

Intersection Summary

HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	NBT	SBT
Lane Group Flow (vph)	744	1402
v/c Ratio	0.37	0.80
Control Delay	3.9	13.1
Queue Delay	0.0	1.2
Total Delay	3.9	14.3
Queue Length 50th (ft)	54	273
Queue Length 95th (ft)	66	383
Internal Link Dist (ft)	410	607
Turn Bay Length (ft)		
Base Capacity (vph)	2012	1744
Starvation Cap Reductn	0	62
Spillback Cap Reductn	0	157
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.37	0.88
Intersection Summary		

HCM Signalized Intersection Capacity Analysis















9: Georgia Ave NW & Howard PI NW

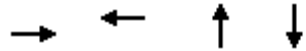
Howard University CMP
11/24/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑↑			↑↑
Traffic Volume (vph)	0	0	625	89	94	1252
Future Volume (vph)	0	0	625	89	94	1252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10
Grade (%)	-10%		5%			-5%
Total Lost time (s)			3.0			3.0
Lane Util. Factor			0.95			0.95
Frbp, ped/bikes			0.98			1.00
Flpb, ped/bikes			1.00			1.00
Frt			0.98			1.00
Flt Protected			1.00			1.00
Satd. Flow (prot)			2655			2827
Flt Permitted			1.00			0.81
Satd. Flow (perm)			2655			2311
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	651	93	98	1304
RTOR Reduction (vph)	0	0	10	0	0	0
Lane Group Flow (vph)	0	0	734	0	0	1402
Confl. Peds. (#/hr)	30	51		22	22	
Heavy Vehicles (%)	2%	2%	7%	10%	2%	4%
Parking (#/hr)						0
Turn Type			NA		Perm	NA
Protected Phases			2			6
Permitted Phases					6	
Actuated Green, G (s)			81.0			81.0
Effective Green, g (s)			83.0			83.0
Actuated g/C Ratio			0.75			0.75
Clearance Time (s)			5.0			5.0
Vehicle Extension (s)			1.0			1.0
Lane Grp Cap (vph)			2003			1743
v/s Ratio Prot			0.28			
v/s Ratio Perm						c0.61
v/c Ratio			0.37			0.80
Uniform Delay, d1			4.6			8.4
Progression Factor			0.81			1.00
Incremental Delay, d2			0.4			4.1
Delay (s)			4.1			12.5
Level of Service			A			B
Approach Delay (s)	0.0		4.1			12.5
Approach LOS	A		A			B
Intersection Summary						
HCM 2000 Control Delay			9.6		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.65			
Actuated Cycle Length (s)			110.0		Sum of lost time (s)	7.0
Intersection Capacity Utilization			85.6%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis
 10: 6th St NW & Howard PI NW

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	42	52	56	0	36	0	0	0	0	0	0
Future Volume (Veh/h)	80	42	52	56	0	36	0	0	0	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		-13%			-10%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	90	47	58	63	0	40	0	0	0	0	0	0
Pedestrians		48			39			133			57	
Lane Width (ft)		12.0			12.0			0.0			0.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		4			3			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	145	87	181	254	87	96	48			39		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	145	87	181	254	87	96	48			39		
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	87	94	93	89	100	96	100			100		
cM capacity (veh/h)	701	745	823	567	746	929	1497			1520		
Direction, Lane #	EB 1	WB 1										
Volume Total	195	103										
Volume Left	90	63										
Volume Right	58	40										
cSH	744	669										
Volume to Capacity	0.26	0.15										
Queue Length 95th (ft)	26	14										
Control Delay (s)	11.5	11.4										
Lane LOS	B	B										
Approach Delay (s)	11.5	11.4										
Approach LOS	B	B										
Intersection Summary												
Average Delay			11.5									
Intersection Capacity Utilization			17.4%		ICU Level of Service				A			
Analysis Period (min)			15									



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	26	27	322	683
v/c Ratio	0.17	0.21	0.35	0.53
Control Delay	37.3	42.4	4.5	8.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	37.3	42.4	4.5	8.7
Queue Length 50th (ft)	12	15	20	188
Queue Length 95th (ft)	40	43	78	268
Internal Link Dist (ft)	690	766	403	656
Turn Bay Length (ft)				
Base Capacity (vph)	150	131	913	1288
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.21	0.35	0.53

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 11: 4th St NW/5th St NW & Howard PI NW/McMillan Dr NW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	18	1	6	22	1	3	33	226	44	17	569	56
Future Volume (vph)	18	1	6	22	1	3	33	226	44	17	569	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	8	8	8	12	12	12	12	12	8	15	15	8
Grade (%)		-13%			6%			6%			0%	
Total Lost time (s)		5.0			5.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.93			1.00			0.99			1.00	
Flpb, ped/bikes		0.99			0.76			1.00			1.00	
Frt		0.97			0.98			0.98			0.99	
Flt Protected		0.96			0.96			0.99			1.00	
Satd. Flow (prot)		1200			1104			1404			1810	
Flt Permitted		0.80			0.77			0.90			0.99	
Satd. Flow (perm)		1001			889			1264			1790	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	19	1	6	23	1	3	35	240	47	18	605	60
RTOR Reduction (vph)	0	5	0	0	3	0	0	6	0	0	3	0
Lane Group Flow (vph)	0	21	0	0	24	0	0	316	0	0	680	0
Confl. Peds. (#/hr)	3		68	68		3	8		10	10		8
Heavy Vehicles (%)	2%	2%	2%	9%	2%	2%	2%	3%	2%	2%	2%	2%
Parking (#/hr)		0						0				
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			6			2	
Permitted Phases	4			4			6			2		
Actuated Green, G (s)		14.0			14.0			77.0			77.0	
Effective Green, g (s)		16.0			16.0			79.0			79.0	
Actuated g/C Ratio		0.15			0.15			0.72			0.72	
Clearance Time (s)		7.0			7.0			6.0			6.0	
Lane Grp Cap (vph)		145			129			907			1285	
v/s Ratio Prot												
v/s Ratio Perm		0.02			0.03			0.25			0.38	
v/c Ratio		0.14			0.19			0.35			0.53	
Uniform Delay, d1		41.0			41.3			5.8			7.0	
Progression Factor		1.00			1.00			0.62			1.00	
Incremental Delay, d2		2.1			3.2			1.0			1.6	
Delay (s)		43.1			44.5			4.7			8.6	
Level of Service		D			D			A			A	
Approach Delay (s)		43.1			44.5			4.7			8.6	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group





















Queues
12: Sherman Ave NW & Barry PI NW



Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	155	194	39	15	252	75	34	814
v/c Ratio	0.35	0.54	0.11	0.05	0.26	0.11	0.07	0.42
Control Delay	32.0	38.0	9.3	9.0	10.3	2.3	8.9	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	38.0	9.3	9.0	10.3	2.3	8.9	11.3
Queue Length 50th (ft)	84	113	0	4	75	0	9	140
Queue Length 95th (ft)	143	190	25	13	117	17	22	181
Internal Link Dist (ft)	139	246			167			404
Turn Bay Length (ft)			100	110		100	95	
Base Capacity (vph)	440	357	346	276	987	700	498	1950
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.54	0.11	0.05	0.26	0.11	0.07	0.42

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 12: Sherman Ave NW & Barry PI NW

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	102	1	70	114	37	14	239	71	32	698	75
Future Volume (vph)	45	102	1	70	114	37	14	239	71	32	698	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	9	9	12	12	12	10	12	10
Grade (%)		-1%			3%			0%			-3%	
Total Lost time (s)		4.0			4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	0.95	
Frbp, ped/bikes		1.00			1.00	0.85	1.00	1.00	0.82	1.00	1.00	
Flpb, ped/bikes		0.97			0.98	1.00	0.97	1.00	1.00	0.90	1.00	
Frt		1.00			1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.99			0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1601			1343	1021	1436	1598	1087	1336	3144	
Flt Permitted		0.86			0.83	1.00	0.30	1.00	1.00	0.57	1.00	
Satd. Flow (perm)		1402			1141	1021	447	1598	1087	806	3144	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	47	107	1	74	120	39	15	252	75	34	735	79
RTOR Reduction (vph)	0	0	0	0	0	27	0	0	29	0	7	0
Lane Group Flow (vph)	0	155	0	0	194	12	15	252	46	34	807	0
Confl. Peds. (#/hr)	49		48	48		49	31		35	35		31
Heavy Vehicles (%)	2%	3%	2%	7%	9%	7%	10%	7%	10%	4%	3%	2%
Parking (#/hr)												0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		32.5			32.5	32.5	66.0	66.0	66.0	66.0	66.0	
Effective Green, g (s)		34.5			34.5	34.5	68.0	68.0	68.0	68.0	68.0	
Actuated g/C Ratio		0.31			0.31	0.31	0.62	0.62	0.62	0.62	0.62	
Clearance Time (s)		6.0			6.0	6.0	5.5	5.5	5.5	5.5	5.5	
Lane Grp Cap (vph)		439			357	320	276	987	671	498	1943	
v/s Ratio Prot								0.16			c0.26	
v/s Ratio Perm		0.11			c0.17	0.01	0.03		0.04	0.04		
v/c Ratio		0.35			0.54	0.04	0.05	0.26	0.07	0.07	0.42	
Uniform Delay, d1		29.1			31.2	26.2	8.3	9.5	8.4	8.4	10.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.2			5.8	0.2	0.4	0.6	0.2	0.3	0.7	
Delay (s)		31.4			37.1	26.4	8.7	10.1	8.6	8.6	11.4	
Level of Service		C			D	C	A	B	A	A	B	
Approach Delay (s)		31.4			35.3			9.7			11.3	
Approach LOS		C			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			16.5		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			110.0		Sum of lost time (s)					7.5		
Intersection Capacity Utilization			54.8%		ICU Level of Service					A		
Analysis Period (min)			15									

c Critical Lane Group

Queues
13: Georgia Ave NW & Barry PI NW



Lane Group	EBL	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	193	88	605	991	277
v/c Ratio	0.70	0.63	0.62	1.12	0.47
Control Delay	49.9	32.4	8.4	81.7	3.1
Queue Delay	0.0	0.0	0.9	0.0	0.0
Total Delay	49.9	32.4	9.2	81.7	3.1
Queue Length 50th (ft)	115	20	84	~810	7
Queue Length 95th (ft)	#217	m30	m126	#1049	m32
Internal Link Dist (ft)	494		293	410	
Turn Bay Length (ft)		125			
Base Capacity (vph)	276	139	970	886	586
Starvation Cap Reductn	0	0	147	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.70	0.63	0.74	1.12	0.47

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 13: Georgia Ave NW & Barry PI NW



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	136	53	86	593	971	271
Future Volume (vph)	136	53	86	593	971	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	10	10	10	10
Grade (%)	4%			3%	-5%	
Total Lost time (s)	3.0		3.0	3.0	3.0	3.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.91		1.00	1.00	1.00	0.63
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.96		1.00	1.00	1.00	0.85
Flt Protected	0.97		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1116		1370	1483	1573	862
Flt Permitted	0.97		0.06	1.00	1.00	1.00
Satd. Flow (perm)	1116		89	1483	1573	862
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	139	54	88	605	991	277
RTOR Reduction (vph)	13	0	0	0	0	101
Lane Group Flow (vph)	180	0	88	605	991	176
Confl. Peds. (#/hr)	82	93	58			58
Heavy Vehicles (%)	10%	10%	9%	6%	4%	2%
Parking (#/hr)	0	0				
Turn Type	Prot		pm+pt	NA	NA	Perm
Protected Phases	8		5	2	6	
Permitted Phases			2			6
Actuated Green, G (s)	24.0		70.0	70.0	60.0	60.0
Effective Green, g (s)	26.0		72.0	72.0	62.0	62.0
Actuated g/C Ratio	0.24		0.65	0.65	0.56	0.56
Clearance Time (s)	5.0		5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	263		139	970	886	485
v/s Ratio Prot	c0.16		0.04	c0.41	c0.63	
v/s Ratio Perm			0.37			0.20
v/c Ratio	0.68		0.63	0.62	1.12	0.36
Uniform Delay, d1	38.3		44.4	11.1	24.0	13.2
Progression Factor	1.00		0.64	0.58	0.67	0.53
Incremental Delay, d2	13.6		10.8	1.6	62.6	1.2
Delay (s)	51.8		39.2	8.0	78.6	8.2
Level of Service	D		D	A	E	A
Approach Delay (s)	51.8			12.0	63.2	
Approach LOS	D			B	E	

Intersection Summary			
HCM 2000 Control Delay	45.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		

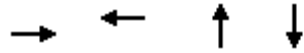
c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 14: 6th St NW & College St NW



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰					↱
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	55	0	0	0	23	63
Future Volume (vph)	55	0	0	0	23	63
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	60	0	0	0	25	69
Direction, Lane #	WB 1	SB 1				
Volume Total (vph)	60	94				
Volume Left (vph)	60	25				
Volume Right (vph)	0	0				
Hadj (s)	0.27	0.12				
Departure Headway (s)	4.4	4.2				
Degree Utilization, x	0.07	0.11				
Capacity (veh/h)	801	842				
Control Delay (s)	7.7	7.7				
Approach Delay (s)	7.7	7.7				
Approach LOS	A	A				
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			29.3%		ICU Level of Service	A
Analysis Period (min)			15			

Queues
15: 4th St NW & College St NW



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	16	3	325	610
v/c Ratio	0.09	0.01	0.34	0.54
Control Delay	28.7	31.7	1.3	6.1
Queue Delay	0.0	0.0	0.5	0.0
Total Delay	28.7	31.7	1.8	6.1
Queue Length 50th (ft)	6	1	5	104
Queue Length 95th (ft)	26	9	m5	124
Internal Link Dist (ft)	696	244	287	403
Turn Bay Length (ft)				
Base Capacity (vph)	184	226	963	1124
Starvation Cap Reductn	0	0	302	0
Spillback Cap Reductn	0	0	0	13
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.09	0.01	0.49	0.55

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
15: 4th St NW & College St NW

Howard University CMP
11/24/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕			↕			↕			↕		
Traffic Volume (vph)	8	1	6	1	1	1	32	271	3	1	537	36	
Future Volume (vph)	8	1	6	1	1	1	32	271	3	1	537	36	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		0%			0%			6%			-8%		
Total Lost time (s)		3.0			3.0			3.0			3.0		
Lane Util. Factor		1.00			1.00			1.00			1.00		
Frbp, ped/bikes		0.86			0.92			1.00			0.98		
Flpb, ped/bikes		0.80			0.88			0.99			1.00		
Frt		0.95			0.95			1.00			0.99		
Flt Protected		0.97			0.98			0.99			1.00		
Satd. Flow (prot)		964			1153			1411			1504		
Flt Permitted		0.91			0.96			0.91			1.00		
Satd. Flow (perm)		901			1130			1292			1504		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Adj. Flow (vph)	9	1	6	1	1	1	34	288	3	1	571	38	
RTOR Reduction (vph)	0	5	0	0	1	0	0	0	0	0	2	0	
Lane Group Flow (vph)	0	11	0	0	2	0	0	325	0	0	608	0	
Confl. Peds. (#/hr)	90		90	90		90	81		112	112		81	
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	10%	2%	3%	2%	
Parking (#/hr)		0			0			0			0		
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		4			8			6			2		
Permitted Phases	4			8			6			2			
Actuated Green, G (s)		20.0			20.0			80.0			80.0		
Effective Green, g (s)		22.0			22.0			82.0			82.0		
Actuated g/C Ratio		0.20			0.20			0.75			0.75		
Clearance Time (s)		5.0			5.0			5.0			5.0		
Lane Grp Cap (vph)		180			226			963			1121		
v/s Ratio Prot													
v/s Ratio Perm		c0.01			0.00			0.25			0.40		
v/c Ratio		0.06			0.01			0.34			0.54		
Uniform Delay, d1		35.6			35.3			4.8			6.0		
Progression Factor		1.00			1.00			0.08			0.72		
Incremental Delay, d2		0.7			0.1			0.9			1.6		
Delay (s)		36.3			35.3			1.2			6.0		
Level of Service		D			D			A			A		
Approach Delay (s)		36.3			35.3			1.2			6.0		
Approach LOS		D			D			A			A		
Intersection Summary													
HCM 2000 Control Delay			5.0									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.44										
Actuated Cycle Length (s)			110.0									Sum of lost time (s)	6.0
Intersection Capacity Utilization			62.9%									ICU Level of Service	B
Analysis Period (min)			15										

c Critical Lane Group

Queues
16: Georgia Ave NW & Bryant St NW



Lane Group	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	27	795	68	116	1016
v/c Ratio	0.08	0.85	0.11	0.38	0.92
Control Delay	25.5	23.3	7.5	1.2	8.1
Queue Delay	0.0	0.0	0.0	0.0	8.7
Total Delay	25.5	23.3	7.5	1.2	16.8
Queue Length 50th (ft)	10	395	12	5	52
Queue Length 95th (ft)	34	#715	m27	m4	m36
Internal Link Dist (ft)	265	279			293
Turn Bay Length (ft)			100	125	
Base Capacity (vph)	346	934	620	302	1107
Starvation Cap Reductn	0	0	0	0	82
Spillback Cap Reductn	0	0	0	0	6
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.08	0.85	0.11	0.38	0.99

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 16: Georgia Ave NW & Bryant St NW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕	↕	↕	↕	
Traffic Volume (vph)	13	3	9	0	0	0	2	722	62	106	918	6
Future Volume (vph)	13	3	9	0	0	0	2	722	62	106	918	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	10	12	10	12	10	10	10	10	12
Grade (%)		0%			0%			2%				-3%
Total Lost time (s)		3.5						3.5	3.5	3.0	3.5	
Lane Util. Factor		1.00						1.00	1.00	1.00	1.00	
Frbp, ped/bikes		1.00						1.00	0.77	1.00	1.00	
Flpb, ped/bikes		1.00						1.00	1.00	1.00	1.00	
Frt		0.95						1.00	0.85	1.00	1.00	
Flt Protected		0.97						1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1552						1491	989	1480	1542	
Flt Permitted		0.97						1.00	1.00	0.20	1.00	
Satd. Flow (perm)		1552						1489	989	316	1542	
Peak-hour factor, PHF	0.90	0.90	0.90	0.91	0.90	0.91	0.90	0.91	0.91	0.91	0.91	0.90
Adj. Flow (vph)	14	3	10	0	0	0	2	793	68	116	1009	7
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	19	0	0	0	0	0	795	68	116	1016	0
Confl. Peds. (#/hr)				39		40			46	46		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	6%	5%	4%	5%	2%
Turn Type	Perm	NA					Perm	NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4						2		2	6		
Actuated Green, G (s)		22.0						67.0	67.0	77.0	77.0	
Effective Green, g (s)		24.0						69.0	69.0	79.0	79.0	
Actuated g/C Ratio		0.22						0.63	0.63	0.72	0.72	
Clearance Time (s)		5.5						5.5	5.5	5.0	5.5	
Vehicle Extension (s)		1.0						1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)		338						934	620	301	1107	
v/s Ratio Prot										0.02	c0.66	
v/s Ratio Perm		0.01						0.53	0.07	0.25		
v/c Ratio		0.06						0.85	0.11	0.39	0.92	
Uniform Delay, d1		34.0						16.4	8.2	10.6	12.8	
Progression Factor		1.00						0.83	0.85	0.19	0.38	
Incremental Delay, d2		0.3						8.5	0.3	0.3	1.6	
Delay (s)		34.4						22.0	7.3	2.3	6.5	
Level of Service		C						C	A	A	A	
Approach Delay (s)		34.4		0.0				20.9			6.0	
Approach LOS		C		A				C			A	

Intersection Summary		
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.74	B
Actuated Cycle Length (s)	110.0	Sum of lost time (s)
Intersection Capacity Utilization	115.2%	10.0
Analysis Period (min)	15	ICU Level of Service
		H

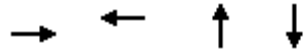
c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 17: 6th St NW & Bryant St NW

Howard University CMP
 11/24/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↻							↻		↻		
Traffic Volume (veh/h)	0	167	19	0	0	0	0	0	4	41	71	0	
Future Volume (Veh/h)	0	167	19	0	0	0	0	0	4	41	71	0	
Sign Control		Free			Free			Stop			Stop		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	
Hourly flow rate (vph)	0	196	22	0	0	0	0	0	5	48	84	0	
Pedestrians		21			32			18			47		
Lane Width (ft)		12.0			0.0			12.0			12.0		
Walking Speed (ft/s)		4.0			4.0			4.0			4.0		
Percent Blockage		2			0			1			4		
Right turn flare (veh)													
Median type		None			None								
Median storage (veh)													
Upstream signal (ft)		339			770								
pX, platoon unblocked													
vC, conflicting volume	47				236			288	272	257	291	283	68
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	47				236			288	272	257	291	283	68
tC, single (s)	4.1				4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)													
tF (s)	2.2				2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	100				100			100	100	99	92	86	100
cM capacity (veh/h)	1499				1311			550	601	770	596	591	940
Direction, Lane #	EB 1	NB 1	SB 1										
Volume Total	218	5	132										
Volume Left	0	0	48										
Volume Right	22	5	0										
cSH	1700	770	593										
Volume to Capacity	0.13	0.01	0.22										
Queue Length 95th (ft)	0	0	21										
Control Delay (s)	0.0	9.7	12.8										
Lane LOS		A	B										
Approach Delay (s)	0.0	9.7	12.8										
Approach LOS		A	B										
Intersection Summary													
Average Delay			4.9										
Intersection Capacity Utilization			42.1%	ICU Level of Service	A								
Analysis Period (min)			15										



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	224	193	261	607
v/c Ratio	0.69	0.80	0.30	0.72
Control Delay	46.5	50.3	3.4	12.0
Queue Delay	0.0	0.2	3.2	0.4
Total Delay	46.5	50.5	6.6	12.4
Queue Length 50th (ft)	107	89	0	152
Queue Length 95th (ft)	#205	#222	m0	192
Internal Link Dist (ft)	690	359	289	287
Turn Bay Length (ft)				
Base Capacity (vph)	324	240	874	841
Starvation Cap Reductn	0	0	506	0
Spillback Cap Reductn	0	1	0	34
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.69	0.81	0.71	0.75

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.