



WELLS & ASSOCIATES, LLC

TRAFFIC TRANSPORTATION, and PARKING CONSULTANTS

MEMORANDUM

TO: David Welder
Marge Brown
The Broadway Group

FROM: Martin J. Wells, P.E.
James W. Watson
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DATE: September 1, 2006

SUBJECT: Revised Transportation Impact Analysis for Atlantic North and Atlantic South,
Washington, D.C.

ZONING COMMISSION
District of Columbia

CASE NO. 05-17A/05-32A
EXHIBIT NO. 5

Introduction

This memorandum presents a revised transportation impact analysis for Atlantic North located at 945 Florida Avenue, N.W. (Parcel C), and Atlantic South located at 800-801 V Street, N.W. (Parcels A and D) and 2047 9th Street, N.W. (Parcel B), in Washington, D.C.

This study has been updated to reflect the revised site plan for both projects, which includes the following updated development program

Use	Jan 2006 Density	Updated Program	Difference
<u>Atlantic South</u>			
Parcel A			
Residential	348 D U	367 D U	19 D U
Retail	6,245 S F	6,245 S F	No Change
Parcel B			
Residential	76 D U	92 D U	16 D U
Retail	4,306 S F	4,306 S F	No Change
Parcel D			
Residential	10 D U	0 D U	-10 D U
Retail	1,444 S F	0 S F	-1,444 S F
<u>Atlantic North</u>			
Parcel C			
Residential	266 D U	322 D U	56 D U
Retail	8,839 S F	22,880 S F	14,041 S F
<u>Total</u>			
Residential	700 D U	781 D U	81 D U
Retail	20,834 S F	33,431 S F	12,597 S F

No additional residential square footage is to be added. The 81 additional residential units are to be included within the previously submitted square footage for each parcel. Parcel D has been removed from the development program and is not being considered within this addendum. For convenience purposes, all tables, figures and analyses for Atlantic North are contained in Appendix A, and all figures, tables and analyses for Atlantic South are contained in Appendix B.

ZONING COMMISSION
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CASE NO. 05-17A/05-32A
EXHIBIT NO. 5A1

Note Consistent with the original transportation impact studies for Atlantic North and Atlantic South, dated January 6, 2006 and revised January 25, 2006, the analyses for Atlantic North included Atlantic South as a pipeline development and vice versa

Pipeline Development Trip Generation

The number of peak hour trips that will be generated by the pipeline developments in the vicinity of Atlantic North and Atlantic South were updated based on the revised site plan, and are shown on Tables A-1 and B-1. For Atlantic North, it is estimated that the pipeline developments will generate 176 AM peak hour trips and 285 PM peak hour trips, upon completion. This represents an additional 11 AM peak hour trips and 40 PM peak hour trips to those reported in the January 25, 2006 Addendum. For Atlantic South, it is estimated that the pipeline developments will generate 145 AM peak hour trips and 229 PM peak hour trips, upon completion. This represents an additional 18 AM peak hour trips and 45 PM peak hour trips to those reported in the January 25, 2006 Addendum.

Background Traffic Forecasts

Background peak hour traffic forecasts, without the development of Atlantic North and Atlantic South, were estimated based on the existing traffic counts, traffic generated by the pipeline developments, and the background traffic growth of 0.5 percent per year. The background traffic forecasts for Atlantic North are shown on Figure A-1 in Appendix A, and the background traffic forecasts for Atlantic South are shown on Figure B-1 in Appendix B.

Background Future Levels of Service

Future peak hour levels of service, without the development of Atlantic North and Atlantic South, were estimated at the key intersections in the study area for the year of project buildout (2007) based on the intersection lane usage and traffic control shown on Figure 2-1 of the original reports, dated January 6, 2006, the updated background traffic forecasts shown on Figures A-1 and B-1, and the Highway Capacity Manual.

The results for Atlantic North are summarized on Table A-3, located in Appendix A. The results indicate that the addition of residential units on Parcels A and B for Atlantic South will have minimal effects on the levels of service included in the original and revised transportation impact studies.

The results for Atlantic South are summarized on Table B-3, located in Appendix B. The results indicate that the addition of residential units and retail space on Parcel C for Atlantic North will have minimal effects on the levels of service included in the original and revised transportation impact studies.

Site Trip Generation Analysis

The number of peak hour trips that will be generated by the development of Atlantic North and Atlantic South were updated based on the revised site plan and standard ITE rates and are shown on Tables A-2 and B-2.

Atlantic North (Parcel C) is anticipated to generate 74 net additional AM peak hour trips and 145 net additional PM peak hour trips. This represents an increase of 18 AM peak hour trips and 45 PM peak hour trips to those reported in the January 25, 2006 Addendum.

Atlantic South (Parcel A) is anticipated to generate 64 net additional AM peak hour trips and 105 net additional PM peak hour trips, and Parcel B is anticipated to generate 28 net additional AM peak hour trips and 49 net additional PM peak hour trips. This represents an increase of 3 AM peak hour trips and 4 PM peak hour trips for Parcel A and 3 AM peak hour trips and 4 PM peak hour trips for Parcel B to those reported in the January 25, 2006 Addendum. Parcel D has been removed from the development program.

The revised site-generated traffic volumes for Atlantic North were assigned to the public road network and are shown on Figure A-2 in Appendix A. The revised site-generated traffic volumes for Atlantic South were assigned to the public road network, consistent with previous studies, and are shown on Figure B-2 in Appendix B.

Total Future Traffic Forecasts

Total future peak hour traffic forecasts, with the development of Atlantic North and Atlantic South, were estimated based on the background traffic forecasts and the revised site traffic assignments. The total future traffic forecasts for Atlantic North are shown on Figure A-3 in Appendix A, and the total future traffic forecasts for Atlantic South are shown on Figure B-3 in Appendix B.

Total Future Levels of Service

Future peak hour levels of service, with the development of Atlantic North and Atlantic South, were estimated at the key intersections in the study area for the year of project buildout (2007) based on the intersection lane usage and traffic control shown on Figure 2-1 of the original reports, dated January 6, 2006 and January 25, 2006, the revised total future forecasts shown on Figures A-3 and B-3, and the Highway Capacity Manual.

The results for Atlantic North are summarized on Table A-3, located in Appendix A. The results indicate that the addition of residential units and retail space on Parcel C for Atlantic North will have minimal effects on the levels of service included in the original transportation impact study. The driveway access to the underground parking garage will continue to operate at acceptable LOS "A" during both the AM and PM peak hours.

The results for Atlantic South are summarized on Table B-3, located in Appendix B. The results indicate that the addition of residential units on Parcels A and B for Atlantic South will have virtually no effects on the levels of service included in the original transportation impact study. The driveway accesses to the underground parking garages for Parcels A and B will operate at acceptable LOS "A" and "B" during both the AM and PM peak hours.

Parking Analysis

Per the District of Columbia zoning ordinance minimum parking requirements, Atlantic North and Atlantic South would require 296 parking spaces (260 residential and 35 retail). Within the site, 726 spaces (693 residential and 33 retail) are proposed to be provided. This far exceeds the minimum zoning parking requirements for residential.

This Planned Unit Development (PUD) originally provided one parking space per residential unit. The parking supply would approach this index assuming that residential and retail parking is shared as is typical for this type of mixed use development, yielding an overall parking ratio of .89 spaces per unit. Additionally, other jurisdictions recognize that one-bedroom and efficiency units necessitate less parking than two-bedroom units. Since the overall mix of the project has more one-bedroom (69 percent) units than two-bedroom units (31 percent) within Atlantic North and Atlantic South, it is more likely that less parking would be needed onsite.

Traffic Circle Feasibility Analysis

Consistent with previous studies and the DC Department of Transportation (DDOT) and Office of Planning's (OP) proposed traffic circle at the Florida Avenue/Sherman Avenue/University Dorms/Bryant Street Extension intersection, the revised pipeline and site-generated trips for Atlantic North and Atlantic South were redistributed based on the extension of Bryant and W Streets, and were added to the redistributed existing traffic contained in the original transportation impact study. Appendix C contains figures showing the revised redistributed background and total future peak hour volumes for the proposed traffic circle.

Using AASidra's roundabout analysis method, the traffic circle was analyzed under background and total future conditions and the results are shown on Tables C-1 and C-2 in Appendix C. The results indicate that with the addition of residential units on Parcels A, B, and C, the traffic circle will continue to operate at overall

acceptable LOS “B” and “A” during the AM and PM peak hours under background and total future conditions, as demonstrated in the original transportation impact study

Loading Analysis

Additional space for Atlantic North is planned and is anticipated to accommodate 30-foot design vehicles. Swept-path diagrams illustrating the ability of these vehicles to enter and exit this space are contained in Appendix D.

Questions and comments regarding this document should be directed to Wells & Associates.

Q:\Projects\2501_3000\2799 Atlantic Plumbing Site\Documents\Reports\Atlantic Addendum (9.1.06).doc

Appendix A

Atlantic North Tables, Figures, And Analyses

Table A-1
Atlantic North
Pipeline Developments Site Trip Generation Analysis (August 2006 Addendum)

Land Use	Land Use Code	Size	Units	AM Peak Hour			PM Peak Hour			Average Daily Traffic
				In	Out	Total	In	Out	Total	
The Lincoln Condominium										
Condominiums	230	147	D U	12	58	70	55	27	82	891
Reduction for Transit Use ²		67%		8	39	47	37	18	55	593
Net New Residential Trips				4	19	23	18	9	27	298
The Floridian										
Condominiums	230	118	D U	10	49	59	46	23	69	739
Reduction for Transit Use ²		67%		7	33	39	31	15	46	492
Net New Residential Trips				3	16	20	15	8	23	247
The Rhapsody										
Condominiums	230	162	D U	13	63	76	60	29	89	967
Reduction for Transit Use ²		67%		9	42	51	40	20	59	643
Net New Residential Trips				4	21	25	20	9	30	324
The Brandon										
Condominiums	230	12	D U	2	7	9	7	4	11	106
Reduction for Transit Use ²		67%		1	5	6	5	2	7	71
Net New Residential Trips				1	2	3	2	2	4	35
Atlantic South										
Parcel A										
Existing Atlantic Plumbing Warehouse ³				13	5	18	1	12	13	N/A
Proposed Residential Condominium	230	367	D U	25	121	146	117	58	175	1,938
Reduction for Transit Use ³		50%		12	61	73	59	29	88	969
Net New Residential Trips				13	60	73	58	29	88	969
Proposed Retail	820	6,245	S.F.	18	12	30	48	52	100	1,120
Reduction Transit Use ³		70%		13	8	21	34	36	70	784
Net New Residential Trips				5	4	9	14	16	30	336
Net New Parcel A Site Trips				5	59	64	72	33	105	1,305
Parcel B										
Existing Garage Building ³				1	2	3	2	1	3	
Proposed Residential Condominium	230	92	D.U.	8	40	48	38	18	56	598
Reduction for Transit Use ³		50%		4	20	24	19	9	28	299
Net New Residential Trips				4	20	24	19	9	28	299
Proposed Retail	820	22,880	S.F.	40	25	65	114	123	237	2,604
Reduction Transit Use ³		70%		28	18	46	80	86	166	1,823
Net New Residential Trips				12	8	20	34	37	71	781
Net New Parcel B Site Trips				15	26	41	51	45	96	1,080
Parcel D										
Dumpster Gated Area				0	0	0	0	0	0	
Proposed Residential Condominium	230	0	D U	0	0	0	0	0	0	0
Reduction for Transit Use ³		50%		0	0	0	0	0	0	0
Net New Residential Trips				0	0	0	0	0	0	0
Proposed Retail	820	0	S.F.	0	0	0	0	0	0	0
Reduction Transit Use ³		70%		0	0	0	0	0	0	0
Net New Residential Trips				0	0	0	0	0	0	0
Net New Parcel D Site Trips				0	0	0	0	0	0	0
Total Pipeline Site Generated Trips				33	143	176	179	105	285	3,290

Notes: ¹ Based on Trip Generation, 7th Edition Institute of Transportation Engineers.

² Transit reduction based on "Development Related Ridership Survey II" by JHK & Associates, 1989

³ Trips observed during peak hour traffic counts conducted on Tuesday April 12, 2005

Table A 2
Atlantic North Plumbing Site
Site Trip Generation Analysis ¹ (August 2006 Addendum)

Land Use	Land Use Code	Size	Units	AM Peak Hour			PM Peak Hour			Average Daily Traffic
				In	Out	Total	In	Out	Total	
Existing Development²										
Parcel C										
Existing Atlantic Plumbing Warehouse				7	5	12	5	0	5	N/A
Proposed Development										
Parcel C										
Residential Condominium	230	322 D U		22	110	132	105	52	157	1734
Reduction for Transit Use ³		50%		11	55	66	53	26	79	867
Net New Residential Trips				11	55	66	52	26	79	867
Retail	820	22 880 S F		40	25	65	114	123	237	2604
Reduction Transit Use ³		70%		28	18	46	80	86	166	1823
Net New Retail Trips				12	8	20	34	37	71	781
Total Net New Site-Generated Trips for Parcel C				16	58	74	82	63	145	1648

Notes ¹ Based on Trip Generation, 7th Edition Institute of Transportation Engineers.

² Trips observed during peak hour traffic counts conducted on Tuesday April 12, 2005

³ Transit reduction based on "Development Related Ridership Survey II", by JHK & Associates 1989 and the 2000 US Census

Table A-3

Atlantic North (August 2006 Addendum)Peak Hour Intersection Levels of Service ¹

Intersection		Type of Control	2007 Background Conditions		2007 Total Future Conditions	
			AM	PM	AM	PM
1	Florida Ave /10th St./Barry Place	Stop Sign				
	EBLTR		A[9 9]	A[9 7]	B[10 1]	A[9 9]
	WBLTR		B[12 8]	B[10 8]	B[13 2]	B[11 1]
	NBLTR		B[12 3]	B[12 3]	B[13 2]	B[13 3]
	SBLTR		B[11 0]	B[12 4]	B[11 3]	B[12 9]
2	Barry Place/Sherman Avenue	Signal				
	EB		A(7 4)	A(8 2)	A(7 4)	A(8 2)
	WB		A(6 7)	A(6 9)	A(6 7)	A(6 9)
	NB		C(34 7)	F(160 0)	C(34 7)	F(160 0)
	SB		<u>F(317.3)</u>	<u>F(134.8)</u>	<u>F(317.3)</u>	<u>F(134.8)</u>
	Overall		F(209 1)	F(118 1)	F(209 1)	F(118 1)
3	9th Street/Barry Place	Stop Sign				
	EBLT		A[9 1]	A[9 5]	A[9 1]	A[9 5]
	WBTR		A[8 6]	A[8 7]	A[8 6]	A[8 7]
	SBLR		A[7 5]	A[7 6]	A[7 5]	A[7 6]
4	8th Street/Barry Place	Stop Sign				
	WBLT		A[0 5]	A[0 7]	A[0 5]	A[0 7]
	NBLR		B[10 8]	B[10 9]	B[10 8]	B[10 9]
5	Barry Place/Georgia Avenue	Signal				
	EB		E(58 7)	F(153 1)	E(58 7)	F(153 1)
	NB		A(5 3)	A(5 9)	A(5 3)	A(6 0)
	SB		<u>C(22.9)</u>	<u>C(21.1)</u>	<u>C(22.9)</u>	<u>C(21.2)</u>
	Overall		C(21 1)	C(30 7)	C(21 1)	C(30 7)
6	Florida Avenue/Sherman Avenue	Signal				
	NB		D(39 9)	D(44 5)	D(40 1)	D(45 3)
	SB		C(27 9)	C(27 8)	C(28 2)	C(29 2)
	SWB		<u>F(100.0)</u>	<u>C(29.7)</u>	<u>F(100.0)</u>	<u>C(29.7)</u>
	Overall		F(81 7)	C(33 2)	F(80 6)	C(33 9)
7	Bryant Street/Georgia Avenue	Signal				
	NB		A(9 7)	B(11 2)	A(9 7)	B(11 2)
	SB		<u>A(2.4)</u>	<u>A(2.5)</u>	<u>A(2.4)</u>	<u>A(2.5)</u>
	Overall		A(4 7)	A(6 1)	A(4 7)	A(6 2)
8	Florida Avenue/Parcel C/W Street	Stop Sign				
	EBLR		D[33 4]	F[70 5]	E[35 3]	F[85 0]
	WBLR		N/A	N/A	N/A	N/A

Notes ¹ Analysis performed using Synchro/Simtraffic Version 6.0² An asterisk (*) indicates delays greater than 999.9 seconds

Table A-3 (cont)

Atlantic North (August 2006 Addendum)Peak Hour Intersection Levels of Service ¹

Intersection	Type of Control	2007 Background Conditions		2007 Total Future Conditions	
		AM	PM	AM	PM
9 W Street/Georgia Avenue	Signal				
WB		C(32.9)	C(31.9)	C(32.9)	C(31.9)
NB		A(8.8)	A(9.3)	A(8.8)	A(9.1)
SB		<u>B(15.2)</u>	<u>B(12.7)</u>	<u>B(15.2)</u>	<u>B(12.7)</u>
Overall		B(17.0)	B(14.9)	B(17.0)	B(14.8)
11 9th Street/V Street/Florida Avenue ⁽³⁾	Stop Sign				
EBLTR		C[19.96]	C[17.78]	C[24.50]	C[21.46]
WBLTR		B[12.78]	C[21.64]	B[14.10]	D[28.66]
NBLTR		B[13.18]	D[34.24]	B[14.09]	E[49.49]
SBLTR		B[10.20]	B[12.01]	B[11.39]	B[14.84]
12 8th Street/V Street	Stop Sign				
EBLTR		A[1.3]	A[0.5]	A[1.2]	A[0.5]
WBLTR		A[0.7]	A[0.6]	A[0.6]	A[0.6]
NBLTR		B[12.3]	C[15.5]	B[12.0]	C[15.3]
SBLTR		B[11.8]	B[14.0]	B[11.6]	B[13.7]
14 9th Street/U Street/Florida Avenue	Signal				
EB		C(23.1)	C(26.7)	C(23.1)	C(26.7)
WB		C(24.9)	C(22.7)	C(24.9)	C(22.7)
NB		C(29.3)	D(50.5)	C(29.4)	D(52.4)
SB		<u>B(19.8)</u>	<u>D(37.1)</u>	<u>B(13.3)</u>	<u>D(44.7)</u>
Overall		C(23.1)	C(34.6)	C(20.5)	D(37.0)
15 8th Street/Florida Avenue	Stop Sign				
EBLTR		A[1.0]	A[1.7]	A[1.0]	A[1.7]
WBLTR		A[0.2]	A[1.5]	A[0.2]	A[0.4]
NBLTR		F[155.0]	F[*]	F[83.4]	F[479.6]
SBLTR		F[309.8]	F[*]	F[220.5]	F[*]
16 9th Street/New Parcel C Driveway	Stop Sign				
EBLR		N/A	N/A	A[8.5]	A[8.5]
NBTL		N/A	N/A	A[7.3]	A[7.4]
17 Georgia Avenue/V Street	Signal				
EB		D(43.3)	E(57.0)	D(43.5)	E(64.5)
WB		D(36.2)	D(42.2)	D(39.0)	E(78.5)
NB		A(4.4)	A(5.8)	A(4.4)	A(5.9)
SB		<u>A(2.1)</u>	<u>A(2.1)</u>	<u>A(2.1)</u>	<u>A(2.3)</u>
Overall		A(7.4)	B(12.7)	A(7.7)	B(17.3)
18 Sherman Avenue/University Dorms	Stop Sign				
WBR		A[0.0]	B[12.5]	A[0.0]	B[12.5]

Notes ¹ Analysis performed using Synchro/Simtraffic Version 6.0² An asterisk (*) indicates delays greater than 999.9 seconds.Wells Associates, LLC
McLean, Virginia

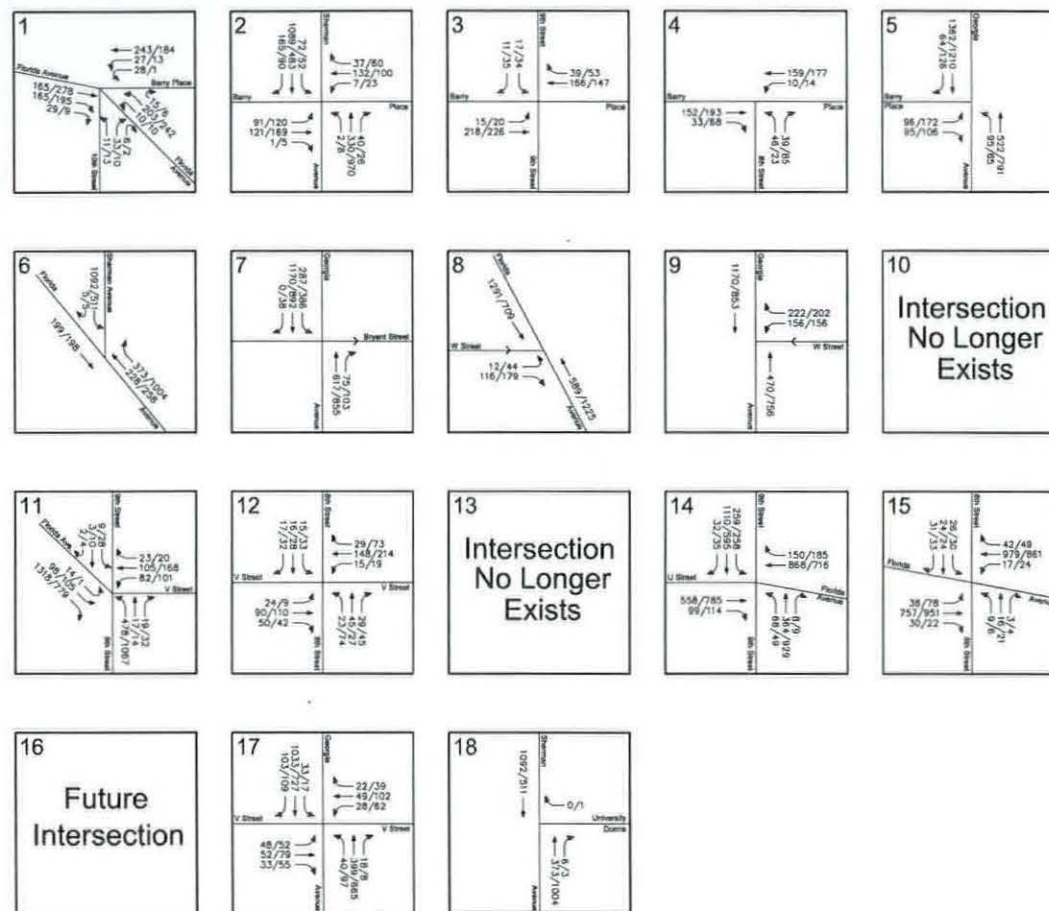
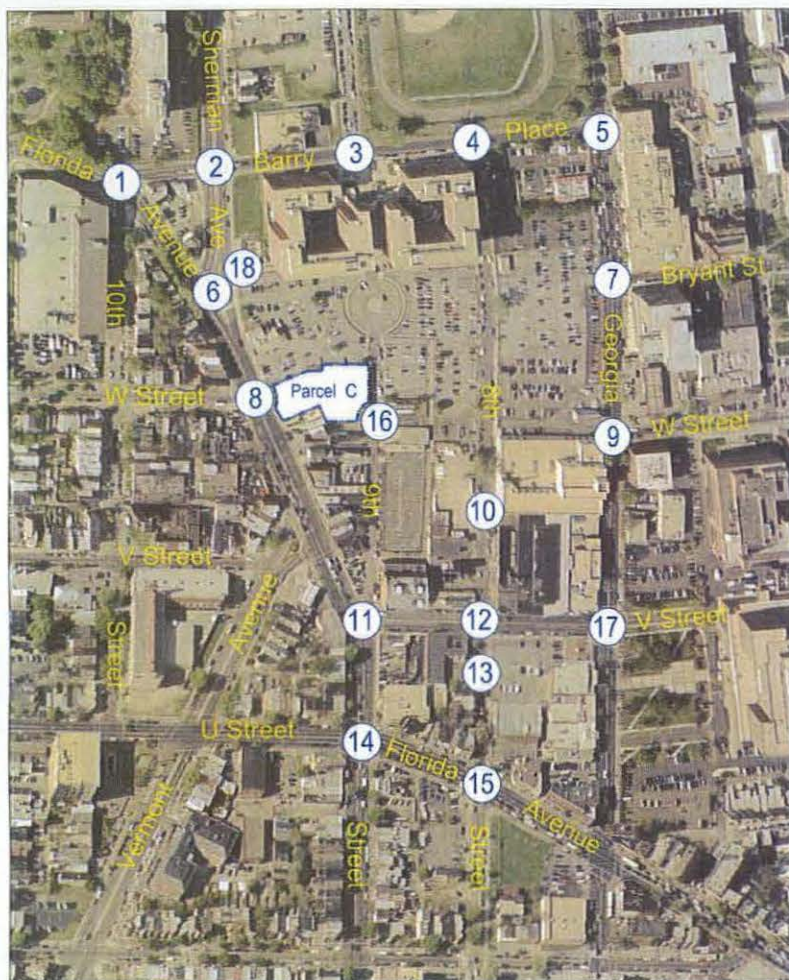


Figure A-1
Background Peak Hour Traffic Volumes
(Atlantic North - August 2006 Addendum)

AM PEAK HOUR
PM PEAK HOUR
000/000
North

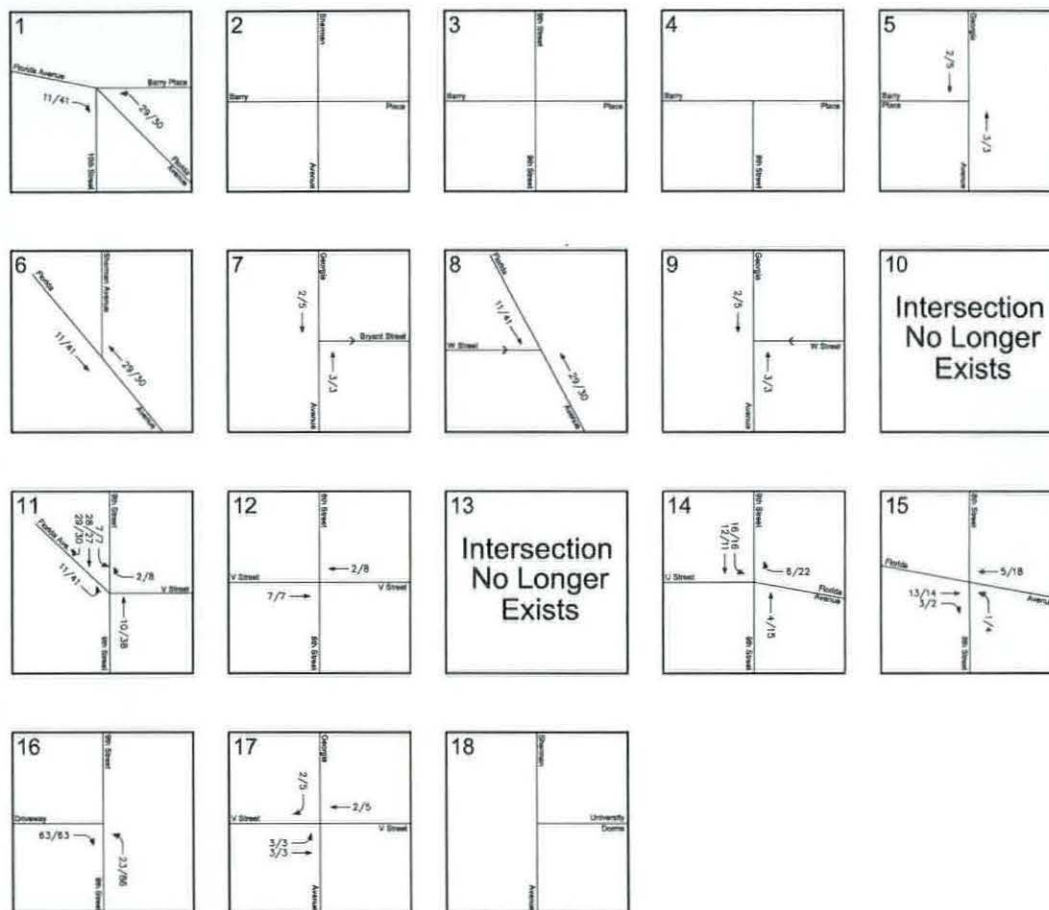
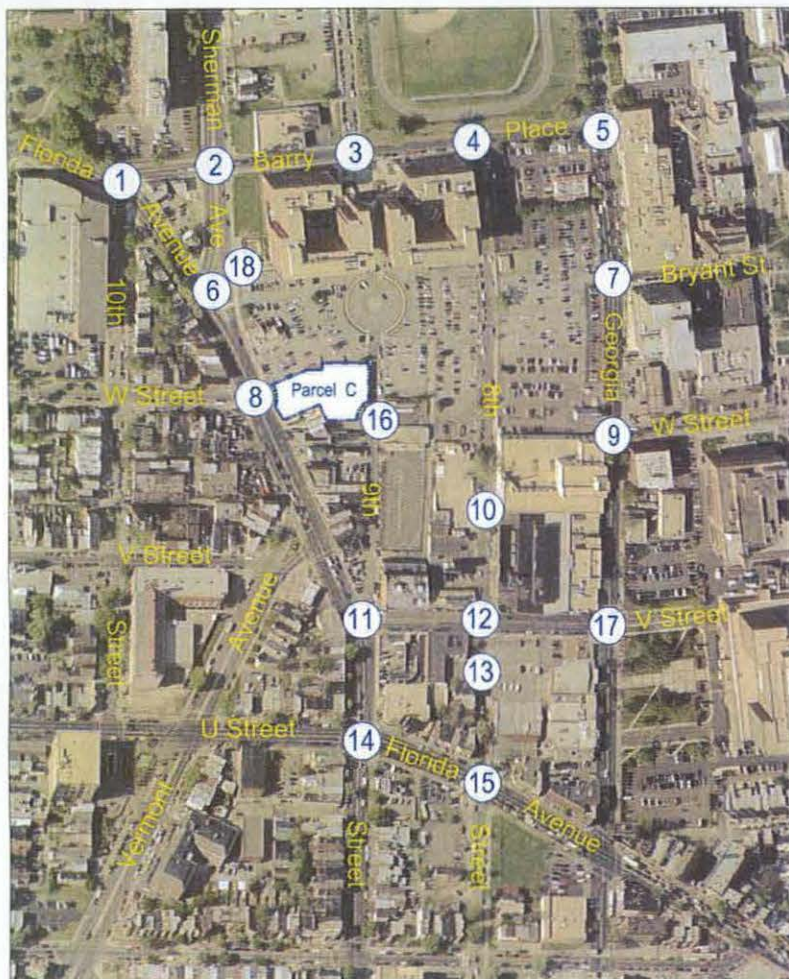


Figure A-2
Site-Generated Trips
(Atlantic North - August 2006 Addendum)

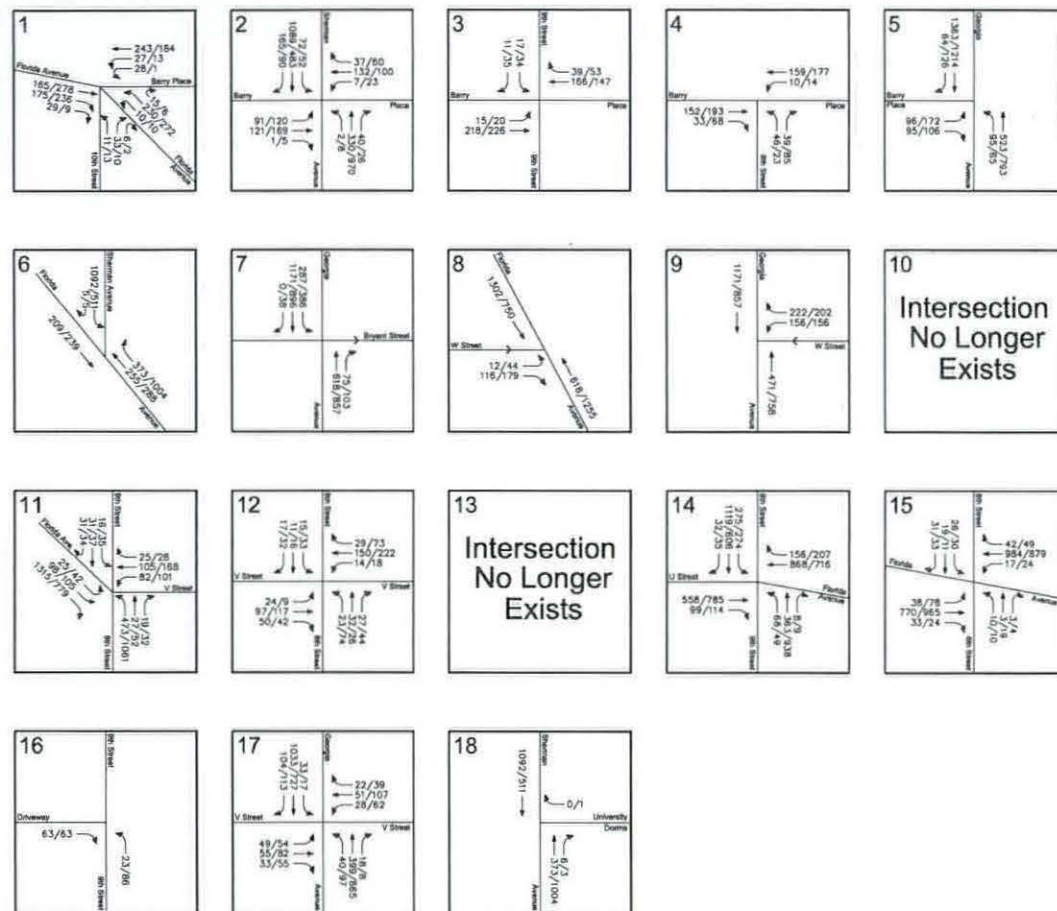
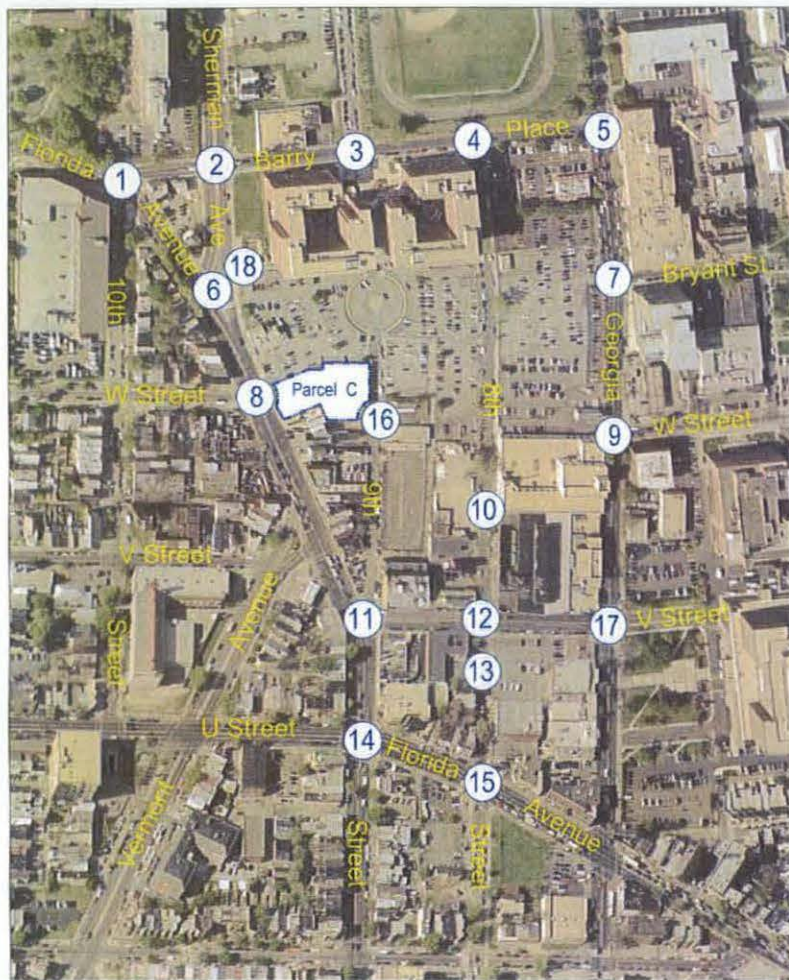


Figure A-3
Total Future Peak Hour Traffic Volumes
(Atlantic North - August 2006 Addendum)

AM PEAK HOUR
PM PEAK HOUR
000/000



HCM Unsignalized Intersection Capacity Analysis
1: 10th Avenue & Florida Avenue

Background AM (North)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	SER2
Lane Configurations												
Sign Control		Stop			Stop			Stop		Stop		
Volume (vph)	11	33	6	28	27	243	10	203	15	165	165	29
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)	12	36	7	30	29	264	11	221	16	179	179	32
Direction, Lane #	EB 1	WB 1	NB 1	SE 1	SE 2							
Volume Total (vph)	54	324	248	179	211							
Volume Left (vph)	12	30	11	179	0							
Volume Right (vph)	7	264	16	0	32							
Hadj (s)	0.01	-0.44	0.00	0.53	-0.07							
Departure Headway (s)	6.2	5.2	5.7	6.5	5.9							
Degree Utilization, x	0.09	0.47	0.39	0.32	0.34							
Capacity (veh/h)	495	641	587	529	584							
Control Delay (s)	9.9	12.8	12.3	11.3	10.7							
Approach Delay (s)	9.9	12.8	12.3	11.0								
Approach LOS	A	B	B	B								
Intersection Summary												
Delay			11.8									
HCM Level of Service			B									
Intersection Capacity Utilization			51.9%			ICU Level of Service			A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis 2: Barry Place & Sherman Street

Background AM (North)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	4.0
Lane Util. Factor		1.00			1.00			0.95			0.95	1.00
Frt		1.00			0.97			0.98			1.00	0.85
Flt Protected		0.98			1.00			1.00			1.00	1.00
Satd. Flow (prot)		1823			1806			3482			3528	1583
Flt Permitted		0.80			0.99			0.81			0.81	1.00
Satd. Flow (perm)		1498			1790			2815			2852	1583
Volume (vph)	91	121	1	7	132	37	2	330	40	72	1089	165
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	132	1	8	143	40	2	359	43	78	1184	179
RTOR Reduction (vph)	0	0	0	0	10	0	0	9	0	0	0	107
Lane Group Flow (vph)	0	232	0	0	181	0	0	395	0	0	1262	72
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)		65.0			65.0			25.0			25.0	25.0
Effective Green, g (s)		66.0			66.0			26.0			26.0	26.0
Actuated g/C Ratio		0.66			0.66			0.26			0.26	0.26
Clearance Time (s)		5.0			5.0			5.0			5.0	5.0
Lane Grp Cap (vph)		989			1181			732			742	412
v/s Ratio Prot												
v/s Ratio Perm		c0.15			0.10			0.14			c0.44	0.05
v/c Ratio		0.23			0.15			0.54			1.70	0.18
Uniform Delay, d1		6.8			6.4			31.8			37.0	28.7
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		0.6			0.3			2.8			321.1	0.9
Delay (s)		7.4			6.7			34.7			358.1	29.6
Level of Service		A			A			C			F	C
Approach Delay (s)		7.4			6.7			34.7			317.3	
Approach LOS		A			A			C			F	
Intersection Summary												
HCM Average Control Delay	209.1			HCM Level of Service			F					
HCM Volume to Capacity ratio	0.65											
Actuated Cycle Length (s)	100.0			Sum of lost time (s)			8.0					
Intersection Capacity Utilization	77.0%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
3: Barry Place & 9th Street

Background AM (North)

								
Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations								
Sign Control		Stop	Stop		Stop			
Volume (vph)	15	218	166	39	17	11		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	16	237	180	42	18	12		
Direction, Lane #	EB 1	WB 1	SB 1	SB 2				
Volume Total (vph)	253	223	18	12				
Volume Left (vph)	16	0	18	0				
Volume Right (vph)	0	42	0	12				
Hadj (s)	0.05	-0.08	0.53	-0.67				
Departure Headway (s)	4.3	4.2	6.1	4.9				
Degree Utilization, x	0.30	0.26	0.03	0.02				
Capacity (veh/h)	832	840	548	672				
Control Delay (s)	9.1	8.6	8.1	6.7				
Approach Delay (s)	9.1	8.6	7.5					
Approach LOS	A	A	A					
Intersection Summary								
Delay	8.8							
HCM Level of Service	A							
Intersection Capacity Utilization	33.8%			ICU Level of Service	A			
Analysis Period (min)	15							

HCM Unsignalized Intersection Capacity Analysis
4: Barry Place & 8th Street

Background AM (North)

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	152	33	10	159	46	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	165	36	11	173	50	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh						
Upstream signal (ft)				282		
pX, platoon unblocked						
vC, conflicting volume			201		378	183
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			201		378	183
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		92	95
cM capacity (veh/h)			1371		619	859
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	201	184	92			
Volume Left	0	11	50			
Volume Right	36	0	42			
cSH	1700	1371	710			
Volume to Capacity	0.12	0.01	0.13			
Queue Length 95th (ft)	0	1	11			
Control Delay (s)	0.0	0.5	10.8			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.5	10.8			
Approach LOS			B			
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization			28.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
5: Barry Place & Georgia Avenue

Background AM (North)

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			0.95	0.95	
Fr _t	0.93			1.00	0.99	
Fl _t Protected	0.98			0.99	1.00	
Satd. Flow (prot)	1695			3512	3515	
Fl _t Permitted	0.98			0.56	1.00	
Satd. Flow (perm)	1695			1977	3515	
Volume (vph)	96	95	95	522	1362	64
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	103	103	567	1480	70
RTOR Reduction (vph)	35	0	0	0	3	0
Lane Group Flow (vph)	172	0	0	670	1547	0
Turn Type		D.P+P				
Protected Phases	4		3	2 3	2	
Permitted Phases			2			
Actuated Green, G (s)	14.0			74.0	54.0	
Effective Green, g (s)	14.0			74.0	54.0	
Actuated g/C Ratio	0.14			0.74	0.54	
Clearance Time (s)	4.0				4.0	
Lane Grp Cap (vph)	237			1770	1898	
v/s Ratio Prot	c0.10			c0.08	c0.44	
v/s Ratio Perm				0.20		
v/c Ratio	0.72			0.38	0.81	
Uniform Delay, d ₁	41.2			4.7	18.9	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d ₂	17.5			0.6	4.0	
Delay (s)	58.7			5.3	22.9	
Level of Service	E			A	C	
Approach Delay (s)	58.7			5.3	22.9	
Approach LOS	E			A	C	
Intersection Summary						
HCM Average Control Delay			21.1		HCM Level of Service	C
HCM Volume to Capacity ratio			0.70			
Actuated Cycle Length (s)			100.0		Sum of lost time (s)	12.0
Intersection Capacity Utilization			78.0%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

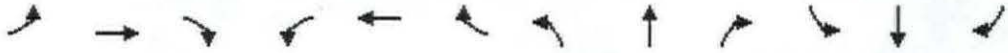
HCM Signalized Intersection Capacity Analysis
6: Florida Avenue & Sherman Street

Background AM (North)

	↑	↗	↘	↓	↙	↖
Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations	↑			↑	↗	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	1863			1863	1770	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	1863			1863	1770	1583
Volume (vph)	225	0	0	199	1092	5
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	0	0	216	1187	5
RTOR Reduction (vph)	0	0	0	0	0	2
Lane Group Flow (vph)	245	0	0	216	1187	3
Turn Type					Perm	
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	32.0			32.0	60.0	60.0
Effective Green, g (s)	32.0			32.0	60.0	60.0
Actuated g/C Ratio	0.32			0.32	0.60	0.60
Clearance Time (s)	4.0			4.0	4.0	4.0
Lane Grp Cap (vph)	596			596	1062	950
v/s Ratio Prot	c0.13			0.12	c0.67	
v/s Ratio Perm						0.00
v/c Ratio	0.41			0.36	1.12	0.00
Uniform Delay, d1	26.6			26.2	20.0	8.0
Progression Factor	1.43			1.00	2.30	2.64
Incremental Delay, d2	2.0			1.7	54.4	0.0
Delay (s)	39.9			27.9	100.3	21.1
Level of Service	D			C	F	C
Approach Delay (s)	39.9			27.9	100.0	
Approach LOS	D			C	F	
Intersection Summary						
HCM Average Control Delay		81.7		HCM Level of Service		F
HCM Volume to Capacity ratio		0.87				
Actuated Cycle Length (s)		100.0		Sum of lost time (s)		8.0
Intersection Capacity Utilization		79.0%		ICU Level of Service		D
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
7: Bryant Street & Georgia Avenue

Background AM (North)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								↑↑			↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)								4.0			4.0	
Lane Util. Factor								0.95			0.95	
Frt								0.98			1.00	
Flt Protected								1.00			0.99	
Satd. Flow (prot)								3481			3505	
Flt Permitted								1.00			0.63	
Satd. Flow (perm)								3481			2239	
Volume (vph)	0	0	0	0	0	0	0	616	75	287	1170	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0	0	670	82	312	1272	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	12	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	740	0	0	1584	0
Turn Type										Prot		
Protected Phases								2		1	1 2	
Permitted Phases												
Actuated Green, G (s)								46.0			72.0	
Effective Green, g (s)								46.0			72.0	
Actuated g/C Ratio								0.57			0.90	
Clearance Time (s)								4.0				
Lane Grp Cap (vph)								2002			2427	
v/s Ratio Prot								0.21			c0.21	
v/s Ratio Perm											c0.38	
v/c Ratio								0.37			0.65	
Uniform Delay, d1								9.2			1.0	
Progression Factor								1.00			1.00	
Incremental Delay, d2								0.5			1.4	
Delay (s)								9.7			2.4	
Level of Service								A			A	
Approach Delay (s)		0.0			0.0			9.7			2.4	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM Average Control Delay		4.7										
HCM Volume to Capacity ratio		0.65										
Actuated Cycle Length (s)		80.0										
Intersection Capacity Utilization		66.8%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
8: W Street & Florida Avenue

Background AM (North)

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	12	116	0	586	1291	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	126	0	637	1403	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)				858	318	
pX, platoon unblocked	0.87					
vC, conflicting volume	2040	702	1403			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2200	702	1403			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	61	67	100			
cM capacity (veh/h)	33	381	483			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2	
Volume Total	13	126	637	702	702	
Volume Left	13	0	0	0	0	
Volume Right	0	126	0	0	0	
cSH	33	381	1700	1700	1700	
Volume to Capacity	0.39	0.33	0.37	0.41	0.41	
Queue Length 95th (ft)	32	36	0	0	0	
Control Delay (s)	172.4	19.1	0.0	0.0	0.0	
Lane LOS	F	C				
Approach Delay (s)	33.4		0.0	0.0		
Approach LOS	D					
Intersection Summary						
Average Delay			2.1			
Intersection Capacity Utilization			49.5%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
9: W Street & Georgia Avenue

Background AM (North)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	←	←	↑↑	↑	←	↑↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0			4.0
Lane Util. Factor	1.00		0.95			0.95
Frt	0.92		1.00			1.00
Flt Protected	0.98		1.00			1.00
Satd. Flow (prot)	1681		3539			3539
Flt Permitted	0.98		1.00			1.00
Satd. Flow (perm)	1681		3539			3539
Volume (vph)	156	222	469	0	0	1170
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	241	510	0	0	1272
RTOR Reduction (vph)	51	0	0	0	0	0
Lane Group Flow (vph)	360	0	510	0	0	1272
Turn Type						
Protected Phases	3		2			2
Permitted Phases						
Actuated Green, G (s)	34.0		58.0			58.0
Effective Green, g (s)	34.0		58.0			58.0
Actuated g/C Ratio	0.34		0.58			0.58
Clearance Time (s)	4.0		4.0			4.0
Lane Grp Cap (vph)	572		2053			2053
v/s Ratio Prot	c0.21		0.14			c0.36
v/s Ratio Perm						
v/c Ratio	0.63		0.25			0.62
Uniform Delay, d1	27.7		10.3			13.8
Progression Factor	1.00		0.83			1.00
Incremental Delay, d2	5.2		0.3			1.4
Delay (s)	32.9		8.8			15.2
Level of Service	C		A			B
Approach Delay (s)	32.9		8.8			15.2
Approach LOS	C		A			B
Intersection Summary						
HCM Average Control Delay			17.0		HCM Level of Service	B
HCM Volume to Capacity ratio			0.62			
Actuated Cycle Length (s)			100.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			61.3%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

ALL-WAY STOP CONTROL ANALYSIS									
General Information					Site Information				
Analyst		JWW			Intersection		Florida/9th/V Streets		
Agency/Co		Wells & Associates LLC			Jurisdiction		Washington DC		
Date Performed		8/29/2006			Analysis Year		2007 BG Conditions		
Analysis Time Period		AM Peak Period							
Project ID 2799 Atlantic North (August 2006 Addendum)									
East/West Street 9th Street/V Street					North/South Street Florida/9th Street				
Volume Adjustments and Site Characteristics									
Approach		Eastbound			Westbound				
Movement		L	T	R	L	T	R		
Volume		14	98	439	82	105	23		
%Thrus Left Lane		55			50				
Approach		Northbound			Southbound				
Movement		L	T	R	L	T	R		
Volume		159	17	19	9	3	2		
%Thrus Left Lane		45			50				
		Eastbound		Westbound		Northbound		Southbound	
		L1	L2	L1	L2	L1	L2	L1	L2
Configuration		LT	TR	LTR		LT	TR	LTR	
PHF		0.90	0.90	0.90		0.90	0.90	0.90	
Flow Rate		73	537	232		183	32	15	
% Heavy Vehicles		2	2	2		2	2	2	
No Lanes		2		1		2		1	
Geometry Group		5		4b		5		4b	
Duration, T		0.25							
Saturation Headway Adjustment Worksheet									
Prop Left-Turns	0.2	0.0	0.4		1.0	0.0	0.7		
Prop Right-Turns	0.0	0.9	0.1		0.0	0.7	0.1		
Prop Heavy Vehicle									
hLT-adj	0.5	0.5	0.2	0.2	0.5	0.5	0.2	0.2	
hRT-adj	-0.7	-0.7	-0.6	-0.6	-0.7	-0.7	-0.6	-0.6	
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	
hadj, computed	5.79	5.79	5.79		5.79	5.79	5.79		
Departure Headway and Service Time									
hd initial value	3.20	3.20	3.20		3.20	3.20	3.20		
x initial	0.06	0.48	0.21		0.16	0.03	0.01		
hd final value	5.79	5.79	5.79		5.79	5.79	5.79		
x, final value	0.12	0.75	0.40		0.36	0.06	0.03		
Move-up time, m	2.3		2.3		2.3		2.3		
Service Time	3.5	2.7	3.5	2.7	3.5	2.7	3.5	2.7	
Capacity and Level of Service									
		Eastbound		Westbound		Northbound		Southbound	
		L1	L2	L1	L2	L1	L2	L1	L2
Capacity		323	704	482		433	282	265	
Delay		9.26	21.42	12.78		13.87	9.26	10.20	
LOS		A	C	B		B	A	B	
Approach Delay		19.96		12.78		13.18		10.20	
LOS		C		B		B		B	
Intersection Delay		16.91							
Intersection LOS		C							

HCM Unsignalized Intersection Capacity Analysis 12: V Street & 8th Street

Background AM (North)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	88	42	15	148	29	23	45	29	15	16	17
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)	26	96	46	16	161	32	25	49	32	16	17	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)					311							
pX, platoon unblocked												
vC, conflicting volume	192			141			407	396	118	436	403	177
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	192			141			407	396	118	436	403	177
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 %	98			99			95	91	97	96	97	98
cM capacity (veh/h)	1381			1442			517	525	933	465	520	866
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	167	209	105	52								
Volume Left	26	16	25	16								
Volume Right	46	32	32	18								
cSH	1381	1442	601	581								
Volume to Capacity	0.02	0.01	0.18	0.09								
Queue Length 95th (ft)	1	1	16	7								
Control Delay (s)	1.3	0.7	12.3	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	1.3	0.7	12.3	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			27.4%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
14: U Street & Florida Avenue

Background AM (North)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95	1.00		0.95		1.00	0.95	
Fr't		0.98			1.00	0.85		1.00		1.00	1.00	
Flt Protected		1.00			1.00	1.00		0.99		0.95	1.00	
Satd. Flow (prot)		3459			3539	1583		3502		1770	3524	
Flt Permitted		1.00			1.00	1.00		0.63		0.35	1.00	
Satd. Flow (perm)		3459			3539	1583		2224		659	3524	
Volume (vph)	0	558	99	0	868	150	68	364	8	259	1110	32
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	607	108	0	943	163	74	396	9	282	1207	35
RTOR Reduction (vph)	0	15	0	0	0	96	0	1	0	0	2	0
Lane Group Flow (vph)	0	700	0	0	943	67	0	478	0	282	1240	0
Turn Type						Perm	Perm			pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases						8	2			6		
Actuated Green, G (s)		41.0			41.0	41.0		36.0		51.0	51.0	
Effective Green, g (s)		41.0			41.0	41.0		36.0		51.0	51.0	
Actuated g/C Ratio		0.41			0.41	0.41		0.36		0.51	0.51	
Clearance Time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lane Grp Cap (vph)		1418			1451	649		801		458	1797	
v/s Ratio Prot		0.20			c0.27					0.07	c0.35	
v/s Ratio Perm						0.04		0.21		0.25		
v/c Ratio		0.49			0.65	0.10		0.60		0.62	0.69	
Uniform Delay, d1		21.8			23.7	18.2		26.1		15.1	18.5	
Progression Factor		1.00			1.00	1.00		1.00		0.94	0.94	
Incremental Delay, d2		1.2			2.3	0.3		3.3		6.1	2.2	
Delay (s)		23.1			26.0	18.5		29.3		20.2	19.7	
Level of Service		C			C	B		C		C	B	
Approach Delay (s)		23.1			24.9			29.3			19.8	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM Average Control Delay		23.1					HCM Level of Service		C			
HCM Volume to Capacity ratio		0.67										
Actuated Cycle Length (s)		100.0					Sum of lost time (s)		8.0			
Intersection Capacity Utilization		78.0%					ICU Level of Service		D			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
15: Florida Avenue & 8th Street

Background AM (North)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	38	757	30	17	979	42	9	16	3	23	23	27
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)	41	823	33	18	1064	46	10	17	3	25	25	29
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)		301										
pX, platoon unblocked				0.86			0.86	0.86	0.86	0.86	0.86	
vC, conflicting volume	1110			855			1355	2068	428	1630	2062	378
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1110			676			1254	2079	181	1572	2072	378
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
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 %	93			98			81	58	100	38	41	95
cM capacity (veh/h)	625			788			52	42	718	40	42	620
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1					
Volume Total	453	444	285	532	312	30	79					
Volume Left	41	0	18	0	0	10	25					
Volume Right	0	33	0	0	46	3	29					
cSH	625	1700	788	1700	1700	50	63					
Volume to Capacity	0.07	0.26	0.02	0.31	0.18	0.61	1.26					
Queue Length 95th (ft)	5	0	2	0	0	59	164					
Control Delay (s)	1.9	0.0	0.9	0.0	0.0	155.0	309.8					
Lane LOS	A		A			F	F					
Approach Delay (s)	1.0		0.2			155.0	309.8					
Approach LOS						F	F					
Intersection Summary												
Average Delay			14.2									
Intersection Capacity Utilization			58.6%			ICU Level of Service			B			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
17: V Street & Georgia Avenue

Background AM (North)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frt		0.97		1.00	0.95			0.99			0.99	
Flt Protected		0.98		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		1769		1770	1776			3503			3487	
Flt Permitted		0.87		0.57	1.00			0.78			0.93	
Satd. Flow (perm)		1561		1062	1776			2735			3239	
Volume (vph)	48	52	33	28	49	22	40	399	18	33	1033	103
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	57	36	30	53	24	43	434	20	36	1123	112
RTOR Reduction (vph)	0	11	0	0	16	0	0	3	0	0	7	0
Lane Group Flow (vph)	0	134	0	30	61	0	0	494	0	0	1264	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		18.0		18.0	18.0			74.0			74.0	
Effective Green, g (s)		18.0		18.0	18.0			74.0			74.0	
Actuated g/C Ratio		0.18		0.18	0.18			0.74			0.74	
Clearance Time (s)		4.0		4.0	4.0			4.0			4.0	
Lane Grp Cap (vph)		281		191	320			2024			2397	
v/s Ratio Prot					0.03							
v/s Ratio Perm		c0.09		0.03				0.18			c0.39	
v/c Ratio		0.48		0.16	0.19			0.24			0.53	
Uniform Delay, d1		36.8		34.6	34.8			4.1			5.5	
Progression Factor		1.02		1.00	1.00			1.00			0.26	
Incremental Delay, d2		5.7		1.7	1.3			0.3			0.7	
Delay (s)		43.3		36.3	36.1			4.4			2.1	
Level of Service		D		D	D			A			A	
Approach Delay (s)		43.3			36.2			4.4			2.1	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM Average Control Delay		7.4						HCM Level of Service		A		
HCM Volume to Capacity ratio		0.52										
Actuated Cycle Length (s)		100.0						Sum of lost time (s)		8.0		
Intersection Capacity Utilization		69.6%						ICU Level of Service		C		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 18: University Dorns & Sherman Street

Background AM (North)

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	373	6	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	405	7	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)					299	
pX, platoon unblocked						
vC, conflicting volume	409	206			412	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	409	206			412	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	571	800			1143	
Direction, Lane #	WB 1	NB 1	NB 2			
Volume Total	0	270	142			
Volume Left	0	0	0			
Volume Right	0	0	7			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.16	0.08			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0				
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			13.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
1: 10th Avenue & Florida Avenue

Background PM (North)

																			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	SER2							
Lane Configurations																			
Sign Control		Stop			Stop			Stop		Stop									
Volume (vph)	13	10	2	1	13	184	10	242	6	278	195	9							
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)	14	11	2	1	14	200	11	263	7	302	212	10							
Direction, Lane #	EB 1	WB 1	NB 1	SE 1	SE 2														
Volume Total (vph)	27	215	280	302	222														
Volume Left (vph)	14	1	11	302	0														
Volume Right (vph)	2	200	7	0	10														
Hadj (s)	0.09	-0.52	0.03	0.53	0.00														
Departure Headway (s)	6.4	5.3	5.4	6.1	5.5														
Degree Utilization, x	0.05	0.32	0.42	0.51	0.34														
Capacity (veh/h)	483	617	639	576	631														
Control Delay (s)	9.7	10.8	12.3	14.0	10.2														
Approach Delay (s)	9.7	10.8	12.3	12.4															
Approach LOS	A	B	B	B															
Intersection Summary																			
Delay			12.0																
HCM Level of Service			B																
Intersection Capacity Utilization			51.8%	ICU Level of Service		A													
Analysis Period (min)			15																

HCM Signalized Intersection Capacity Analysis 2: Barry Place & Sherman Street

Background PM (North)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	4.0
Lane Util. Factor		1.00			1.00			0.95			0.95	1.00
Flt		1.00			0.96			1.00			1.00	0.85
Flt Protected		0.98			0.99			1.00			1.00	1.00
Satd. Flow (prot)		1822			1769			3524			3522	1583
Flt Permitted		0.80			0.94			0.95			0.52	1.00
Satd. Flow (perm)		1482			1677			3345			1837	1583
Volume (vph)	120	169	5	23	100	60	8	970	26	52	483	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	184	5	25	109	65	9	1054	28	57	525	98
RTOR Reduction (vph)	0	1	0	0	1	0	0	1	0	0	0	73
Lane Group Flow (vph)	0	318	0	0	198	0	0	1090	0	0	582	25
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)		65.0			65.0			25.0			25.0	25.0
Effective Green, g (s)		66.0			66.0			26.0			26.0	26.0
Actuated g/C Ratio		0.66			0.66			0.26			0.26	0.26
Clearance Time (s)		5.0			5.0			5.0			5.0	5.0
Lane Grp Cap (vph)		978			1107			870			478	412
v/s Ratio Prot												
v/s Ratio Perm		c0.21			0.12			c0.33			0.32	0.02
v/c Ratio		0.33			0.18			1.25			1.22	0.06
Uniform Delay, d1		7.4			6.6			37.0			37.0	27.8
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		0.9			0.4			123.0			115.7	0.3
Delay (s)		8.2			6.9			160.0			152.7	28.1
Level of Service		A			A			F			F	C
Approach Delay (s)		8.2			6.9			160.0			134.8	
Approach LOS		A			A			F			F	
Intersection Summary												
HCM Average Control Delay		118.1										
HCM Volume to Capacity ratio		0.59										
Actuated Cycle Length (s)		100.0							8.0			
Intersection Capacity Utilization		82.1%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
3: Barry Place & 9th Street

Background PM (North)

								
Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations								
Sign Control		Stop	Stop		Stop			
Volume (vph)	20	226	147	53	34	35		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	22	246	160	58	37	38		
Direction, Lane #	EB 1	WB 1	SB 1	SB 2				
Volume Total (vph)	267	217	37	38				
Volume Left (vph)	22	0	37	0				
Volume Right (vph)	0	58	0	38				
Hadj (s)	0.05	-0.12	0.53	-0.67				
Departure Headway (s)	4.4	4.3	6.1	4.9				
Degree Utilization, x	0.33	0.26	0.06	0.05				
Capacity (veh/h)	802	812	546	669				
Control Delay (s)	9.5	8.7	8.3	7.0				
Approach Delay (s)	9.5	8.7	7.6					
Approach LOS	A	A	A					
Intersection Summary								
Delay			9.0					
HCM Level of Service			A					
Intersection Capacity Utilization			37.3%	ICU Level of Service	A			
Analysis Period (min)			15					

HCM Unsignalized Intersection Capacity Analysis 4: Barry Place & 8th Street

Background PM (North)

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	193	68	14	177	23	85
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	210	74	15	192	25	92
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh						
Upstream signal (ft)				282		
pX, platoon unblocked						
vC, conflicting volume			284		470	247
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			284		470	247
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		95	88
cM capacity (veh/h)			1279		546	792
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	284	208	117			
Volume Left	0	15	25			
Volume Right	74	0	92			
cSH	1700	1279	723			
Volume to Capacity	0.17	0.01	0.16			
Queue Length 95th (ft)	0	1	14			
Control Delay (s)	0.0	0.7	10.9			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.7	10.9			
Approach LOS			B			
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization			34.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
5: Barry Place & Georgia Avenue

Background PM (North)

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			0.95	0.95	
Flt	0.95			1.00	0.99	
Flt Protected	0.97			1.00	1.00	
Satd. Flow (prot)	1714			3526	3489	
Flt Permitted	0.97			0.68	1.00	
Satd. Flow (perm)	1714			2389	3489	
Volume (vph)	172	106	65	791	1210	126
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	115	71	860	1315	137
RTOR Reduction (vph)	22	0	0	0	8	0
Lane Group Flow (vph)	280	0	0	931	1444	0
Turn Type		D.P+P				
Protected Phases	4		3	2 3	2	
Permitted Phases			2			
Actuated Green, G (s)	14.0			74.0	54.0	
Effective Green, g (s)	14.0			74.0	54.0	
Actuated g/C Ratio	0.14			0.74	0.54	
Clearance Time (s)	4.0				4.0	
Lane Grp Cap (vph)	240			1995	1884	
v/s Ratio Prot	c0.16			c0.09	c0.41	
v/s Ratio Perm				0.25		
v/c Ratio	1.17			0.47	0.77	
Uniform Delay, d1	43.0			5.2	18.1	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	110.1			0.8	3.0	
Delay (s)	153.1			5.9	21.1	
Level of Service	F			A	C	
Approach Delay (s)	153.1			5.9	21.1	
Approach LOS	F			A	C	
Intersection Summary						
HCM Average Control Delay		30.7		HCM Level of Service		C
HCM Volume to Capacity ratio		0.76				
Actuated Cycle Length (s)		100.0		Sum of lost time (s)	12.0	
Intersection Capacity Utilization		87.2%		ICU Level of Service		E
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
6: Florida Avenue & Sherman Street

Background PM (North)

	↑	↗	↘	↓	↙	↖
Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations	↑			↑	↗	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	1863			1863	1770	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	1863			1863	1770	1583
Volume (vph)	258	0	0	198	511	5
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	280	0	0	215	555	5
RTOR Reduction (vph)	0	0	0	0	0	2
Lane Group Flow (vph)	280	0	0	215	555	3
Turn Type					Perm	
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	32.0			32.0	60.0	60.0
Effective Green, g (s)	32.0			32.0	60.0	60.0
Actuated g/C Ratio	0.32			0.32	0.60	0.60
Clearance Time (s)	4.0			4.0	4.0	4.0
Lane Grp Cap (vph)	596			596	1062	950
v/s Ratio Prot	c0.15			0.12	c0.31	
v/s Ratio Perm						0.00
v/c Ratio	0.47			0.36	0.52	0.00
Uniform Delay, d1	27.2			26.1	11.7	8.0
Progression Factor	1.57			1.00	2.54	2.70
Incremental Delay, d2	1.9			1.7	0.2	0.0
Delay (s)	44.5			27.8	29.7	21.6
Level of Service	D			C	C	C
Approach Delay (s)	44.5			27.8	29.7	
Approach LOS	D			C	C	
Intersection Summary						
HCM Average Control Delay		33.2		HCM Level of Service		C
HCM Volume to Capacity ratio		0.50				
Actuated Cycle Length (s)		100.0		Sum of lost time (s)	8.0	
Intersection Capacity Utilization		48.6%		ICU Level of Service	A	
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
7: Bryant Street & Georgia Avenue

Background PM (North)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								↑↑			↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)								4.0			4.0	
Lane Util. Factor								0.95			0.95	
Frt								0.98			1.00	
Flt Protected								1.00			0.99	
Satd. Flow (prot)								3482			3473	
Flt Permitted								1.00			0.53	
Satd. Flow (perm)								3482			1864	
Volume (vph)	0	0	0	0	0	0	0	855	103	386	892	38
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0	0	929	112	420	970	41
RTOR Reduction (vph)	0	0	0	0	0	0	0	11	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	1030	0	0	1431	0
Turn Type										Prot		
Protected Phases								2		1	1 2	
Permitted Phases												
Actuated Green, G (s)								46.0			72.0	
Effective Green, g (s)								46.0			72.0	
Actuated g/C Ratio								0.57			0.90	
Clearance Time (s)								4.0				
Lane Grp Cap (vph)								2002			2201	
v/s Ratio Prot								0.30			c0.21	
v/s Ratio Perm											c0.37	
v/c Ratio								0.51			0.65	
Uniform Delay, d1								10.3			1.0	
Progression Factor								1.00			1.00	
Incremental Delay, d2								0.9			1.5	
Delay (s)								11.2			2.5	
Level of Service								B			A	
Approach Delay (s)		0.0			0.0			11.2			2.5	
Approach LOS		A			A			B			A	
Intersection Summary												
HCM Average Control Delay		6.1									A	
HCM Volume to Capacity ratio		0.65										
Actuated Cycle Length (s)		80.0										
Intersection Capacity Utilization		70.7%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
8: W Street & Florida Avenue

Background PM (North)

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	44	179	0	1225	709	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	195	0	1332	771	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)				318		
pX, platoon unblocked						
vC, conflicting volume	2102	385	771			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2102	385	771			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	68	100			
cM capacity (veh/h)	44	613	840			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2	
Volume Total	48	195	1332	385	385	
Volume Left	48	0	0	0	0	
Volume Right	0	195	0	0	0	
cSH	44	613	1700	1700	1700	
Volume to Capacity	1.08	0.32	0.78	0.23	0.23	
Queue Length 95th (ft)	111	34	0	0	0	
Control Delay (s)	302.3	13.6	0.0	0.0	0.0	
Lane LOS	F	B				
Approach Delay (s)	70.5		0.0	0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			7.3			
Intersection Capacity Utilization			74.5%	ICU Level of Service	D	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
9: W Street & Georgia Avenue

Background PM (North)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	←	→	←	→	←	→
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0			4.0
Lane Util. Factor	1.00		0.95			0.95
Fr _t	0.92		1.00			1.00
Flt Protected	0.98		1.00			1.00
Satd. Flow (prot)	1684		3539			3539
Flt Permitted	0.98		1.00			1.00
Satd. Flow (perm)	1684		3539			3539
Volume (vph)	156	202	756	0	0	853
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	220	822	0	0	927
RTOR Reduction (vph)	47	0	0	0	0	0
Lane Group Flow (vph)	343	0	822	0	0	927
Turn Type						
Protected Phases	3		2			2
Permitted Phases						
Actuated Green, G (s)	34.0		58.0			58.0
Effective Green, g (s)	34.0		58.0			58.0
Actuated g/C Ratio	0.34		0.58			0.58
Clearance Time (s)	4.0		4.0			4.0
Lane Grp Cap (vph)	573		2053			2053
v/s Ratio Prot	c0.20		0.23			c0.26
v/s Ratio Perm						
v/c Ratio	0.60		0.40			0.45
Uniform Delay, d ₁	27.3		11.5			11.9
Progression Factor	1.00		0.76			1.00
Incremental Delay, d ₂	4.6		0.5			0.7
Delay (s)	31.9		9.3			12.7
Level of Service	C		A			B
Approach Delay (s)	31.9		9.3			12.7
Approach LOS	C		A			B
Intersection Summary						
HCM Average Control Delay			14.9		HCM Level of Service	B
HCM Volume to Capacity ratio			0.51			
Actuated Cycle Length (s)			100.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			51.3%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

ALL-WAY STOP CONTROL ANALYSIS									
General Information					Site Information				
Analyst	JWW				Intersection	Flonda/9th/V Streets			
Agency/Co	Wells & Associates LLC				Junsdiction	Washington DC			
Date Performed	8/29/2006				Analysis Year	2007 BG Conditions			
Analysis Time Period	PM Peak Period								
Project ID 2799 Atlantic North (August 2006 Addendum)									
East/West Street 9th Street/V Street					North/South Street Flonda/9th Street				
Volume Adjustments and Site Characteristics									
Approach	Eastbound				Westbound				
Movement	L	T	R		L	T	R		
Volume	1	105	260		101	168	20		
%Thrus Left Lane	55				50				
Approach	Northbound				Southbound				
Movement	L	T	R		L	T	R		
Volume	356	14	32		28	10	4		
%Thrus Left Lane	45				50				
	Eastbound		Westbound		Northbound		Southbound		
	L1	L2	L1	L2	L1	L2	L1	L2	
Configuration	LT	TR	LTR		LT	TR	LTR		
PHF	0.90	0.90	0.90		0.90	0.90	0.90		
Flow Rate	64	341	320		401	43	46		
% Heavy Vehicles	2	2	2		2	2	2		
No Lanes	2		1		2		1		
Geometry Group	5		4b		5		4b		
Duration T	0.25								
Saturation Headway Adjustment Worksheet									
Prop Left-Turns	0.0	0.0	0.3		1.0	0.0	0.7		
Prop Right-Turns	0.0	0.8	0.1		0.0	0.8	0.1		
Prop Heavy Vehicle									
hLT-adj	0.5	0.5	0.2	0.2	0.5	0.5	0.2	0.2	
hRT-adj	-0.7	-0.7	-0.6	-0.6	-0.7	-0.7	-0.6	-0.6	
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	
hadj computed	7.12	7.12	7.12		7.12	7.12	7.12		
Departure Headway and Service Time									
hd initial value	3.20	3.20	3.20		3.20	3.20	3.20		
x initial	0.06	0.30	0.28		0.36	0.04	0.04		
hd final value	7.12	7.12	7.12		7.12	7.12	7.12		
x, final value	0.13	0.62	0.64		0.83	0.08	0.11		
Move-up time m	2.3		2.3		2.3		2.3		
Service Time	4.8	4.2	4.8	4.2	4.8	4.2	4.8	4.2	
Capacity and Level of Service									
	Eastbound		Westbound		Northbound		Southbound		
	L1	L2	L1	L2	L1	L2	L1	L2	
Capacity	314	532	484		476	293	296		
Delay	10.84	19.08	21.64		36.88	9.58	12.01		
LOS	B	C	C		E	A	B		
Approach Delay	17.78		21.64		34.24		12.01		
LOS	C		C		D		B		
Intersection Delay	24.59								
Intersection LOS	C								

HCM Unsignalized Intersection Capacity Analysis 12: V Street & 8th Street

Background PM (North)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	9	110	42	19	214	73	74	27	45	33	28	32
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)	10	120	46	21	233	79	80	29	49	36	30	35
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)					305							
pX, platoon unblocked	0.96						0.96	0.96		0.96	0.96	0.96
vC, conflicting volume	312			165			526	515	142	539	498	272
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	284			165			506	495	142	520	478	243
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 %	99			99			80	93	95	91	93	95
cM capacity (veh/h)	1228			1413			408	447	905	396	457	765
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	175	333	159	101								
Volume Left	10	21	80	36								
Volume Right	46	79	49	35								
cSH	1228	1413	501	499								
Volume to Capacity	0.01	0.01	0.32	0.20								
Queue Length 95th (ft)	1	1	34	19								
Control Delay (s)	0.5	0.6	15.5	14.0								
Lane LOS	A	A	C	B								
Approach Delay (s)	0.5	0.6	15.5	14.0								
Approach LOS			C	B								
Intersection Summary												
Average Delay			5.4									
Intersection Capacity Utilization			41.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
14: U Street & Florida Avenue

Background PM (North)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑		↑↑		↑	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95	1.00		0.95		1.00	0.95	
Frt		0.98			1.00	0.85		1.00		1.00	0.99	
Flt Protected		1.00			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		3472			3539	1583		3526		1770	3510	
Flt Permitted		1.00			1.00	1.00		0.88		0.10	1.00	
Satd. Flow (perm)		3472			3539	1583		3098		186	3510	
Volume (vph)	0	785	114	0	716	185	49	929	9	258	595	35
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	853	124	0	778	201	53	1010	10	280	647	38
RTOR Reduction (vph)	0	11	0	0	0	119	0	1	0	0	4	0
Lane Group Flow (vph)	0	966	0	0	778	82	0	1072	0	280	681	0
Turn Type						Perm	Perm			pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases						8	2			6		
Actuated Green, G (s)		41.0			41.0	41.0		36.0		51.0	51.0	
Effective Green, g (s)		41.0			41.0	41.0		36.0		51.0	51.0	
Actuated g/C Ratio		0.41			0.41	0.41		0.36		0.51	0.51	
Clearance Time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lane Grp Cap (vph)		1424			1451	649		1115		269	1790	
v/s Ratio Prot		c0.28			0.22					c0.11	0.19	
v/s Ratio Perm						0.05		0.35		c0.42		
v/c Ratio		0.68			0.54	0.13		0.96		1.04	0.38	
Uniform Delay, d1		24.1			22.3	18.4		31.3		27.9	14.9	
Progression Factor		1.00			1.00	1.00		1.00		0.88	0.99	
Incremental Delay, d2		2.6			1.4	0.4		19.2		65.9	0.6	
Delay (s)		26.7			23.7	18.8		50.5		90.5	15.3	
Level of Service		C			C	B		D		F	B	
Approach Delay (s)		26.7			22.7			50.5			37.1	
Approach LOS		C			C			D			D	
Intersection Summary												
HCM Average Control Delay		34.6					HCM Level of Service		C			
HCM Volume to Capacity ratio		0.86										
Actuated Cycle Length (s)		100.0					Sum of lost time (s)		8.0			
Intersection Capacity Utilization		80.3%					ICU Level of Service		D			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
15: Florida Avenue & 8th Street

Background PM (North)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	78	951	22	24	861	49	6	21	4	30	24	33
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)	85	1034	24	26	936	53	7	23	4	33	26	36
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)		301										
pX, platoon unblocked				0.78			0.78	0.78	0.78	0.78	0.78	
vC, conflicting volume	989			1058			1628	2257	529	1717	2242	339
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	989			793			1524	2328	116	1637	2310	339
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
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 %	88			96			0	5	99	0	0	95
cM capacity (veh/h)	695			643			0	24	714	7	25	657
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1					
Volume Total	602	541	260	468	287	34	95					
Volume Left	85	0	26	0	0	7	33					
Volume Right	0	24	0	0	53	4	36					
cSH	695	1700	643	1700	1700	0	17					
Volume to Capacity	0.12	0.32	0.04	0.28	0.17	Err	5.64					
Queue Length 95th (ft)	10	0	3	0	0	Err	Err					
Control Delay (s)	3.2	0.0	1.5	0.0	0.0	Err	Err					
Lane LOS	A		A			F	F					
Approach Delay (s)	1.7		0.4			Err	Err					
Approach LOS						F	F					
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			66.0%		ICU Level of Service		C					
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis 17: V Street & Georgia Avenue

Background PM (North)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00			0.95			0.95	
Frt		0.96		1.00	0.96			1.00			0.98	
Flt Protected		0.99		0.95	1.00			0.99			1.00	
Satd. Flow (prot)		1764		1770	1786			3511			3468	
Flt Permitted		0.78		0.45	1.00			0.71			0.93	
Satd. Flow (perm)		1388		840	1786			2517			3236	
Volume (vph)	52	79	55	62	102	39	97	665	8	17	727	109
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	57	86	60	67	111	42	105	723	9	18	790	118
RTOR Reduction (vph)	0	15	0	0	14	0	0	1	0	0	11	0
Lane Group Flow (vph)	0	188	0	67	139	0	0	836	0	0	915	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		18.0		18.0	18.0			74.0			74.0	
Effective Green, g (s)		18.0		18.0	18.0			74.0			74.0	
Actuated g/C Ratio		0.18		0.18	0.18			0.74			0.74	
Clearance Time (s)		4.0		4.0	4.0			4.0			4.0	
Lane Grp Cap (vph)		250		151	321			1863			2395	
v/s Ratio Prot					0.08							
v/s Ratio Perm		c0.14		0.08				c0.33			0.28	
v/c Ratio		0.75		0.44	0.43			0.45			0.38	
Uniform Delay, d1		38.9		36.5	36.5			5.1			4.7	
Progression Factor		0.98		1.00	1.00			1.00			0.37	
Incremental Delay, d2		18.7		9.2	4.2			0.8			0.4	
Delay (s)		57.0		45.7	40.7			5.8			2.1	
Level of Service		E		D	D			A			A	
Approach Delay (s)		57.0			42.2			5.8			2.1	
Approach LOS		E			D			A			A	
Intersection Summary												
HCM Average Control Delay		12.7						HCM Level of Service		B		
HCM Volume to Capacity ratio		0.51										
Actuated Cycle Length (s)		100.0						Sum of lost time (s)		8.0		
Intersection Capacity Utilization		77.0%						ICU Level of Service		D		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 18: University Dorns & Sherman Street

Background PM (North)

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	1	1004	3	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1	1091	3	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (ft)					299	
pX, platoon unblocked						
vC, conflicting volume	1093	547			1095	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1093	547			1095	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	209	481			633	
Direction, Lane #	WB 1	NB 1	NB 2			
Volume Total	1	728	367			
Volume Left	0	0	0			
Volume Right	1	0	3			
cSH	481	1700	1700			
Volume to Capacity	0.00	0.43	0.22			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	12.5	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	12.5	0.0				
Approach LOS	B					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			37.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
34: 10th Avenue & Florida Avenue

Total Future AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	SER2
Lane Configurations												
Sign Control		Stop			Stop			Stop		Stop		
Volume (vph)	11	33	6	28	27	243	10	230	15	165	175	29
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)	12	36	7	30	29	264	11	250	16	179	190	32
Direction, Lane #	EB 1	WB 1	NB 1	SE 1	SE 2							
Volume Total (vph)	54	324	277	179	222							
Volume Left (vph)	12	30	11	179	0							
Volume Right (vph)	7	264	16	0	32							
Hadj (s)	0.01	-0.44	0.01	0.53	-0.07							
Departure Headway (s)	6.4	5.4	5.7	6.5	5.9							
Degree Utilization, x	0.10	0.48	0.44	0.33	0.37							
Capacity (veh/h)	469	627	585	523	576							
Control Delay (s)	10.1	13.2	13.2	11.5	11.1							
Approach Delay (s)	10.1	13.2	13.2	11.3								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay			12.3									
HCM Level of Service			B									
Intersection Capacity Utilization			53.4%			ICU Level of Service			A			
Analysis Period (min)			15									