



Lane Group	EBT	WBL	NBR	SBT
Lane Group Flow (vph)	617	892	231	2
v/c Ratio	0.64	1.04	0.25	0.02
Control Delay	36.3	70.5	3.6	54.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	36.3	70.5	3.6	54.0
Queue Length 50th (ft)	206	633	7	2
Queue Length 95th (ft)	272	#1064	50	11
Internal Link Dist (ft)	649			121
Turn Bay Length (ft)				
Base Capacity (vph)	966	855	934	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	0.64	1.04	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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑		↑					↑		↑		
Traffic Volume (vph)	0	502	59	812	0	0	0	0	210	1	1	0	
Future Volume (vph)	0	502	59	812	0	0	0	0	210	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		0.98		1.00					0.86		1.00		
Flt Protected		1.00		0.95					1.00		0.98		
Satd. Flow (prot)		2808		1540					1517		1472		
Flt Permitted		1.00		0.95					1.00		0.98		
Satd. Flow (perm)		2808		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	552	65	892	0	0	0	0	231	1	1	0	
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	99	0	0	0	
Lane Group Flow (vph)	0	610	0	892	0	0	0	0	132	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)		959		808					796		49		
v/s Ratio Prot		c0.22		c0.58					0.09				
v/s Ratio Perm											0.00		
v/c Ratio		0.64		1.10					0.17		0.04		
Uniform Delay, d1		33.2		28.5					14.8		56.1		
Progression Factor		1.00		1.00					1.00		1.00		
Incremental Delay, d2		3.2		64.1					0.4		0.1		
Delay (s)		36.4		92.6					15.3		56.3		
Level of Service		D		F					B		E		
Approach Delay (s)		36.4			92.6			15.3			56.3		
Approach LOS		D			F			B			E		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			62.4		HCM 2000 Level of Service				E				
HCM 2000 Volume to Capacity ratio			0.89										
Actuated Cycle Length (s)			120.0		Sum of lost time (s)				12.0				
Intersection Capacity Utilization			82.0%		ICU Level of Service				D				
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	600	1280	76
Future Volume (Veh/h)	5	7	17	600	1280	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	632	1347	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	0.76	0.73	0.73			
vC, conflicting volume	1797	762	1475			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1040	0	916			
tC, single (s)	7.0	7.1	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	97	99	97			
cM capacity (veh/h)	150	744	520			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	12	229	421	898	529	
Volume Left	5	18	0	0	0	
Volume Right	7	0	0	0	80	
cSH	280	520	1700	1700	1700	
Volume to Capacity	0.04	0.03	0.25	0.53	0.31	
Queue Length 95th (ft)	3	3	0	0	0	
Control Delay (s)	18.4	1.4	0.0	0.0	0.0	
Lane LOS	C	A				
Approach Delay (s)	18.4	0.5		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			52.1%	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	608	7	8	1267	5
Future Volume (Veh/h)	2	1	1	0	0	0	1	608	7	8	1267	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	640	7	8	1334	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	0.79	0.79	0.75	0.79	0.79	0.93	0.75			0.93		
vC, conflicting volume	1712	2056	708	1347	2054	340	1377			663		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	948	1384	0	483	1383	132	835			481		
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)	159	107	787	352	107	828	577			1000		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>							
Volume Total	4	321	327	675	672							
Volume Left	2	1	0	8	0							
Volume Right	1	0	7	0	5							
cSH	172	577	1700	1000	1700							
Volume to Capacity	0.02	0.00	0.19	0.01	0.40							
Queue Length 95th (ft)	2	0	0	1	0							
Control Delay (s)	26.4	0.1	0.0	0.2	0.0							
Lane LOS	D	A		A								
Approach Delay (s)	26.4	0.0		0.1								
Approach LOS	D											
<b>Intersection Summary</b>												
Average Delay			0.1									
Intersection Capacity Utilization			55.6%	ICU Level of Service		B						
Analysis Period (min)			15									



Lane Group	NBT	SBT
Lane Group Flow (vph)	664	1377
v/c Ratio	0.36	0.78
Control Delay	3.2	21.2
Queue Delay	0.3	0.3
Total Delay	3.5	21.5
Queue Length 50th (ft)	27	387
Queue Length 95th (ft)	31	486
Internal Link Dist (ft)	68	125
Turn Bay Length (ft)		
Base Capacity (vph)	1861	1772
Starvation Cap Reductn	578	73
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.52	0.81
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	24	607	1199	109
Future Volume (vph)	0	0	24	607	1199	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)				2935	2905	
Flt Permitted				0.87	1.00	
Satd. Flow (perm)				2555	2905	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	25	639	1262	115
RTOR Reduction (vph)	0	0	0	0	5	0
Lane Group Flow (vph)	0	0	0	664	1372	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)				1861	1767	
v/s Ratio Prot				c0.03	c0.47	
v/s Ratio Perm				0.23		
v/c Ratio				0.36	0.78	
Uniform Delay, d1				6.5	17.4	
Progression Factor				0.40	1.00	
Incremental Delay, d2				0.5	3.4	
Delay (s)				3.1	20.9	
Level of Service				A	C	
Approach Delay (s)	0.0			3.1	20.9	
Approach LOS	A			A	C	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			15.1	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.56			
Actuated Cycle Length (s)			120.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization			44.3%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						

Queues  
6: Georgia Ave NW & Fairmont St NW



Lane Group	WBL	NBT	SBT
Lane Group Flow (vph)	78	630	1276
v/c Ratio	0.22	0.30	0.59
Control Delay	20.1	2.2	0.9
Queue Delay	0.0	0.4	0.5
Total Delay	20.1	2.5	1.4
Queue Length 50th (ft)	20	11	2
Queue Length 95th (ft)	63	28	3
Internal Link Dist (ft)	247	132	68
Turn Bay Length (ft)			
Base Capacity (vph)	358	2107	2147
Starvation Cap Reductn	0	898	425
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.22	0.52	0.74
<b>Intersection Summary</b>			

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



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑↑			↑↑
Traffic Volume (vph)	31	42	592	0	0	1199
Future Volume (vph)	31	42	592	0	0	1199
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)	33	45	630	0	0	1276
RTOR Reduction (vph)	35	0	0	0	0	0
Lane Group Flow (vph)	43	0	630	0	0	1276
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		0.21			c0.43
v/s Ratio Perm						
v/c Ratio	0.13		0.30			0.59
Uniform Delay, d1	36.8		6.1			8.4
Progression Factor	1.00		0.29			0.01
Incremental Delay, d2	0.9		0.4			0.8
Delay (s)	37.6		2.1			0.9
Level of Service	D		A			A
Approach Delay (s)	37.6		2.1			0.9
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	2.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	61.0%	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	22	66	0
Future Volume (Veh/h)	0	0	0	22	66	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	26	78	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		79	138
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			16		79	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		892	807
Direction, Lane #	WB 1	NB 1				
Volume Total	26	78				
Volume Left	0	78				
Volume Right	0	0				
cSH	1700	892				
Volume to Capacity	0.02	0.09				
Queue Length 95th (ft)	0	7				
Control Delay (s)	0.0	9.4				
Lane LOS		A				
Approach Delay (s)	0.0	9.4				
Approach LOS		A				
<b>Intersection Summary</b>						
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)	105	59	535	1358
v/c Ratio	0.21	0.15	0.31	0.76
Control Delay	32.1	14.1	10.2	6.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.1	14.1	10.2	6.3
Queue Length 50th (ft)	60	10	90	60
Queue Length 95th (ft)	106	42	120	70
Internal Link Dist (ft)	705		607	132
Turn Bay Length (ft)		25		
Base Capacity (vph)	501	392	1711	1777
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	12	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.21	0.15	0.31	0.76

Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 8: Georgia Ave NW & Euclid St NW

Howard University CMP  
11/24/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	96	54	0	487	1236	0
Future Volume (vph)	96	54	0	487	1236	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)	105	59	0	535	1358	0
RTOR Reduction (vph)	0	28	0	0	0	0
Lane Group Flow (vph)	105	31	0	535	1358	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	c0.06			0.20	c0.49	
v/s Ratio Perm		0.03				
v/c Ratio	0.21	0.08		0.31	0.76	
Uniform Delay, d1	30.7	29.5		9.6	15.1	
Progression Factor	1.00	1.00		1.00	0.24	
Incremental Delay, d2	1.0	0.5		0.5	2.7	
Delay (s)	31.6	29.9		10.1	6.2	
Level of Service	C	C		B	A	
Approach Delay (s)	31.0			10.1	6.2	
Approach LOS	C			B	A	

### Intersection Summary

HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	NBT	SBT
Lane Group Flow (vph)	598	1302
v/c Ratio	0.30	0.73
Control Delay	4.4	10.4
Queue Delay	0.0	0.4
Total Delay	4.4	10.9
Queue Length 50th (ft)	47	222
Queue Length 95th (ft)	62	302
Internal Link Dist (ft)	410	607
Turn Bay Length (ft)		
Base Capacity (vph)	1997	1785
Starvation Cap Reductn	0	89
Spillback Cap Reductn	0	145
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.30	0.79
<b>Intersection Summary</b>		

# HCM Signalized Intersection Capacity Analysis

## 9: Georgia Ave NW & Howard PI NW

Howard University CMP  
11/24/2020

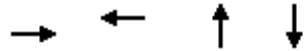


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑↑			↑↑
Traffic Volume (vph)	0	0	485	89	94	1156
Future Volume (vph)	0	0	485	89	94	1156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10
Grade (%)	-10%		5%			-5%
Total Lost time (s)			3.0			3.0
Lane Util. Factor			0.95			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)			2629			2823
Flt Permitted			1.00			0.84
Satd. Flow (perm)			2629			2367
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	505	93	98	1204
RTOR Reduction (vph)	0	0	13	0	0	0
Lane Group Flow (vph)	0	0	585	0	0	1302
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)			1983			1786
v/s Ratio Prot			0.22			
v/s Ratio Perm						c0.55
v/c Ratio			0.29			0.73
Uniform Delay, d1			4.3			7.4
Progression Factor			1.05			1.00
Incremental Delay, d2			0.3			2.7
Delay (s)			4.8			10.0
Level of Service			A			B
Approach Delay (s)	0.0		4.8			10.0
Approach LOS	A		A			B
<b>Intersection Summary</b>						
HCM 2000 Control Delay			8.4		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.59			
Actuated Cycle Length (s)			110.0		Sum of lost time (s)	7.0
Intersection Capacity Utilization			78.4%		ICU Level of Service	D
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	40	52	53	0	34	0	0	0	0	0	0
Future Volume (Veh/h)	80	40	52	53	0	34	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	45	58	60	0	38	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	143	87	181	252	87	96	48			39		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	143	87	181	252	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)	704	745	823	570	746	929	1497			1520		
Direction, Lane #	EB 1	WB 1										
Volume Total	193	98										
Volume Left	90	60										
Volume Right	58	38										
cSH	746	670										
Volume to Capacity	0.26	0.15										
Queue Length 95th (ft)	26	13										
Control Delay (s)	11.5	11.3										
Lane LOS	B	B										
Approach Delay (s)	11.5	11.3										
Approach LOS	B	B										
<b>Intersection Summary</b>												
Average Delay		11.4										
Intersection Capacity Utilization		17.3%		ICU Level of Service						A		
Analysis Period (min)		15										



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	26	27	319	677
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	185
Queue Length 95th (ft)	40	43	76	265
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	223	44	17	563	56
Future Volume (vph)	18	1	6	22	1	3	33	223	44	17	563	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			1403			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	237	47	18	599	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	313	0	0	674	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			0.52	
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			1.5	
Delay (s)		43.1			44.5			4.6			8.5	
Level of Service		D			D			A			A	
Approach Delay (s)		43.1			44.5			4.6			8.5	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.1	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	58.8%	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)	133	157	33	15	233	41	29	793
v/c Ratio	0.31	0.42	0.10	0.05	0.24	0.06	0.06	0.41
Control Delay	31.1	34.0	9.7	9.0	10.1	2.8	8.8	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.1	34.0	9.7	9.0	10.1	2.8	8.8	11.2
Queue Length 50th (ft)	71	87	0	4	68	0	8	135
Queue Length 95th (ft)	125	151	23	13	108	13	20	175
Internal Link Dist (ft)	139	246			167			404
Turn Bay Length (ft)			100	110		100	95	
Base Capacity (vph)	432	377	342	283	987	687	508	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	0.31	0.42	0.10	0.05	0.24	0.06	0.06	0.41
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	81	1	46	104	31	14	221	39	28	678	75	
Future Volume (vph)	45	81	1	46	104	31	14	221	39	28	678	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		0.96			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		0.98			0.98	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)		1585			1350	1021	1434	1598	1087	1328	3143		
Flt Permitted		0.86			0.88	1.00	0.30	1.00	1.00	0.59	1.00		
Satd. Flow (perm)		1381			1205	1021	459	1598	1087	823	3143		
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	85	1	48	109	33	15	233	41	29	714	79	
RTOR Reduction (vph)	0	0	0	0	0	23	0	0	16	0	8	0	
Lane Group Flow (vph)	0	133	0	0	157	10	15	233	25	29	785	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)		433			377	320	283	987	671	508	1942		
v/s Ratio Prot								0.15			c0.25		
v/s Ratio Perm		0.10			c0.13	0.01	0.03		0.02	0.04			
v/c Ratio		0.31			0.42	0.03	0.05	0.24	0.04	0.06	0.40		
Uniform Delay, d1		28.7			29.8	26.2	8.3	9.4	8.2	8.3	10.7		
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2		1.8			3.4	0.2	0.4	0.6	0.1	0.2	0.6		
Delay (s)		30.5			33.2	26.4	8.6	10.0	8.3	8.5	11.3		
Level of Service		C			C	C	A	A	A	A	B		
Approach Delay (s)		30.5			32.0			9.7			11.2		
Approach LOS		C			C			A			B		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			15.4		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.41										
Actuated Cycle Length (s)			110.0		Sum of lost time (s)						7.5		
Intersection Capacity Utilization			53.8%		ICU Level of Service						A		
Analysis Period (min)			15										

c Critical Lane Group



Lane Group	EBL	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	117	88	503	932	243
v/c Ratio	0.43	0.56	0.52	1.05	0.42
Control Delay	34.7	22.8	8.2	58.2	2.4
Queue Delay	0.0	0.0	0.7	0.0	0.0
Total Delay	34.7	22.8	8.9	58.2	2.4
Queue Length 50th (ft)	57	15	79	~722	4
Queue Length 95th (ft)	115	m20	m112	#969	m18
Internal Link Dist (ft)	494		293	410	
Turn Bay Length (ft)		125			
Base Capacity (vph)	274	156	970	886	579
Starvation Cap Reductn	0	0	191	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.43	0.56	0.65	1.05	0.42

**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)	77	37	86	493	913	238
Future Volume (vph)	77	37	86	493	913	238
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	0.89		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)	1093		1370	1483	1573	862
Flt Permitted	0.97		0.08	1.00	1.00	1.00
Satd. Flow (perm)	1093		117	1483	1573	862
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	79	38	88	503	932	243
RTOR Reduction (vph)	16	0	0	0	0	94
Lane Group Flow (vph)	101	0	88	503	932	149
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)	258		156	970	886	485
v/s Ratio Prot	c0.09		0.04	c0.34	c0.59	
v/s Ratio Perm			0.33			0.17
v/c Ratio	0.39		0.56	0.52	1.05	0.31
Uniform Delay, d1	35.3		40.7	9.9	24.0	12.7
Progression Factor	1.00		0.61	0.72	0.67	0.35
Incremental Delay, d2	4.4		6.1	0.8	39.6	1.1
Delay (s)	39.8		31.1	8.0	55.5	5.5
Level of Service	D		C	A	E	A
Approach Delay (s)	39.8			11.4	45.2	
Approach LOS	D			B	D	

Intersection Summary			
HCM 2000 Control Delay	34.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		

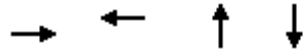
c Critical Lane Group

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)	52	0	0	0	23	60
Future Volume (vph)	52	0	0	0	23	60
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	57	0	0	0	25	66
Direction, Lane #	WB 1	SB 1				
Volume Total (vph)	57	91				
Volume Left (vph)	57	25				
Volume Right (vph)	0	0				
Hadj (s)	0.27	0.13				
Departure Headway (s)	4.4	4.2				
Degree Utilization, x	0.07	0.11				
Capacity (veh/h)	803	844				
Control Delay (s)	7.7	7.6				
Approach Delay (s)	7.7	7.6				
Approach LOS	A	A				
<b>Intersection Summary</b>						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			29.1%		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	322	604
v/c Ratio	0.09	0.01	0.33	0.54
Control Delay	28.7	31.7	1.3	6.0
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	6	103
Queue Length 95th (ft)	26	9	5	123
Internal Link Dist (ft)	696	244	287	403
Turn Bay Length (ft)				
Base Capacity (vph)	184	226	963	1124
Starvation Cap Reductn	0	0	299	0
Spillback Cap Reductn	0	0	0	11
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.09	0.01	0.48	0.54
Intersection Summary				

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)	8	1	6	1	1	1	32	268	3	1	531	36
Future Volume (vph)	8	1	6	1	1	1	32	268	3	1	531	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			1503	
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	285	3	1	565	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	322	0	0	602	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			1120	
v/s Ratio Prot												
v/s Ratio Perm		c0.01			0.00			0.25			c0.40	
v/c Ratio		0.06			0.01			0.33			0.54	
Uniform Delay, d1		35.6			35.3			4.7			5.9	
Progression Factor		1.00			1.00			0.09			0.72	
Incremental Delay, d2		0.7			0.1			0.9			1.6	
Delay (s)		36.3			35.3			1.3			5.9	
Level of Service		D			D			A			A	
Approach Delay (s)		36.3			35.3			1.3			5.9	
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	62.7%	ICU Level of Service	B
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)	705	64	111	952
v/c Ratio	0.90	0.12	0.24	0.81
Control Delay	25.9	8.7	1.8	6.9
Queue Delay	0.1	0.0	0.0	1.4
Total Delay	26.0	8.7	1.8	8.3
Queue Length 50th (ft)	97	8	4	33
Queue Length 95th (ft)	#687	m27	m3	m29
Internal Link Dist (ft)	279			293
Turn Bay Length (ft)		100	125	
Base Capacity (vph)	786	521	460	1171
Starvation Cap Reductn	1	0	0	82
Spillback Cap Reductn	0	0	0	87
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.90	0.12	0.24	0.88

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	642	58	101	866
Future Volume (vph)	0	0	642	58	101	866
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	0.77	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)			1491	989	1480	1543
Flt Permitted			1.00	1.00	0.18	1.00
Satd. Flow (perm)			1491	989	284	1543
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	705	64	111	952
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	705	64	111	952
Confl. Peds. (#/hr)	39	40		46	46	
Heavy Vehicles (%)	2%	2%	6%	5%	4%	5%
Turn Type			NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases				2	6	
Actuated Green, G (s)			56.0	56.0	81.5	81.5
Effective Green, g (s)			58.0	58.0	83.5	83.5
Actuated g/C Ratio			0.53	0.53	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)			786	521	460	1171
v/s Ratio Prot			c0.47		0.05	c0.62
v/s Ratio Perm				0.06	0.13	
v/c Ratio			0.90	0.12	0.24	0.81
Uniform Delay, d1			23.3	13.1	9.5	8.3
Progression Factor			0.47	0.61	0.40	0.49
Incremental Delay, d2			13.3	0.4	0.4	2.3
Delay (s)			24.3	8.5	4.3	6.3
Level of Service			C	A	A	A
Approach Delay (s)	0.0		23.0			6.1
Approach LOS	A		C			A

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

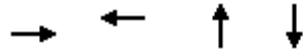
c Critical Lane Group

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	132	19	0	0	0	0	0	4	41	67	0
Future Volume (Veh/h)	0	132	19	0	0	0	0	0	4	41	67	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	155	22	0	0	0	0	0	5	48	79	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			195			244	231	216	250	242	68
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	47			195			244	231	216	250	242	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	87	100
cM capacity (veh/h)	1499			1357			595	633	812	635	623	940
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	177	5	127									
Volume Left	0	0	48									
Volume Right	22	5	0									
cSH	1700	812	627									
Volume to Capacity	0.10	0.01	0.20									
Queue Length 95th (ft)	0	0	19									
Control Delay (s)	0.0	9.5	12.2									
Lane LOS		A	B									
Approach Delay (s)	0.0	9.5	12.2									
Approach LOS		A	B									
Intersection Summary												
Average Delay			5.2									
Intersection Capacity Utilization			40.9%		ICU Level of Service				A			
Analysis Period (min)			15									



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	198	175	259	595
v/c Ratio	0.63	0.69	0.30	0.71
Control Delay	49.0	37.8	3.4	11.7
Queue Delay	0.0	0.1	3.1	0.3
Total Delay	49.0	37.8	6.5	12.0
Queue Length 50th (ft)	103	72	0	150
Queue Length 95th (ft)	177	#177	m0	189
Internal Link Dist (ft)	690	359	289	287
Turn Bay Length (ft)				
Base Capacity (vph)	315	254	874	840
Starvation Cap Reductn	0	0	506	0
Spillback Cap Reductn	0	1	0	31
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.63	0.69	0.70	0.74

**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)	31	70	79	88	0	71	0	215	21	38	503	0
Future Volume (vph)	31	70	79	88	0	71	0	215	21	38	503	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		0.84			0.79			0.95			1.00	
Flpb, ped/bikes		0.96			0.92			1.00			0.98	
Frt		0.94			0.94			0.99			1.00	
Flt Protected		0.99			0.97			1.00			1.00	
Satd. Flow (prot)		1029			1004			1474			1472	
Flt Permitted		0.93			0.69			1.00			0.96	
Satd. Flow (perm)		964			708			1474			1423	
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)	34	77	87	97	0	78	0	236	23	42	553	0
RTOR Reduction (vph)	0	26	0	0	42	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	172	0	0	133	0	0	256	0	0	595	0
Confl. Peds. (#/hr)	101		75	75		101	50		159	159		50
Heavy Vehicles (%)	10%	3%	6%	10%	2%	6%	2%	2%	5%	8%	2%	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)		31.0			31.0			63.0			63.0	
Effective Green, g (s)		33.0			33.0			65.0			65.0	
Actuated g/C Ratio		0.30			0.30			0.59			0.59	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		289			212			871			840	
v/s Ratio Prot								0.17				
v/s Ratio Perm		0.18			c0.19						c0.42	
v/c Ratio		0.60			0.63			0.29			0.71	
Uniform Delay, d1		32.8			33.2			11.1			15.8	
Progression Factor		1.44			1.00			0.25			0.44	
Incremental Delay, d2		8.7			13.2			0.6			4.4	
Delay (s)		55.8			46.4			3.4			11.3	
Level of Service		E			D			A			B	
Approach Delay (s)		55.8			46.4			3.4			11.3	
Approach LOS		E			D			A			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			21.8									C
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			110.0							10.0		
Intersection Capacity Utilization			85.2%									E
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	171	227	528	890
v/c Ratio	0.00	0.48	0.40	0.60	0.97
Control Delay	0.0	38.8	10.3	19.8	25.5
Queue Delay	0.0	0.0	0.1	0.8	40.7
Total Delay	0.0	38.8	10.3	20.7	66.2
Queue Length 50th (ft)	0	99	21	204	76
Queue Length 95th (ft)	0	m170	m78	230	#873
Internal Link Dist (ft)	74			370	279
Turn Bay Length (ft)			190		
Base Capacity (vph)	506	359	568	876	915
Starvation Cap Reductn	0	0	0	134	37
Spillback Cap Reductn	0	0	16	111	153
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.00	0.48	0.41	0.71	1.17

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  
 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	164	0	218	0	507	0	0	854	0
Future Volume (vph)	1	0	1	164	0	218	0	507	0	0	854	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		0.94		1.00		0.93		1.00			1.00	
Flpb, ped/bikes		0.97		0.91		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)		1400		1290		1202		1484			1550	
Flt Permitted		0.98		0.76		1.00		1.00			1.00	
Satd. Flow (perm)		1400		1027		1202		1484			1550	
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)	1	0	1	171	0	227	0	528	0	0	890	0
RTOR Reduction (vph)	0	1	0	0	0	148	0	0	0	0	0	0
Lane Group Flow (vph)	0	1	0	171	0	79	0	528	0	0	890	0
Confl. Peds. (#/hr)	17		29	29		17			39	39		
Heavy Vehicles (%)	2%	2%	2%	6%	2%	4%	2%	7%	2%	2%	4%	2%
Turn Type	Perm	NA		Perm		Perm		NA			NA	
Protected Phases		8						2				6
Permitted Phases	8			4		4						
Actuated Green, G (s)		36.5		36.5		36.5		63.0			63.0	
Effective Green, g (s)		38.5		38.5		38.5		65.0			65.0	
Actuated g/C Ratio		0.35		0.35		0.35		0.59			0.59	
Clearance Time (s)		5.0		5.0		5.0		5.5			5.5	
Lane Grp Cap (vph)		490		359		420		876			915	
v/s Ratio Prot								0.36			c0.57	
v/s Ratio Perm		0.00		c0.17		0.07						
v/c Ratio		0.00		0.48		0.19		0.60			0.97	
Uniform Delay, d1		23.2		27.9		24.9		14.3			21.6	
Progression Factor		1.00		1.20		2.35		1.18			0.28	
Incremental Delay, d2		0.0		4.3		1.0		2.2			16.5	
Delay (s)		23.3		37.7		59.6		19.1			22.6	
Level of Service		C		D		E		B			C	
Approach Delay (s)		23.3			50.2			19.1			22.6	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	73.4%	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	287	3	0	88
Future Volume (Veh/h)	0	0	287	3	0	88
Sign Control		Free	Free		Stop	
Grade		0%	1%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	0	330	3	0	101
Pedestrians		21	21		30	
Lane Width (ft)		0.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	2		3	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		382	771			
pX, platoon unblocked						
vC, conflicting volume	363				382	382
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	363				382	382
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	84
cM capacity (veh/h)	1166				594	642
Direction, Lane #	WB 1	SB 1				
Volume Total	333	101				
Volume Left	0	0				
Volume Right	3	101				
cSH	1700	642				
Volume to Capacity	0.20	0.16				
Queue Length 95th (ft)	0	14				
Control Delay (s)	0.0	11.7				
Lane LOS		B				
Approach Delay (s)	0.0	11.7				
Approach LOS		B				
<b>Intersection Summary</b>						
Average Delay			2.7			
Intersection Capacity Utilization			34.4%	ICU Level of Service		A
Analysis Period (min)			15			



Lane Group	NBT	SBT	SBR
Lane Group Flow (vph)	287	444	267
v/c Ratio	0.72	0.63	0.43
Control Delay	46.4	18.2	3.0
Queue Delay	0.1	2.8	0.5
Total Delay	46.5	21.0	3.4
Queue Length 50th (ft)	181	182	8
Queue Length 95th (ft)	#283	270	m15
Internal Link Dist (ft)	301	289	
Turn Bay Length (ft)			110
Base Capacity (vph)	400	705	623
Starvation Cap Reductn	0	159	105
Spillback Cap Reductn	3	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.72	0.81	0.52

**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	23	241	9	16	406	254
Future Volume (vph)	0	0	0	0	0	0	23	241	9	16	406	254
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	0.85
Flpb, ped/bikes								1.00			1.00	1.00
Frt								1.00			1.00	0.85
Flt Protected								1.00			1.00	1.00
Satd. Flow (prot)								1374			1574	1137
Flt Permitted								1.00			0.98	1.00
Satd. Flow (perm)								1374			1551	1137
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)	0	0	0	0	0	0	24	254	9	17	427	267
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	0	0	0	106
Lane Group Flow (vph)	0	0	0	0	0	0	0	286	0	0	444	161
Confl. Peds. (#/hr)	6		15	15			6	21		11	11	21
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	4%	2%	10%	6%	3%	4%
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)								30.0			48.0	48.0
Effective Green, g (s)								32.0			50.0	50.0
Actuated g/C Ratio								0.29			0.45	0.45
Clearance Time (s)								5.0			5.0	5.0
Lane Grp Cap (vph)								399			705	516
v/s Ratio Prot								c0.21				
v/s Ratio Perm											c0.29	0.14
v/c Ratio								0.72			0.63	0.31
Uniform Delay, d1								34.9			22.9	19.1
Progression Factor								1.00			0.64	0.25
Incremental Delay, d2								10.6			3.0	1.1
Delay (s)								45.5			17.7	5.8
Level of Service								D			B	A
Approach Delay (s)		0.0			0.0			45.5			13.3	
Approach LOS		A			A			D			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			22.5									C
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			110.0							12.0		
Intersection Capacity Utilization			42.3%									A
Analysis Period (min)			15									
c Critical Lane Group												



Lane Group	EBT	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	91	108	23	522	14	957	176
v/c Ratio	0.28	0.27	0.06	0.73	0.02	0.99	0.22
Control Delay	28.2	32.2	8.1	22.4	2.1	32.5	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	35.4	0.0
Total Delay	28.2	32.2	8.1	22.4	2.1	67.9	1.0
Queue Length 50th (ft)	41	59	0	201	0	563	3
Queue Length 95th (ft)	87	107	16	m274	m1	m#806	m2
Internal Link Dist (ft)	191	145		200		370	
Turn Bay Length (ft)					115		150
Base Capacity (vph)	325	405	374	711	649	965	816
Starvation Cap Reductn	0	0	0	0	0	92	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.27	0.06	0.73	0.02	1.10	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

Howard University CMP

22: Georgia Ave NW & V ST NW

11/24/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕		↕	↕		↕	↕
Traffic Volume (vph)	34	30	19	40	58	21	27	448	13	21	850	160
Future Volume (vph)	34	30	19	40	58	21	27	448	13	21	850	160
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		0.99			1.00	0.91		1.00	0.81		1.00	0.92
Flpb, ped/bikes		0.98			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		0.98			0.98	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)		1227			1579	1213		1495	1000		1532	1209
Flt Permitted		0.87			0.87	1.00		0.74	1.00		0.98	1.00
Satd. Flow (perm)		1085			1394	1213		1110	1000		1506	1209
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)	37	33	21	44	64	23	30	492	14	23	934	176
RTOR Reduction (vph)	0	10	0	0	0	16	0	0	5	0	0	42
Lane Group Flow (vph)	0	81	0	0	108	7	0	522	9	0	957	134
Confl. Peds. (#/hr)	21		13	13		21	22		46	46		22
Heavy Vehicles (%)	6%	2%	10%	10%	2%	10%	4%	6%	10%	5%	5%	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)		30.0			30.0	30.0		68.5	68.5		68.5	68.5
Effective Green, g (s)		32.0			32.0	32.0		70.5	70.5		70.5	70.5
Actuated g/C Ratio		0.29			0.29	0.29		0.64	0.64		0.64	0.64
Clearance Time (s)		5.5			5.5	5.5		6.0	6.0		6.0	6.0
Lane Grp Cap (vph)		315			405	352		711	640		965	774
v/s Ratio Prot												
v/s Ratio Perm		0.07			0.08	0.01		0.47	0.01		0.64	0.11
v/c Ratio		0.26			0.27	0.02		0.73	0.01		0.99	0.17
Uniform Delay, d1		29.9			30.0	27.8		13.4	7.2		19.5	8.0
Progression Factor		1.00			1.00	1.00		1.25	1.50		0.57	0.21
Incremental Delay, d2		2.0			1.6	0.1		4.3	0.0		19.0	0.3
Delay (s)		31.9			31.6	27.9		21.0	10.7		30.1	2.0
Level of Service		C			C	C		C	B		C	A
Approach Delay (s)		31.9			30.9			20.7			25.7	
Approach LOS		C			C			C			C	

## Intersection Summary

HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

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

Howard University CMP  
 11/24/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↔			↔
Traffic Volume (veh/h)	0	0	487	45	24	884
Future Volume (Veh/h)	0	0	487	45	24	884
Sign Control	Stop		Free		Free	
Grade	0%		1%		-2%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	513	47	25	931
Pedestrians	144		1		2	
Lane Width (ft)	0.0		12.0		12.0	
Walking Speed (ft/s)	4.0		4.0		4.0	
Percent Blockage	0		0		0	
Right turn flare (veh)						
Median type			None		None	
Median storage veh						
Upstream signal (ft)			259		280	
pX, platoon unblocked	0.50	0.79			0.79	
vC, conflicting volume	1662	682			704	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	883	467			494	
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			97	
cM capacity (veh/h)	153	471			846	
Direction, Lane #	NB 1	SB 1				
Volume Total	560	956				
Volume Left	0	25				
Volume Right	47	0				
cSH	1700	846				
Volume to Capacity	0.33	0.03				
Queue Length 95th (ft)	0	2				
Control Delay (s)	0.0	0.8				
Lane LOS	A					
Approach Delay (s)	0.0	0.8				
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization			83.8%		ICU Level of Service	E
Analysis Period (min)			15			



Lane Group	EBT	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	415	892	318	298	515	65
v/c Ratio	0.34	0.76	0.91	0.69	0.68	0.11
Control Delay	22.2	31.9	70.7	25.2	19.1	5.5
Queue Delay	0.0	0.0	0.0	0.0	1.0	0.0
Total Delay	22.2	31.9	70.7	25.2	20.1	5.5
Queue Length 50th (ft)	101	275	218	96	152	4
Queue Length 95th (ft)	141	357	#386	m103	m158	m6
Internal Link Dist (ft)	189	477	172		179	
Turn Bay Length (ft)				100		160
Base Capacity (vph)	1207	1172	349	430	753	619
Starvation Cap Reductn	0	0	0	0	80	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.76	0.91	0.69	0.77	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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑		↑	↑	↑
Traffic Volume (vph)	0	370	36	0	674	200	0	310	2	292	505	64
Future Volume (vph)	0	370	36	0	674	200	0	310	2	292	505	64
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		0.99			0.99			1.00		1.00	1.00	0.88
Flpb, ped/bikes		1.00			1.00			1.00		0.97	1.00	1.00
Frt		0.99			0.97			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)		2825			2744			1325		1461	1507	1177
Flt Permitted		1.00			1.00			1.00		0.28	1.00	1.00
Satd. Flow (perm)		2825			2744			1325		426	1507	1177
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	378	37	0	688	204	0	316	2	298	515	65
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	31
Lane Group Flow (vph)	0	415	0	0	892	0	0	318	0	298	515	35
Confl. Peds. (#/hr)	13		26	26		13	64		251	251		64
Heavy Vehicles (%)	2%	8%	10%	2%	9%	7%	2%	7%	10%	2%	7%	3%
Parking (#/hr)								0	0			
Turn Type		NA			NA			NA		pm+pt	NA	Perm
Protected Phases		6			2			8		7	4	
Permitted Phases										4		4
Actuated Green, G (s)		45.0			45.0			27.0		53.0	53.0	53.0
Effective Green, g (s)		47.0			47.0			29.0		55.0	55.0	55.0
Actuated g/C Ratio		0.43			0.43			0.26		0.50	0.50	0.50
Clearance Time (s)		6.0			6.0			6.0		5.0	6.0	6.0
Lane Grp Cap (vph)		1207			1172			349		429	753	588
v/s Ratio Prot		0.15			c0.33			c0.24		c0.15	0.34	
v/s Ratio Perm										0.20		0.03
v/c Ratio		0.34			0.76			0.91		0.69	0.68	0.06
Uniform Delay, d1		21.1			26.7			39.3		19.1	20.9	14.2
Progression Factor		1.00			1.00			1.00		1.25	0.80	1.27
Incremental Delay, d2		0.8			4.7			30.2		3.1	1.7	0.1
Delay (s)		21.9			31.4			69.4		27.1	18.4	18.1
Level of Service		C			C			E		C	B	B
Approach Delay (s)		21.9			31.4			69.4			21.3	
Approach LOS		C			C			E			C	

Intersection Summary		
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.79	
Actuated Cycle Length (s)	110.0	Sum of lost time (s) 11.0
Intersection Capacity Utilization	74.4%	ICU Level of Service D
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	180	46	27	2	592	0	0	1166	13
Future Volume (Veh/h)	0	0	0	180	46	27	2	592	0	0	1166	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	0	191	49	29	2	630	0	0	1240	14
Pedestrians		55			24			9			10	
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			2			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								557			210	
pX, platoon unblocked	0.75	0.75	0.72	0.75	0.75	0.95	0.72			0.95		
vC, conflicting volume	1684	1960	691	1287	1967	349	1309			654		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	940	1309	0	408	1318	210	659			531		
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	49	57	96	100			100		
cM capacity (veh/h)	102	115	777	377	114	735	668			961		
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2							
Volume Total	269	212	420	827	427							
Volume Left	191	2	0	0	0							
Volume Right	29	0	0	0	14							
cSH	275	668	1700	1700	1700							
Volume to Capacity	0.98	0.00	0.25	0.49	0.25							
Queue Length 95th (ft)	241	0	0	0	0							
Control Delay (s)	88.7	0.1	0.0	0.0	0.0							
Lane LOS	F	A										
Approach Delay (s)	88.7	0.0		0.0								
Approach LOS	F											
<b>Intersection Summary</b>												
Average Delay			11.1									
Intersection Capacity Utilization			65.4%		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	
Traffic Volume (vph)	14	31	4	10	41	142	5	161	8	95	191	11
Future Volume (vph)	14	31	4	10	41	142	5	161	8	95	191	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	34	4	11	45	154	5	175	9	103	208	12
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total (vph)	53	210	189	103	220							
Volume Left (vph)	15	11	5	103	0							
Volume Right (vph)	4	154	9	0	12							
Hadj (s)	0.05	-0.35	0.08	0.53	0.12							
Departure Headway (s)	5.6	4.9	5.2	6.0	5.6							
Degree Utilization, x	0.08	0.29	0.28	0.17	0.34							
Capacity (veh/h)	573	671	649	577	623							
Control Delay (s)	9.1	9.9	10.2	9.0	10.2							
Approach Delay (s)	9.1	9.9	10.2	9.8								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay			9.9									
Level of Service			A									
Intersection Capacity Utilization			48.8%	ICU Level of Service	A							
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)	1	1	9	20	2	25	4	209	49	13	110	3
Future Volume (vph)	1	1	9	20	2	25	4	209	49	13	110	3
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)	1	1	10	22	2	27	4	225	53	14	118	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	12	51	282	135								
Volume Left (vph)	1	22	4	14								
Volume Right (vph)	10	27	53	3								
Hadj (s)	-0.34	-0.20	0.00	0.16								
Departure Headway (s)	4.6	4.6	4.2	4.5								
Degree Utilization, x	0.02	0.07	0.33	0.17								
Capacity (veh/h)	707	704	837	770								
Control Delay (s)	7.6	8.0	9.3	8.4								
Approach Delay (s)	7.6	8.0	9.3	8.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.8									
Level of Service			A									
Intersection Capacity Utilization			34.8%	ICU Level of Service	A							
Analysis Period (min)			15									

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	7	5	19	116	23	67	239	2	6	296	101
Future Volume (vph)	23	7	5	19	116	23	67	239	2	6	296	101
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)	25	8	5	20	125	25	72	257	2	6	318	109

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	38	170	331	433
Volume Left (vph)	25	20	72	6
Volume Right (vph)	5	25	2	109
Hadj (s)	0.12	-0.02	0.09	-0.07
Departure Headway (s)	6.3	5.9	5.2	5.0
Degree Utilization, x	0.07	0.28	0.48	0.60
Capacity (veh/h)	465	547	650	702
Control Delay (s)	9.8	11.1	13.0	15.0
Approach Delay (s)	9.8	11.1	13.0	15.0
Approach LOS	A	B	B	B

















Intersection Summary			
Delay		13.4	
Level of Service		B	
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
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	187	4	11	67
Future Volume (Veh/h)	0	0	187	4	11	67
Sign Control	Free		Stop			Stop
Grade	0%		0%			0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	0	201	4	12	72
Pedestrians	11		68			130
Lane Width (ft)	0.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		6			11
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	68		198	79	246	198
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	68		198	79	246	198
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		66	100	97	88
cM capacity (veh/h)	1446		587	926	409	587
Direction, Lane #	NB 1	SB 1				
Volume Total	205	84				
Volume Left	0	12				
Volume Right	4	0				
cSH	591	552				
Volume to Capacity	0.35	0.15				
Queue Length 95th (ft)	39	13				
Control Delay (s)	14.3	12.7				
Lane LOS	B	B				
Approach Delay (s)	14.3	12.7				
Approach LOS	B	B				
<b>Intersection Summary</b>						
Average Delay			13.8			
Intersection Capacity Utilization			34.2%	ICU Level of Service	A	
Analysis Period (min)			15			

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

												
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	53	22	23	39	49	17	83	95	40	38	13
Future Volume (vph)	6	53	22	23	39	49	17	83	95	40	38	13
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)	7	59	24	26	43	54	19	92	106	44	42	14
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	90	123	217	100								
Volume Left (vph)	7	26	19	44								
Volume Right (vph)	24	54	106	14								
Hadj (s)	-0.11	-0.16	-0.24	0.05								
Departure Headway (s)	4.7	4.6	4.3	4.7								
Degree Utilization, x	0.12	0.16	0.26	0.13								
Capacity (veh/h)	706	725	796	714								
Control Delay (s)	8.3	8.4	8.8	8.4								
Approach Delay (s)	8.3	8.4	8.8	8.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.6									
Level of Service			A									
Intersection Capacity Utilization			41.4%	ICU Level of Service	A							
Analysis Period (min)			15									

Queues

1: Georgia Ave NW & Harvard St NW



Lane Group	EBL	EBT	NBT	SBT
Lane Group Flow (vph)	53	562	1130	626
v/c Ratio	0.10	0.49	0.73	0.54
Control Delay	20.4	24.5	19.9	17.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.4	24.5	19.9	17.0
Queue Length 50th (ft)	21	136	258	128
Queue Length 95th (ft)	47	187	342	180
Internal Link Dist (ft)		782	130	228
Turn Bay Length (ft)	60			
Base Capacity (vph)	537	1138	1549	1166
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	0.10	0.49	0.73	0.54

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)	52	495	61	0	0	0	0	862	256	55	564	0
Future Volume (vph)	52	495	61	0	0	0	0	862	256	55	564	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	0.99						0.97			1.00	
Flpb, ped/bikes	0.97	1.00						1.00			1.00	
Frt	1.00	0.98						0.97			1.00	
Flt Protected	0.95	1.00						1.00			1.00	
Satd. Flow (prot)	1396	2933						2818			2960	
Flt Permitted	0.95	1.00						1.00			0.73	
Satd. Flow (perm)	1396	2933						2818			2160	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	53	500	62	0	0	0	0	871	259	56	570	0
RTOR Reduction (vph)	0	10	0	0	0	0	0	28	0	0	0	0
Lane Group Flow (vph)	53	552	0	0	0	0	0	1102	0	0	626	0
Confl. Peds. (#/hr)	22		36	36			22	89		52	52	89
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	3%	3%	2%	4%	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)	36.5	36.5						52.0			52.0	
Effective Green, g (s)	38.5	38.5						54.0			54.0	
Actuated g/C Ratio	0.38	0.38						0.54			0.54	
Clearance Time (s)	6.0	6.0						5.5			5.5	
Lane Grp Cap (vph)	537	1129						1521			1166	
v/s Ratio Prot		c0.19						c0.39				
v/s Ratio Perm	0.04										0.29	
v/c Ratio	0.10	0.49						0.72			0.54	
Uniform Delay, d1	19.7	23.3						17.4			14.9	
Progression Factor	1.00	1.00						1.00			1.00	
Incremental Delay, d2	0.4	1.5						3.0			1.8	
Delay (s)	20.0	24.8						20.4			16.7	
Level of Service	C	C						C			B	
Approach Delay (s)		24.4			0.0			20.4			16.7	
Approach LOS		C			A			C			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			20.5					HCM 2000 Level of Service			C	
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			100.0					Sum of lost time (s)		7.5		
Intersection Capacity Utilization			86.4%					ICU Level of Service		E		
Analysis Period (min)			15									

c Critical Lane Group



Lane Group	EBT	WBL	NBR	SBT
Lane Group Flow (vph)	798	347	500	2
v/c Ratio	0.76	0.43	0.54	0.02
Control Delay	38.8	20.3	13.4	54.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	38.8	20.3	13.4	54.0
Queue Length 50th (ft)	280	143	123	2
Queue Length 95th (ft)	360	263	265	11
Internal Link Dist (ft)	649			121
Turn Bay Length (ft)				
Base Capacity (vph)	1046	816	919	110
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	0.76	0.43	0.54	0.02

#### Intersection Summary

# 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	663	63	316	0	0	0	0	455	1	1	0	
Future Volume (vph)	0	663	63	316	0	0	0	0	455	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)		2839		1540					1547		1472		
Flt Permitted		1.00		0.95					1.00		0.98		
Satd. Flow (perm)		2839		1540					1547		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	729	69	347	0	0	0	0	500	1	1	0	
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	107	0	0	0	
Lane Group Flow (vph)	0	792	0	347	0	0	0	0	394	0	2	0	
Confl. Peds. (#/hr)	1		13	13			1	16				16	
Heavy Vehicles (%)	2%	3%	5%	2%	2%	2%	2%	2%	2%	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)		42.0		58.0					58.0		2.0		
Effective Green, g (s)		44.0		60.0					60.0		4.0		
Actuated g/C Ratio		0.37		0.50					0.50		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)		1040		770					773		49		
v/s Ratio Prot		c0.28		0.23					c0.25				
v/s Ratio Perm											0.00		
v/c Ratio		0.76		0.45					0.51		0.04		
Uniform Delay, d1		33.4		19.4					20.1		56.1		
Progression Factor		1.00		1.00					1.00		1.00		
Incremental Delay, d2		5.3		1.9					2.4		0.1		
Delay (s)		38.7		21.3					22.5		56.3		
Level of Service		D		C					C		E		
Approach Delay (s)		38.7			21.3			22.5			56.3		
Approach LOS		D			C			C			E		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			30.1		HCM 2000 Level of Service					C			
HCM 2000 Volume to Capacity ratio			0.59										
Actuated Cycle Length (s)			120.0		Sum of lost time (s)					12.0			
Intersection Capacity Utilization			68.2%		ICU Level of Service					C			
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)	14	113	15	1032	633	31
Future Volume (Veh/h)	14	113	15	1032	633	31
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	15	120	16	1098	673	33
Pedestrians	79			2	9	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	7			0	1	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				336	431	
pX, platoon unblocked	0.88	0.91	0.91			
vC, conflicting volume	1358	434	785			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	681	184	569			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	83	98			
cM capacity (veh/h)	307	703	851			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	135	382	732	449	257	
Volume Left	15	16	0	0	0	
Volume Right	120	0	0	0	33	
cSH	615	851	1700	1700	1700	
Volume to Capacity	0.22	0.02	0.43	0.26	0.15	
Queue Length 95th (ft)	21	1	0	0	0	
Control Delay (s)	12.5	0.6	0.0	0.0	0.0	
Lane LOS	B	A				
Approach Delay (s)	12.5	0.2		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay	1.0					
Intersection Capacity Utilization	59.3%			ICU Level of Service	B	
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	3	0	0	0	1	1053	22	7	746	1
Future Volume (Veh/h)	2	1	3	0	0	0	1	1053	22	7	746	1
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	3	0	0	0	1	1108	23	7	785	1
Pedestrians		63			67			20				
Lane Width (ft)		12.0			0.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		5			0			2				
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								205			562	
pX, platoon unblocked	0.86	0.86	0.93	0.86	0.86	0.83	0.93			0.83		
vC, conflicting volume	1418	2062	476	1618	2052	632	849			1198		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	809	1554	287	1041	1541	148	688			829		
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)	212	91	615	147	92	724	795			663		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>							
Volume Total	6	555	577	400	394							
Volume Left	2	1	0	7	0							
Volume Right	3	0	23	0	1							
cSH	237	795	1700	663	1700							
Volume to Capacity	0.03	0.00	0.34	0.01	0.23							
Queue Length 95th (ft)	2	0	0	1	0							
Control Delay (s)	20.6	0.0	0.0	0.3	0.0							
Lane LOS	C	A		A								
Approach Delay (s)	20.6	0.0		0.2								
Approach LOS	C											
<b>Intersection Summary</b>												
Average Delay			0.1									
Intersection Capacity Utilization			48.9%		ICU Level of Service					A		
Analysis Period (min)			15									



Lane Group	NBT	SBT
Lane Group Flow (vph)	1114	802
v/c Ratio	0.62	0.46
Control Delay	4.7	13.6
Queue Delay	0.0	0.0
Total Delay	4.7	13.6
Queue Length 50th (ft)	38	163
Queue Length 95th (ft)	37	210
Internal Link Dist (ft)	68	125
Turn Bay Length (ft)		
Base Capacity (vph)	1804	1756
Starvation Cap Reductn	1	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.62	0.46
<b>Intersection Summary</b>		

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	58	1022	728	49
Future Volume (vph)	0	0	58	1022	728	49
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	0.97	
Flpb, ped/bikes				1.00	1.00	
Frt				1.00	0.99	
Flt Protected				1.00	1.00	
Satd. Flow (prot)				2977	2882	
Flt Permitted				0.85	1.00	
Satd. Flow (perm)				2541	2882	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	60	1054	751	51
RTOR Reduction (vph)	0	0	0	0	4	0
Lane Group Flow (vph)	0	0	0	1114	798	0
Confl. Peds. (#/hr)	7	1	99			99
Heavy Vehicles (%)	2%	2%	3%	3%	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)				82.0	71.0	
Effective Green, g (s)				84.0	73.0	
Actuated g/C Ratio				0.70	0.61	
Clearance Time (s)				5.5	5.5	
Lane Grp Cap (vph)				1805	1753	
v/s Ratio Prot				c0.04	0.28	
v/s Ratio Perm				c0.39		
v/c Ratio				0.62	0.46	
Uniform Delay, d1				9.5	12.7	
Progression Factor				0.33	1.00	
Incremental Delay, d2				1.4	0.9	
Delay (s)				4.6	13.6	
Level of Service				A	B	
Approach Delay (s)	0.0			4.6	13.6	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues  
6: Georgia Ave NW & Fairmont St NW



Lane Group	WBL	NBT	SBT
Lane Group Flow (vph)	122	1028	738
v/c Ratio	0.32	0.50	0.35
Control Delay	26.0	8.5	0.5
Queue Delay	0.0	0.2	0.2
Total Delay	26.0	8.6	0.7
Queue Length 50th (ft)	49	87	1
Queue Length 95th (ft)	104	151	1
Internal Link Dist (ft)	247	132	68
Turn Bay Length (ft)			
Base Capacity (vph)	382	2058	2097
Starvation Cap Reductn	0	305	529
Spillback Cap Reductn	0	28	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.32	0.59	0.47
Intersection Summary			

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

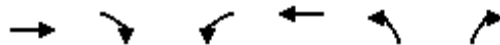


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑↑			↑↑
Traffic Volume (vph)	57	63	1018	0	0	731
Future Volume (vph)	57	63	1018	0	0	731
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0		3.5			3.5
Lane Util. Factor	1.00		0.95			0.95
Frpb, ped/bikes	0.99		1.00			1.00
Flpb, ped/bikes	1.00		1.00			1.00
Frt	0.93		1.00			1.00
Flt Protected	0.98		1.00			1.00
Satd. Flow (prot)	1420		2940			2997
Flt Permitted	0.98		1.00			1.00
Satd. Flow (perm)	1420		2940			2997
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	58	64	1028	0	0	738
RTOR Reduction (vph)	33	0	0	0	0	0
Lane Group Flow (vph)	89	0	1028	0	0	738
Confl. Peds. (#/hr)	44	2		36	36	
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)	27.5		82.0			82.0
Effective Green, g (s)	29.5		84.0			84.0
Actuated g/C Ratio	0.25		0.70			0.70
Clearance Time (s)	5.0		5.5			5.5
Lane Grp Cap (vph)	349		2058			2097
v/s Ratio Prot	c0.06		c0.35			0.25
v/s Ratio Perm						
v/c Ratio	0.25		0.50			0.35
Uniform Delay, d1	36.4		8.3			7.2
Progression Factor	1.00		0.91			0.01
Incremental Delay, d2	1.8		0.8			0.4
Delay (s)	38.2		8.3			0.5
Level of Service	D		A			A
Approach Delay (s)	38.2		8.3			0.5
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	55.4%	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	27	137	0
Future Volume (Veh/h)	0	0	0	27	137	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	32	161	0
Pedestrians	69			250	46	
Lane Width (ft)	0.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			21	4	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	327					
pX, platoon unblocked						
vC, conflicting volume			46		147	296
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			46		147	296
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		80	100
cM capacity (veh/h)			1502		802	566
Direction, Lane #	WB 1	NB 1				
Volume Total	32	161				
Volume Left	0	161				
Volume Right	0	0				
cSH	1700	802				
Volume to Capacity	0.02	0.20				
Queue Length 95th (ft)	0	19				
Control Delay (s)	0.0	10.6				
Lane LOS			B			
Approach Delay (s)	0.0	10.6				
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			8.9			
Intersection Capacity Utilization			23.3%	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)	203	57	845	834
v/c Ratio	0.44	0.14	0.45	0.45
Control Delay	38.9	21.7	10.4	3.1
Queue Delay	0.0	0.0	0.1	0.2
Total Delay	38.9	21.7	10.5	3.3
Queue Length 50th (ft)	129	19	150	32
Queue Length 95th (ft)	203	53	191	41
Internal Link Dist (ft)	705		607	132
Turn Bay Length (ft)		25		
Base Capacity (vph)	460	401	1882	1846
Starvation Cap Reductn	0	0	0	344
Spillback Cap Reductn	0	0	132	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.44	0.14	0.48	0.56

Intersection Summary



# HCM Signalized Intersection Capacity Analysis

## 8: Georgia Ave NW & Euclid St NW

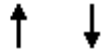
Howard University CMP  
11/24/2020



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	191	54	0	794	784	0
Future Volume (vph)	191	54	0	794	784	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	0.93		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	1357		2824	2770	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	1625	1357		2824	2770	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	203	57	0	845	834	0
RTOR Reduction (vph)	0	17	0	0	0	0
Lane Group Flow (vph)	203	40	0	845	834	0
Confl. Peds. (#/hr)		34	81			81
Heavy Vehicles (%)	2%	2%	2%	2%	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)	32.0	32.0		78.0	78.0	
Effective Green, g (s)	34.0	34.0		80.0	80.0	
Actuated g/C Ratio	0.28	0.28		0.67	0.67	
Clearance Time (s)	5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	460	384		1882	1846	
v/s Ratio Prot	c0.12			0.30	c0.30	
v/s Ratio Perm		0.03				
v/c Ratio	0.44	0.10		0.45	0.45	
Uniform Delay, d1	35.2	31.7		9.5	9.5	
Progression Factor	1.00	1.00		1.00	0.24	
Incremental Delay, d2	3.1	0.5		0.8	0.8	
Delay (s)	38.3	32.3		10.3	3.1	
Level of Service	D	C		B	A	
Approach Delay (s)	37.0			10.3	3.1	
Approach LOS	D			B	A	

### Intersection Summary

HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	NBT	SBT
Lane Group Flow (vph)	864	835
v/c Ratio	0.41	0.47
Control Delay	3.4	6.2
Queue Delay	0.2	0.1
Total Delay	3.6	6.2
Queue Length 50th (ft)	42	99
Queue Length 95th (ft)	m75	132
Internal Link Dist (ft)	410	607
Turn Bay Length (ft)		
Base Capacity (vph)	2129	1777
Starvation Cap Reductn	482	0
Spillback Cap Reductn	0	125
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.52	0.51

**Intersection Summary**

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

# 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	762	67	54	748
Future Volume (vph)	0	0	762	67	54	748
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			0.99			1.00
Flpb, ped/bikes			1.00			1.00
Frt			0.99			1.00
Flt Protected			1.00			1.00
Satd. Flow (prot)			2815			2829
Flt Permitted			1.00			0.83
Satd. Flow (perm)			2815			2355
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	794	70	56	779
RTOR Reduction (vph)	0	0	6	0	0	0
Lane Group Flow (vph)	0	0	858	0	0	835
Confl. Peds. (#/hr)	36	71		21	21	
Heavy Vehicles (%)	2%	2%	2%	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)			2124			1776
v/s Ratio Prot			0.30			
v/s Ratio Perm						c0.35
v/c Ratio			0.40			0.47
Uniform Delay, d1			4.8			5.1
Progression Factor			0.64			1.00
Incremental Delay, d2			0.4			0.9
Delay (s)			3.4			6.0
Level of Service			A			A
Approach Delay (s)	0.0		3.4			6.0
Approach LOS	A		A			A
<b>Intersection Summary</b>						
HCM 2000 Control Delay			4.7		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.38			
Actuated Cycle Length (s)			110.0		Sum of lost time (s)	7.0
Intersection Capacity Utilization			73.0%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis  
 10: 6th St NW & Howard 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)	68	28	53	24	0	17	0	0	0	0	0	0
Future Volume (Veh/h)	68	28	53	24	0	17	0	0	0	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		-13%			-10%			0%			0%	
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)	73	30	57	26	0	18	0	0	0	0	0	0
Pedestrians		194			76			165			171	
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		16			6			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	383	270	359	313	270	247	194			76		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	383	270	359	313	270	247	194			76		
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	3.4	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	81	94	90	94	100	98	100			100		
cM capacity (veh/h)	384	501	568	431	500	733	1156			1427		
Direction, Lane #	EB 1	WB 1										
Volume Total	160	44										
Volume Left	73	26										
Volume Right	57	18										
cSH	457	518										
Volume to Capacity	0.35	0.08										
Queue Length 95th (ft)	39	7										
Control Delay (s)	17.1	12.6										
Lane LOS	C	B										
Approach Delay (s)	17.1	12.6										
Approach LOS	C	B										
<b>Intersection Summary</b>												
Average Delay			16.1									
Intersection Capacity Utilization		16.7%		ICU Level of Service					A			
Analysis Period (min)			15									