Item # 5

2011 Congestion Monitoring Program Findings

Travel Forecasting Subcommittee

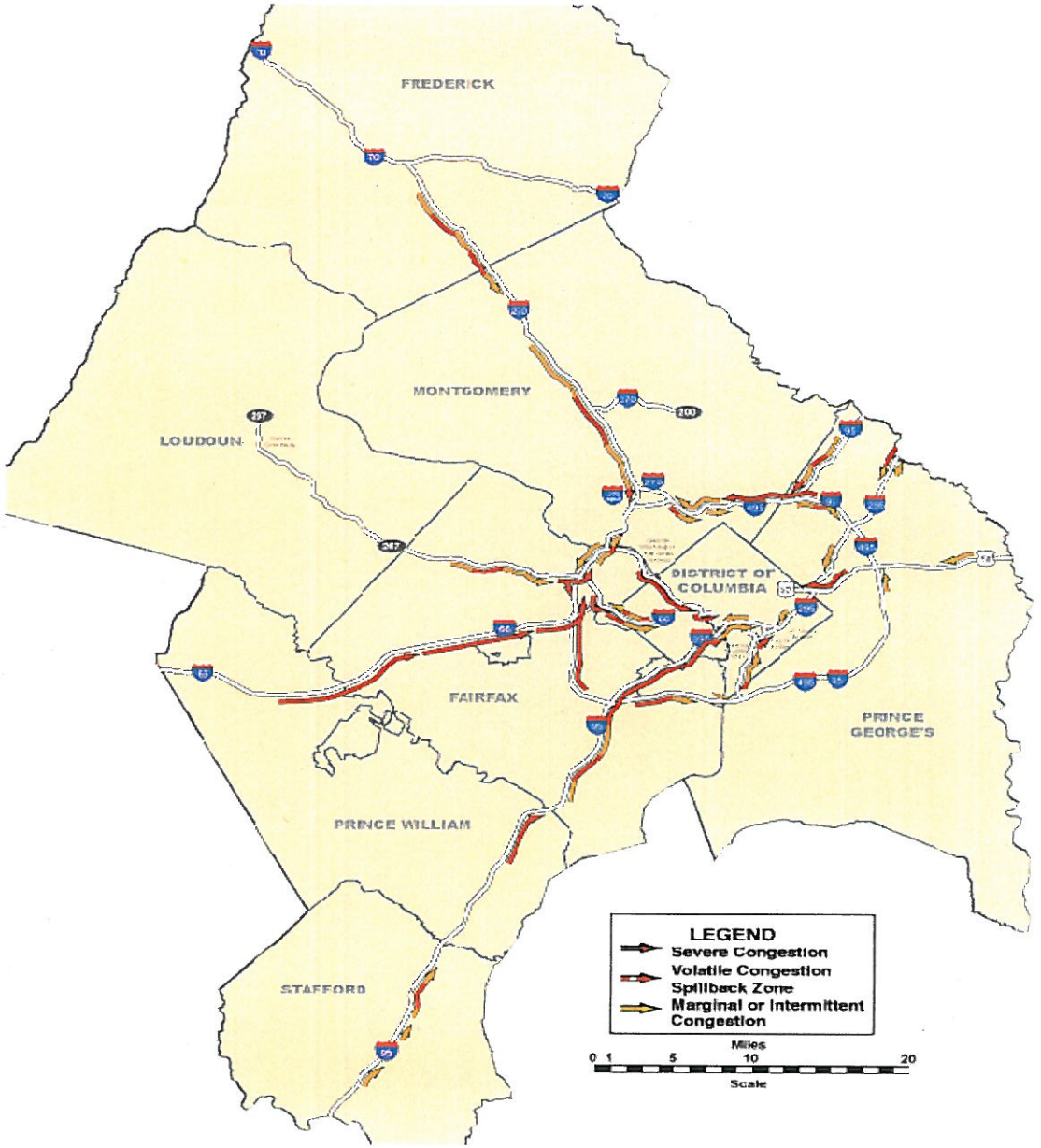
November 18, 2011

- **Purpose**
  - To identify locations, severity and extent of congestion on the major highways in the region as an input to the Congestion Management Process
  - Speed, volume, delay data used for model (travel demand/emissions) valiation
  - Identifying operational characteristics and developing low cost solutions for congestion problems
  - Identifying bottlenecks on the freeways and arterial highways
  - Developing historical trends and changes over time
  - Availability of visual media for studying impact of construction activities

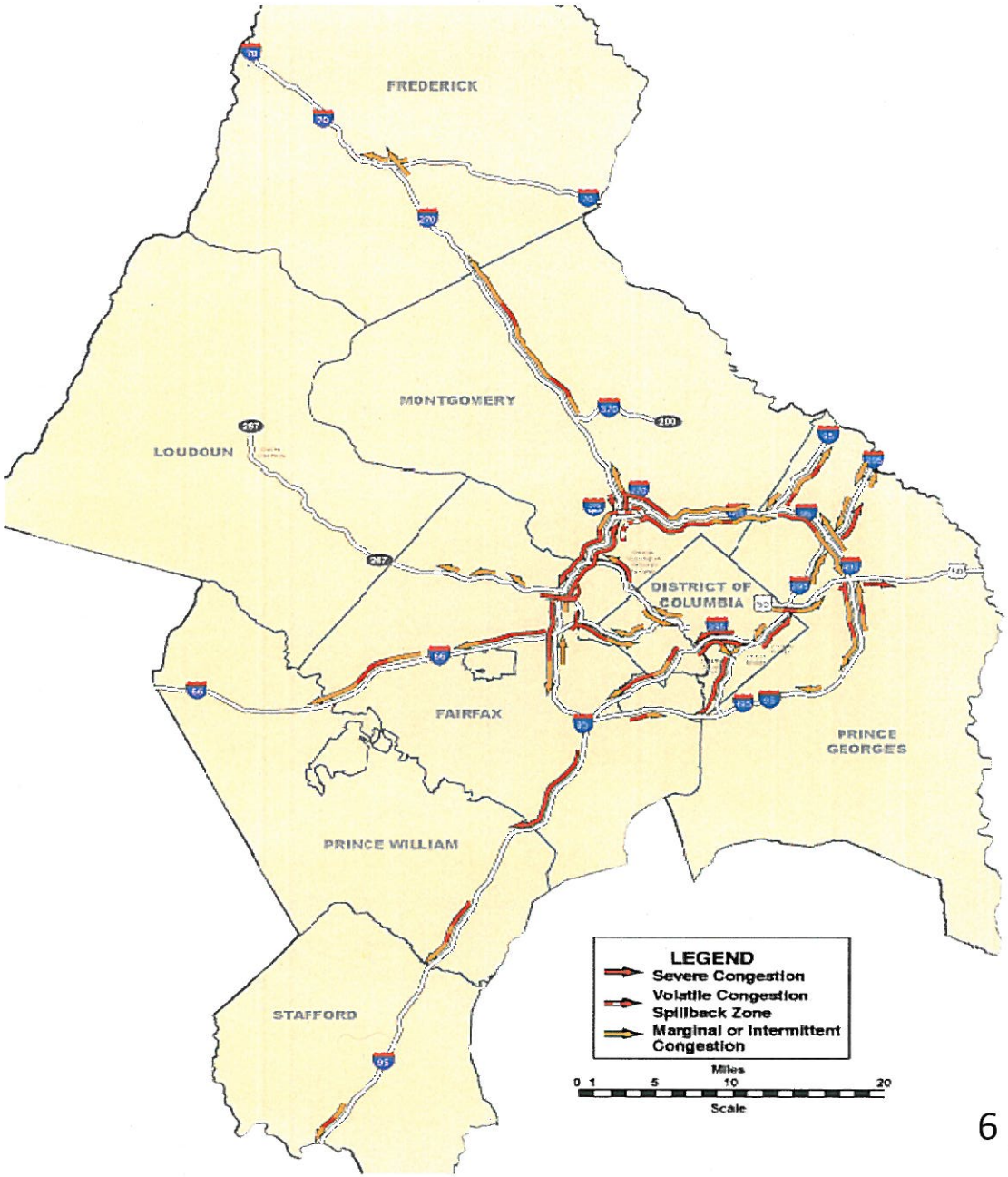
- Background (Freeway)
- Consultant – SKYCOMP; Staff – Daivamani Sivasailam
  - Freeway Congestion Monitoring Program in existence since 1993 and repeated every three years
  - Entire freeway system, parkways and additional facilities such as Dulles Toll Road, US 50 (MD)
  - 4 days of overlapping pictures covering 3 hours of AM and PM peak period
  - Vehicles counted and density of the facility calculated
  - Volume and speed estimated using density
  - Performance depicted as levels of service
  - Performance compared with previous surveys

- Analysis
  - LOS of service and speed for the surveyed facilities for the hours surveyed
  - "Top Ten" congested locations (bottlenecks) based on density
  - "Top Ten" congested corridors (travel time)
  - Changes to the performance over time; improvement or degradation with reasons where possible
  - Comparisons with INRIX speed data on freeways
  - Review of CLRP/TIP with the congested locations

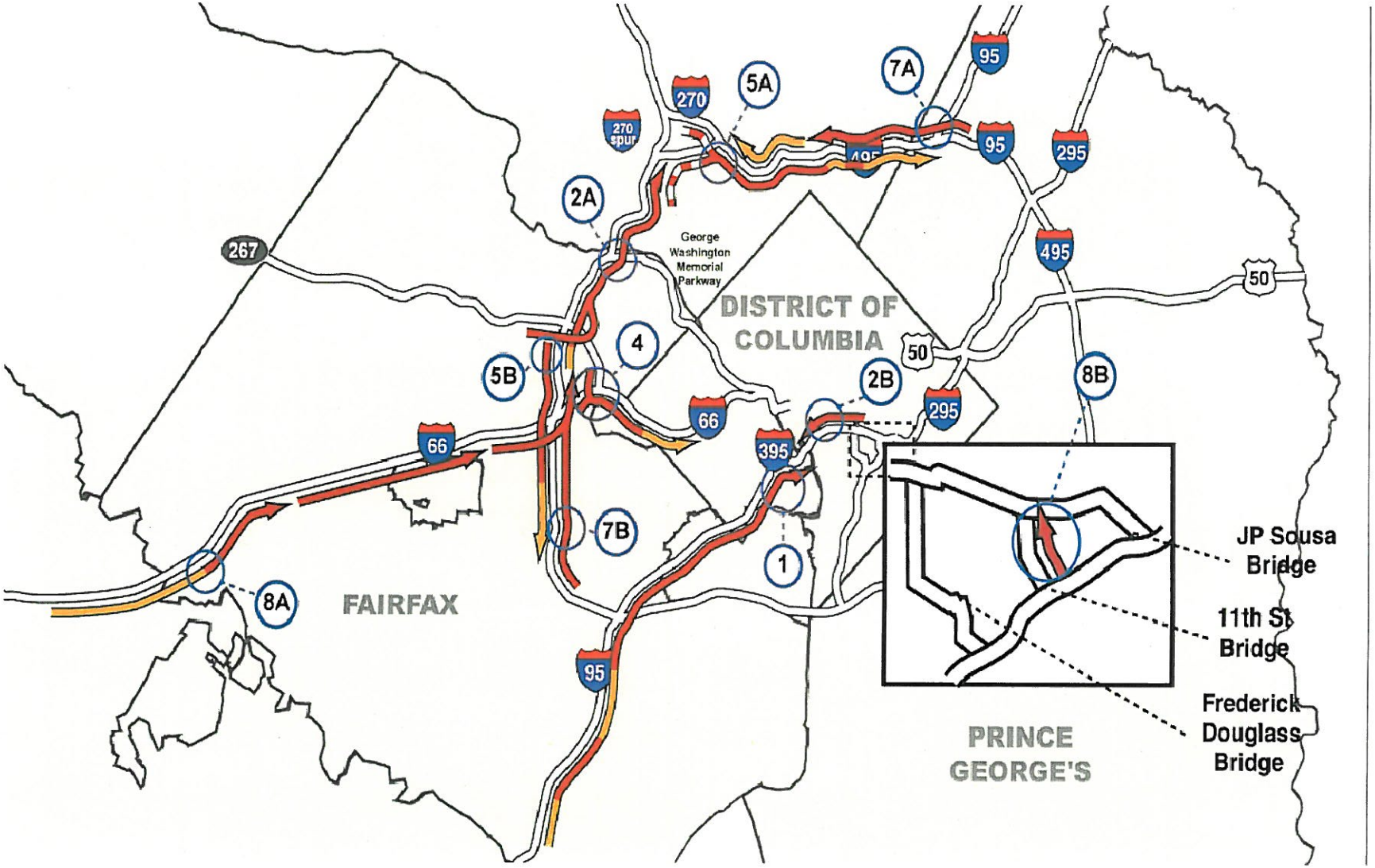
2011 AM Peak Period Performance



2011 PM Peak Period Performance



2011 Top Ten Bottlenecks



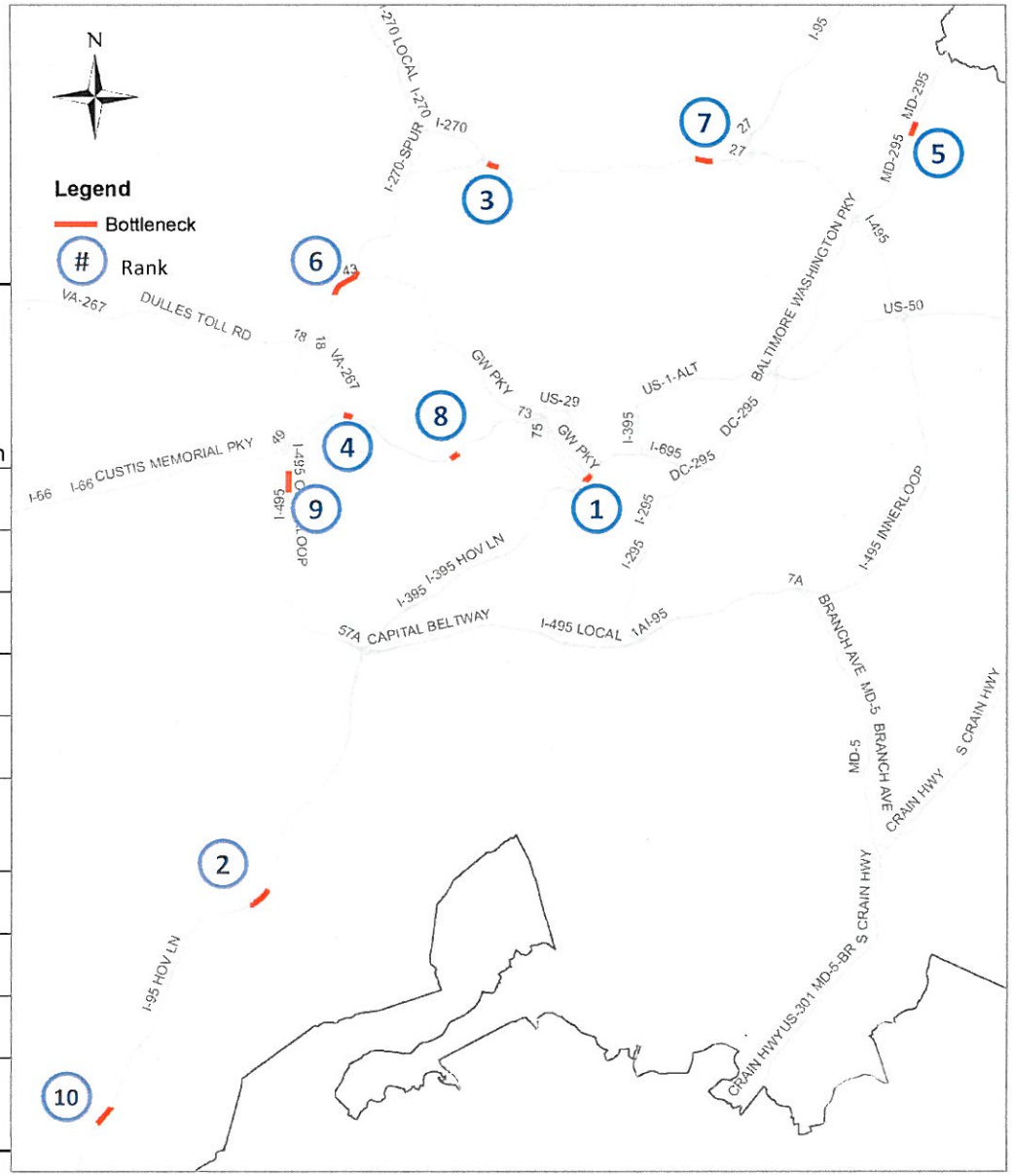
2011 Top Ten Bottlenecks

Rank	Route	From	To	Density (pcplpm)	Speed Range
1*	NB I-395 (8:30 to 9:30 AM)	VA 27 (Washington Blvd)	VA 110 (Jefferson Davis Hwy)	145	5 MPH
2A	IL I-495 (5:30 to 6:30 PM)	VA 193 (Georgetown Pike)	George Washington Mem Pkwy	125	5 to 10 MPH
2B	SB I-395/SW Fwy (6:00 to 7:00 PM)	4th St	12th St	125	5 to 10 MPH
4	EB I-66 (6:00 to 7:00 PM)	VA 7 (Leesburg Pike)	Dulles Access	115	7 to 12 MPH
5A	IL I-495 (4:30 to 5:30 PM)	MD 355 / I-270	MD 185 (Connecticut Ave)	110	10 to 15 MPH
5B*	OL I-495 (5:30 to 6:30 PM)	VA 267 (Dulles Toll Rd)	VA 123 (Chain Bridge Rd)	110	10 to 15 MPH
7A	OL I-495 (8:00 to 9:00 AM)	I-95	MD 650 (New Hampshire Ave)	105	12 to 20 MPH
7B*	IL I-495 (8:00 to 9:00 AM)	Gallows Rd	US 50 (Arlington Blvd)	105	12 to 20 MPH
8A	EB I-66 (7:00 to 8:00 AM)	VA 234 Bypass	VA 234 (Sudley Rd)	95	15 to 25 MPH
8B*	WB 11th St Bridge (7:30 to 8:30 AM)	I-295	Southeast Fwy	95	15 to 25 MPH

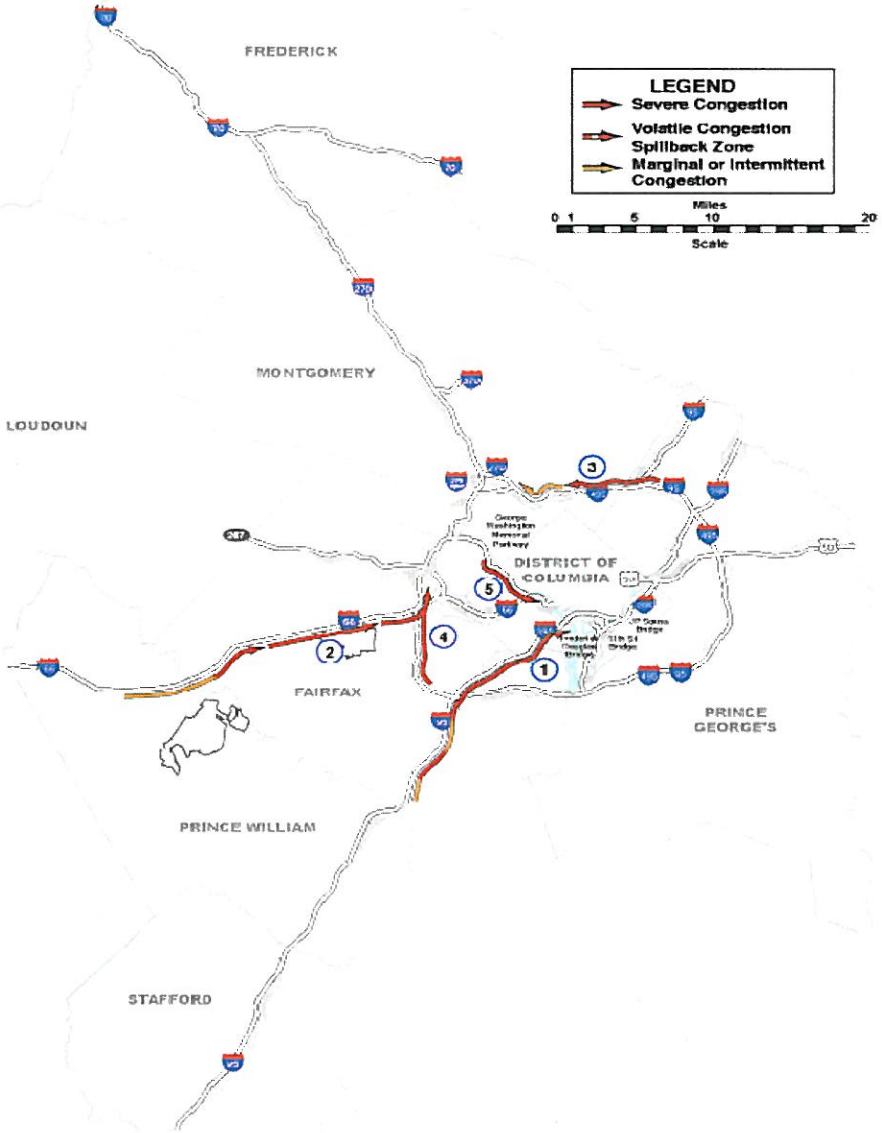
* While impacted by construction, these links are historically congested

INRIX 2nd Quarter Ten Congested Locations

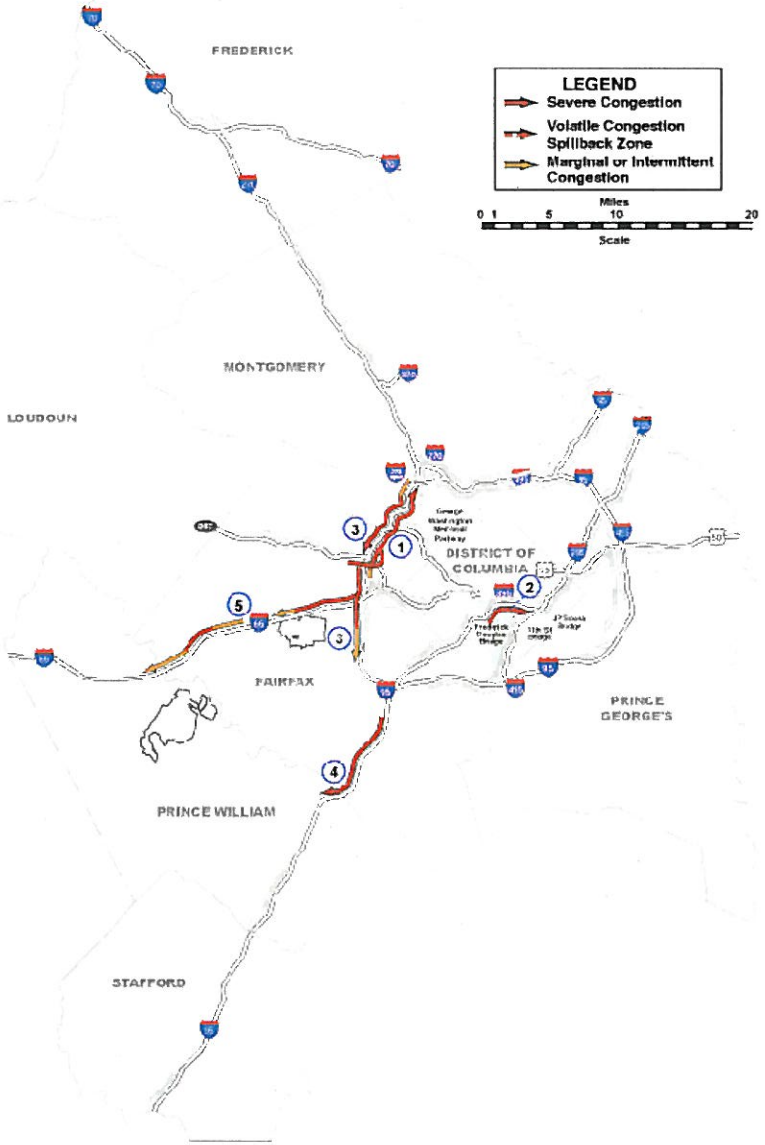
Rank	Road/ Direction	Location	Speed when congested (mph)	Weekly hours of congestion
1	I-395 NB	11TH ST/EXIT 11	23	73
2	I-95 SB	US-1/EXIT 161	29	57
3	I-495 IL	MD-355//EXIT 34	26	35
4	I-66 EB	VA-267/EXIT 67	33	49
5	MD-295 NB	POWDER MILL RD	30	42
6	I-495 OL	GW PKWY/EXIT 14	31	44
7	I-495 OL	MD-650/EXIT28	28	33
8	I-66 WB	FAIRFAX DR/EXIT 71	35	48
9	I-495 IL	US-50//EXIT 50	33	43
10	I-95 HOV SB	END OF HOV	35	44



2011 AM Longest Delay Corridors



2011 PMLongest Delay Corridors



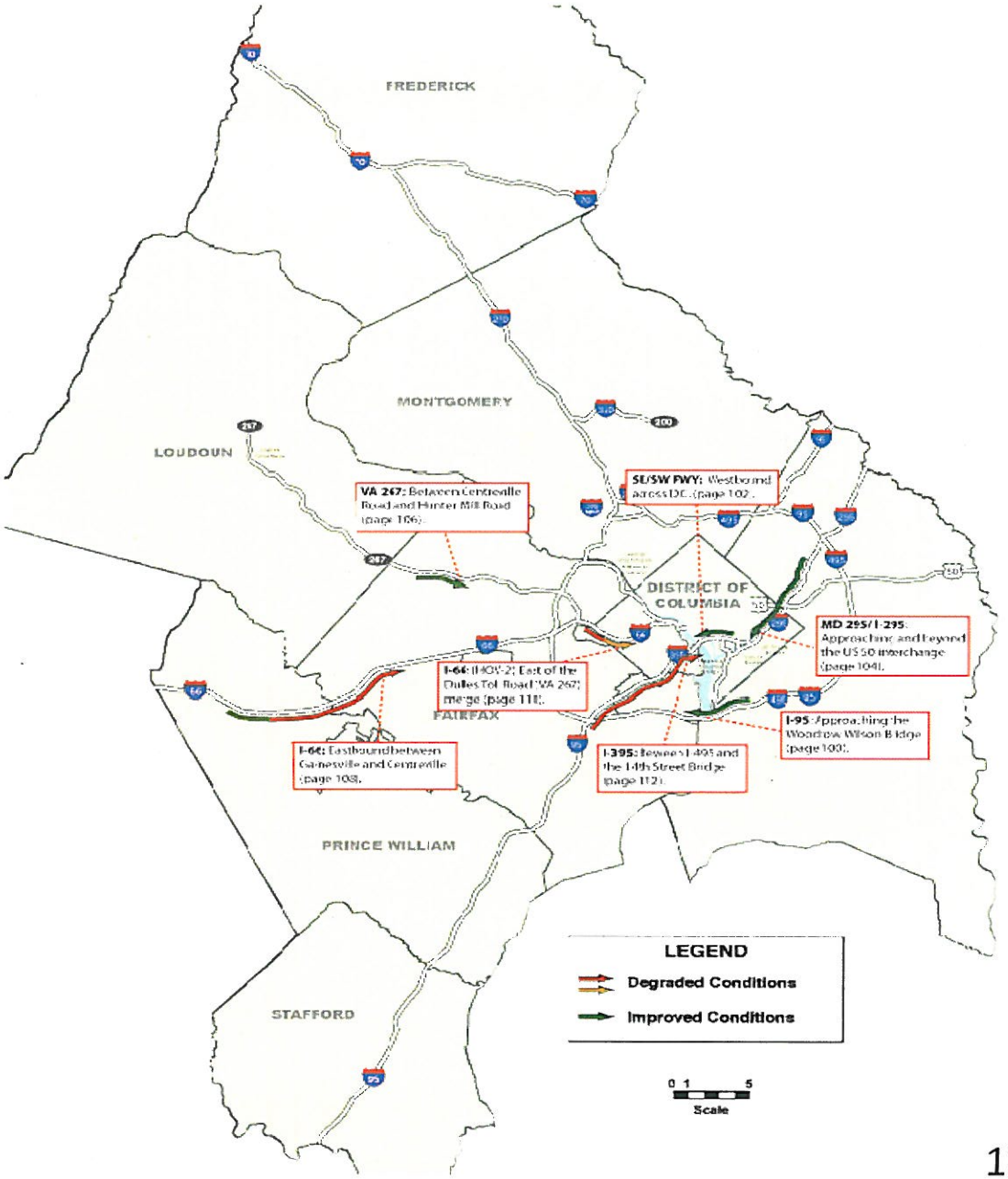
AM Peak

Site Name	Road Name	Time	Direction	From	To	Queue Length (miles)	Estimated Travel Time (minutes)	Estimated Speed (mph)	Estimated Delay (minutes)
Site #1	I-95/I-395	7:30 – 8:30	Northbound	US 1	GWMP	18.3	62.8	18	44.4
Site #2	I-66	7:00 – 8:00	Eastbound	VA 234 Bypass	I-495	19.4	48.0	24	28.6
Site #3	I-495	7:00 – 8:00	Outerloop	US 1	I-270	10.0	28.7	21	18.7
Site #4	I-495	8:00 – 9:00	Innerloop	I-95	I-66	8.0	24.9	19	16.9
Site #5	GWMP	7:30 – 8:30	Eastbound	Chain Bridge Rd	I-66	5.3	16.5	19	11.2

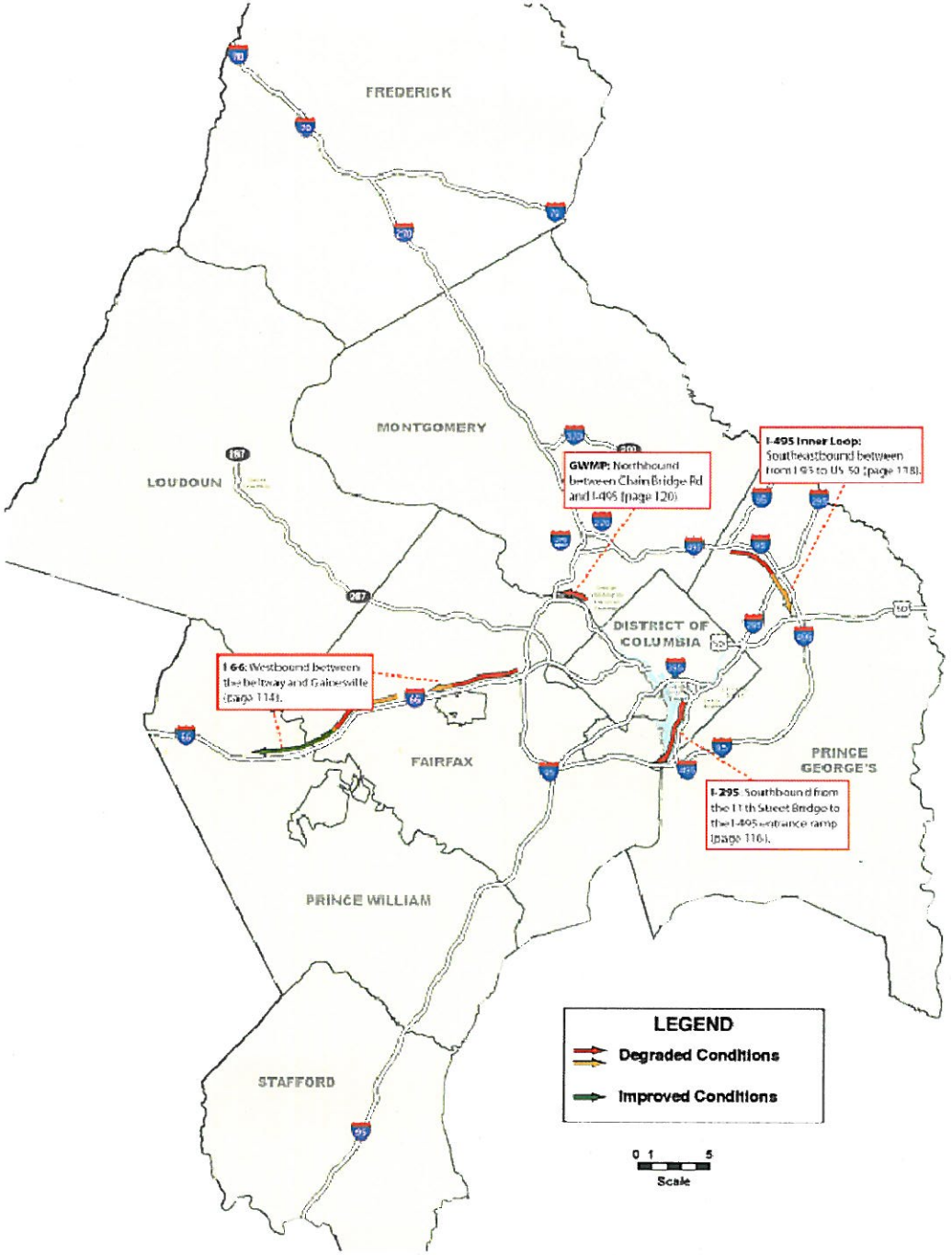
PM Peak

Site Name	Road Name	Time	Direction	From	To	Queue Length (miles)	Estimated Travel Time (minutes)	Estimated Speed (mph)	Estimated Delay (minutes)
Site #1	I-495	5:30 – 6:30	Innerloop	VA 7	I-270 Spur	10.3	41.8	15	31.5
Site #2	I-395	5:00 – 6:00	Northbound	VA 110	Pennsylvania Ave	4.3	19.2	13	14.9
Site #3	I-495	4:30 – 5:30	Outerloop	MD 187	VA 236	8.8	22.6	23	13.8
Site #4	I-95	4:30 – 5:30	Southbound	I-495	VA 123	9.7	22.4	26	12.8
Site #5	I-66	4:30 – 5:30	Westbound	I-495	VA 234	16.8	28.3	36	11.5

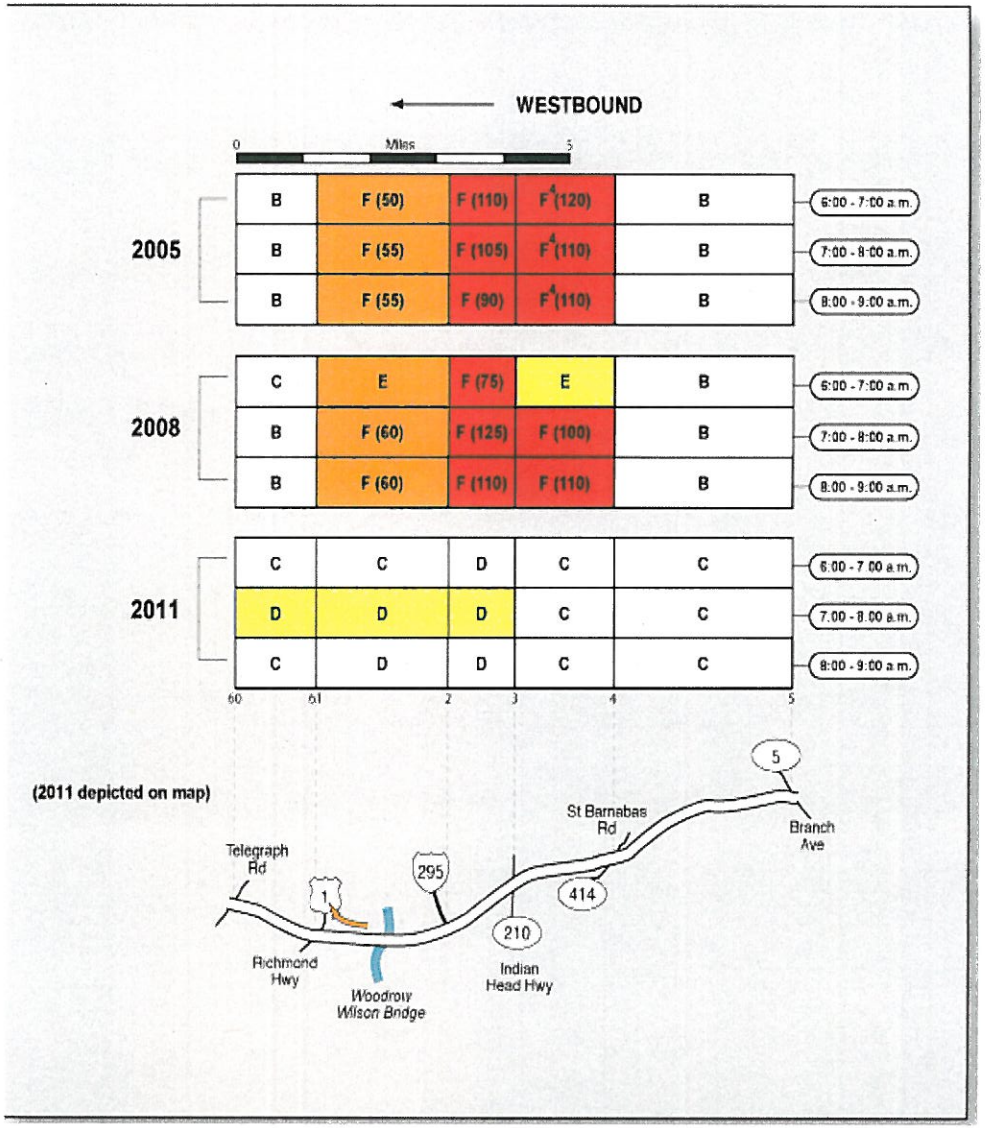
2011 Significant Changes AM Peak Period



2011 Significant Changes PM Peak Period



Changes to I-95 as a result of Wilson Bridge Improvements

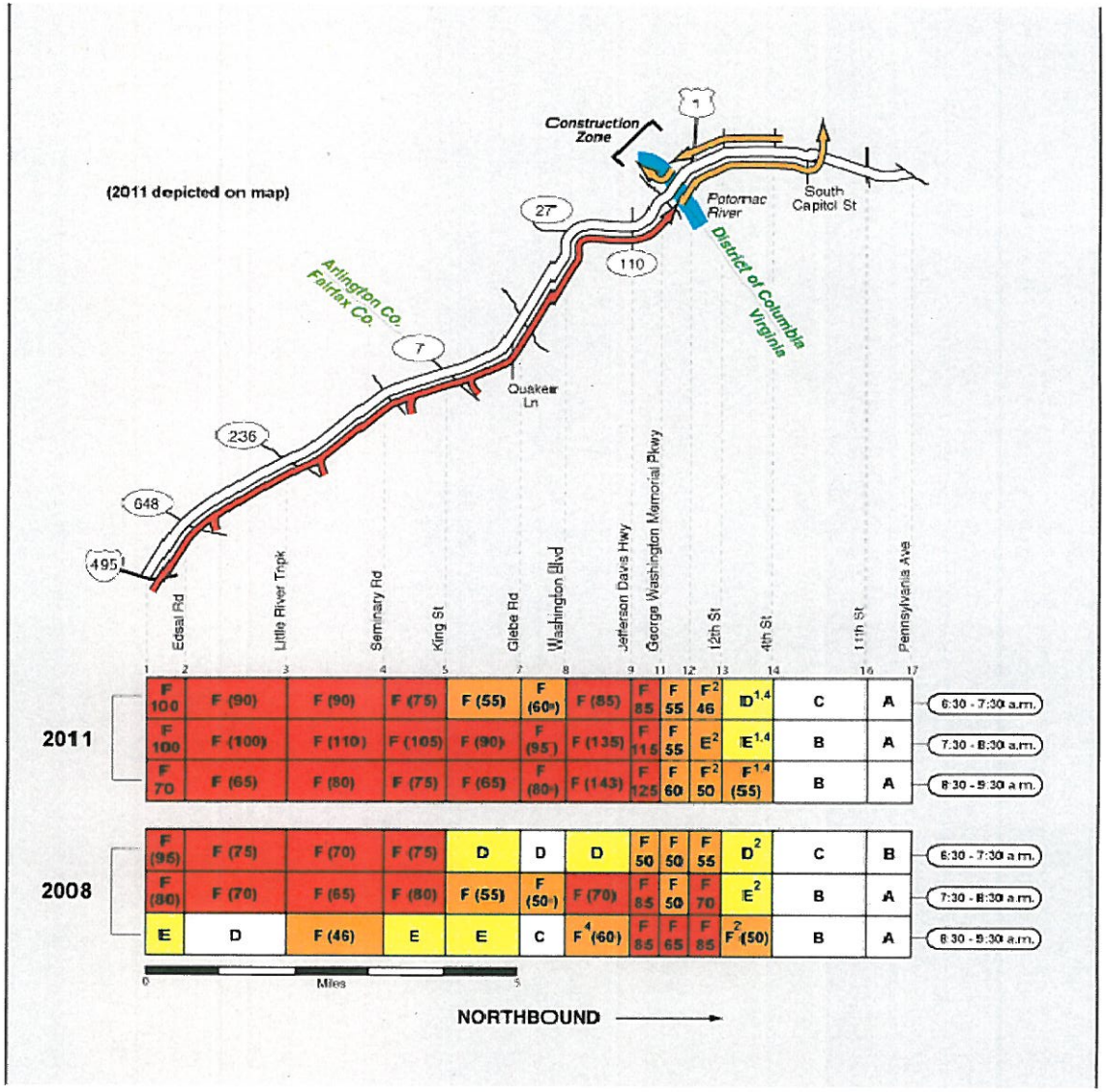


Capital Beltway / I-95 Maryland (Prince George's County) - Morning

2002

2011

Changes to I-395 high demand



I-395 Virginia (Arlington County) - Morning

Photo Set One: 2008

Photo Set One: 2011

Photo Set One (Above):
The top photograph from 2008 shows normal flow in the vicinity of Quaker Lane and Glebe Rd, in-between the two large congestion zones. The bottom photo from 2011 shows the extremely high densities that typically extended for a large part of the distance.

Photo Set Two: 2008

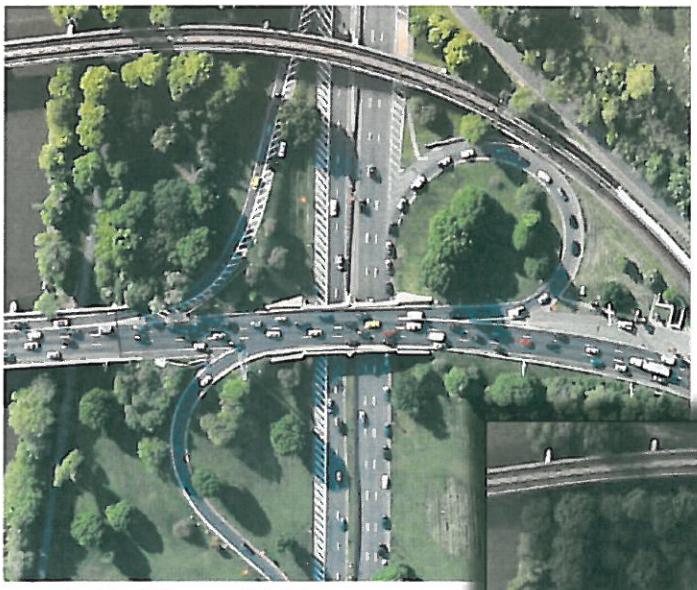
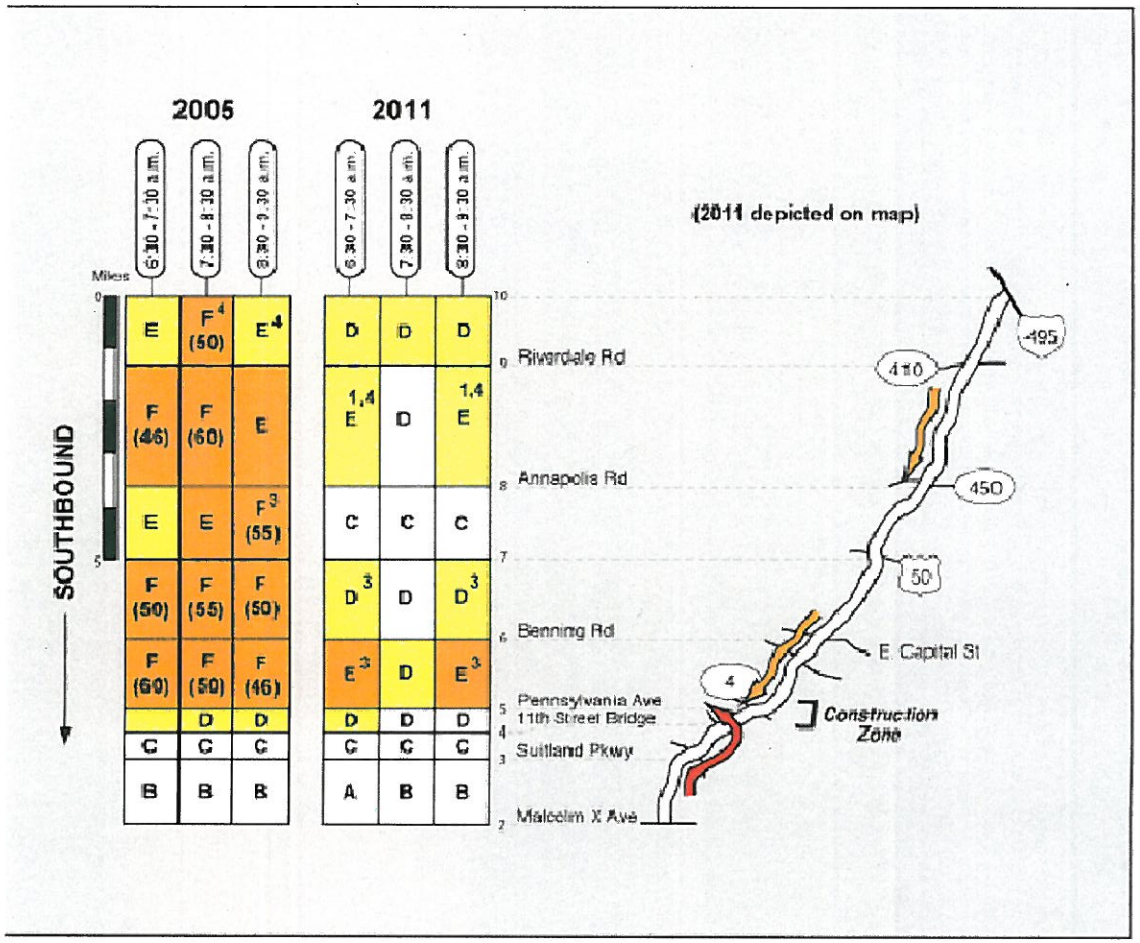


Photo Set Two: 2011

Photo Set Two (above and right):
This pair shows the normal configuration of the lanes at the GWP merge in 2008, and then it shows the modifications needed for the rehabilitation work in 2011.

Changes to I-295



MD 295 Maryland (Prince Georges County) and DC 295 (Kenilworth Ave NE / District of Columbia) -

Photo Set One: 2005

Photo Set One: 2011

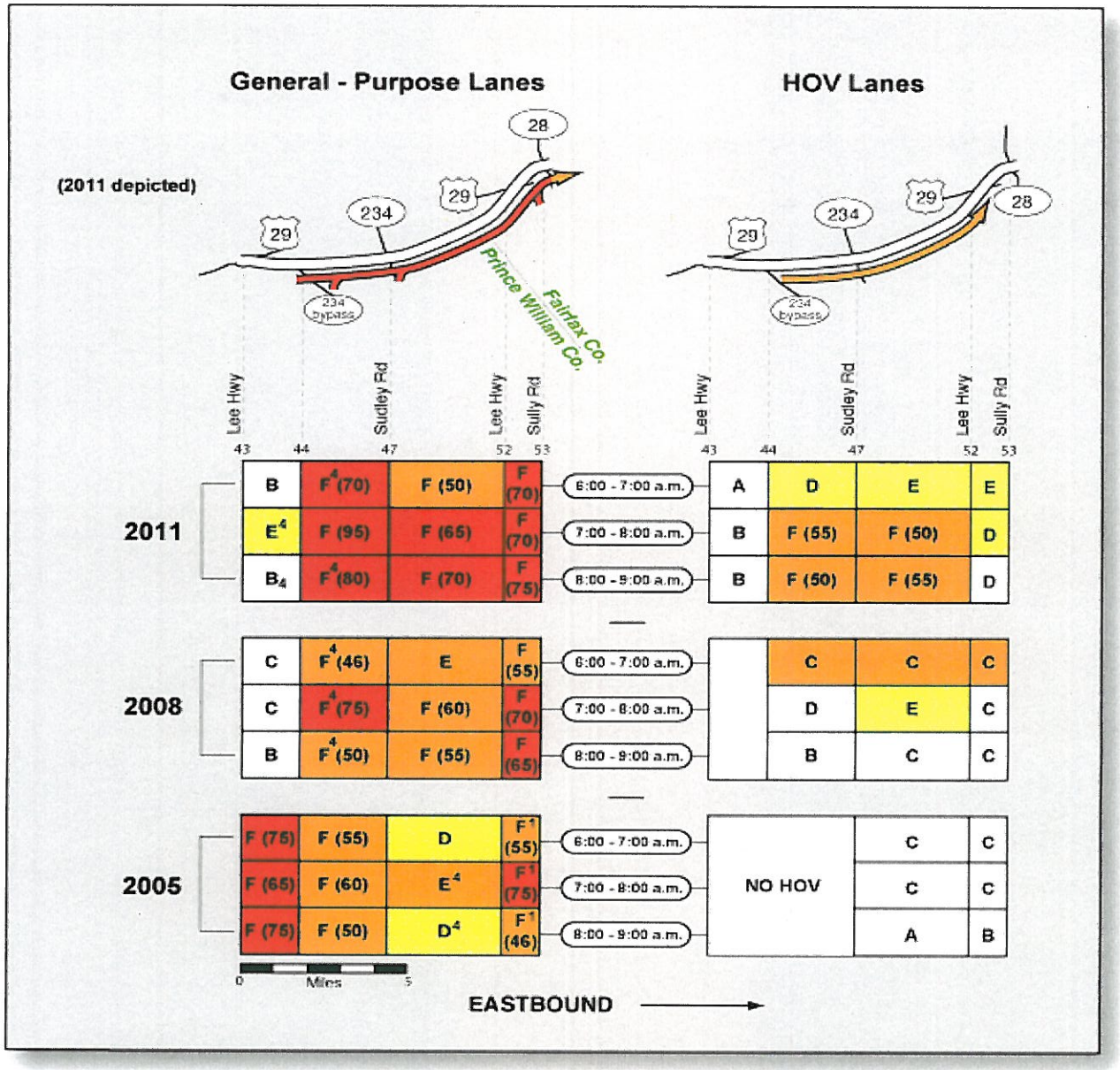
Photo Set One: This pair of photographs show the reconfiguration of the Nannie Helen Burroughs Ave NE interchange between 2005 and 2011. Note the lengthened deceleration lane to the right side of the 2011 image.

Photo Set Two: 2005

Photo Set Two: These photographs show the 2005 (top) and 2011 (bottom) configuration of the DC 295 bridge across the Northeast Corridor railroad right-of-way; note the absence of a significant merge lane in the 2005 photograph, and the friction that caused for southbound traffic on DC 295.

Photo Set Two: 2011

I-66


General - Purpose Lanes
HOV Lanes
(2011 depicted)
28
29
234
29
234 bypass
Prince William Co.
Fairfax Co.
Lee Hwy
Sudley Rd
Lee Hwy
Sully Rd
43
44
47
52
53
2011
B
F4(70)
F (50)
F (70)
6:00 - 7:00 a.m.
E4
F (95)
F (65)
F (70)
7:00 - 8:00 a.m.
B4
F4(80)
F (70)
F (75)
8:00 - 9:00 a.m.
A
D
E
E
B
F (55)
F (50)
D
B
F (50)
F (55)
D
2008
C
F4(46)
E
F (55)
6:00 - 7:00 a.m.
C
F4(75)
F (60)
F (70)
7:00 - 8:00 a.m.
B
F4(50)
F (55)
F (65)
8:00 - 9:00 a.m.
C
C
C
D
E
C
B
C
C
2005
F (75)
F (55)
D
F1 (55)
6:00 - 7:00 a.m.
F (65)
F (60)
E4
F1 (75)
7:00 - 8:00 a.m.
F (75)
F (50)
D4
F1 (46)
8:00 - 9:00 a.m.
NO HOV
C
C
C
C
A
B
0
Miles
5
EASTBOUND

I-66 Virginia (Prince William County) - Morning

Photo Set One: 2005

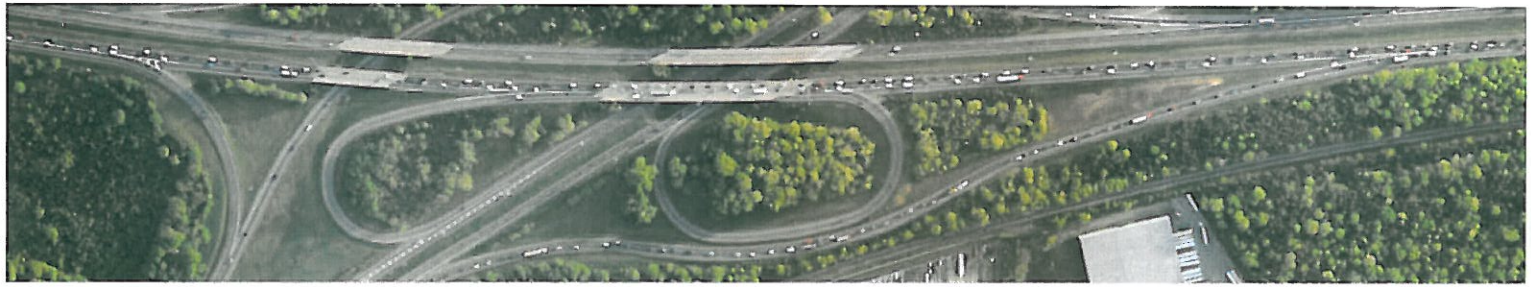


Photo Set One: 2011

Photo Set One: both photogr show I-66 at the Lee Highway interchange in Gainesville. Th 2005 photograph (top) shows eastbound congestion in 200 to widening; the 2011 photogr (bottom) shows that free flow conditions prevailed here duri the 2011 survey period (as the during 2008; see graphic).

Photo Set Two: 2005

Photo Set Two: these two photos show how congestion has filled in east of Gainesville; the interchange at Sudley Road in Manassas is shown (2005 top; 2011 bottom).

Photo Set Two: 2011

Summary of Findings

- Lane miles of congestion has increased in 2011 compared to 2008
- Peak spreading is occuring with congestion on facilities spreading to all three hours from the peak hour
- Construction activity results in higher densities and lower speeds

Projects in CLRP/TIP That Address Bottlenecks and Congested Corridors

- I-270/US15 Corridor from Shady Grove to I-70 under study
- I-495 HOT lane project from Springfield to American Legion Bridge (underway)
- I-95 HOT lane project from Prince William County to Capital Beltway (underway)
- I-395 HOT lane project from Capital Beltway to the 14th Street bridge
- Inter County Connector opening on November 22,2011
- I-66 HOV widening and HOV additions
- Corridor Cities Transitway
- Purple Line
- Cherry Hill VRE Station

- Background (Arterial highways)
- Staff – Anant Choudhary
  - Begun in FY2000, with annual surveys; all routes are monitored on a three year cycle
  - Monitor 57 (9 new) major arterial highway routes totaling 430 center line miles
  - Program expanded in FY2009 to include additional routes covering 65 miles
  - FY2011 Study surveyed 144 miles including 21 miles of new routes
  - Performance depicted as levels of service
  - Performance compared with previous surveys

Performance Analysis / Methodology

- Four cars equipped with Global Positioning system (GPS) were used to record travel time and speed data on each route between 1 PM to 8 PM on week days covering the PM peak period and off-peak period
- Maryland SHA deployed blue tooth readers on two routes in Maryland and collected speed data concurrent with our survey; waiting for analysis results
- Level of Service (LOS) for the routes is determined using speed data and the 2000 Highway Capacity Manual procedure
- LOS E & F are considered as congestion
- Average travel speed between segments along the route used to determine segment LOS during the PM peak hour, peak period and off-peak period
- Results compared with the findings of previous survey

Schedule and Routes
Arterial Travel Time Data collection

Jurisdiction	FY 2000 FY 2003 FY 2006 FY 2009		FY 2001 FY 2004 FY 2007 FY 2010		FY 2002 FY 2005 FY 2008 FY 2011		Total
	Routes	Mileage	Routes	Mileage	Routes	Mileage	
Maryland	MD 355 Segment 1 & 2	15.3	MD 4	11.5	Georgia Avenue (MD 97) Segment 1 & 2	9.5	
	MD 117	6.8	MD 586	5.4	MD 5	11.9	
	MD 198	5.0	MD 450	12.8	MD 28	9.0	
	MD 197	14.7	MD 144	4.2	MD 193 (University Blvd.)	4.2	
	US-1 (Baltimore Av.) * Segment 1 & 2	13.4	Indian Head Highway *	11.0	Randolph Road	9.1	
	MD 193 *	4.6			Colesville Road / US29 *	7.1	
		59.8		44.9		50.8	155.5
Virginia	US 50 Segment 1 & 2	23.0	VA 234	22.6	FFX County Parkway	19.7	
	US 15	12.5	VA 28	17.0	US 1 Segment 1 & 2	18.8	
	VA 123 Segment 1, 2 & 3	27.7	VA 120	8.1	US 29 Segment 1, 2, 3	21.0	
	Wilson Boulevard *	4.9	VA 7	29.3	US 29 * Segment 4	11.1	
			VA 28 *	7.0			
		68.1		84.0		70.6	222.7
District of Columbia	Wisconsin Avenue	4.1	Canal Road / M Street NW	3.7	14th Street NW	1.0	
	Pennsylvania Avenue	1.1	7th Street NW / Georgia Avenue	3.4	16th Street NW	6.1	
	17th Street NW	0.7	Georgia Avenue	3.3	Connecticut Avenue NW	4.0	
	Independence Avenue	1.9	Constitution Ave / Louisiana Avenue	2.4	K Street NW/New York Avenue	4.2	
	I Street NW	0.8	Pennsylvania Avenue SE / Branch Avenue	3.7	Military Road / Nebraska Avenue	2.5	
	H Street NW	0.6			Pennsylvania Avenue NW	0.8	
	15th Street NW	0.7			L Street NW	1.1	
	16th Street NW **	6.1			South Dakota *	2.7	
	L Street NW **	1.2					
	Rhode Island Av. (US-1) *	3.3					
		20.5		16.5		22.4	59.4
TOTAL		148.4		145.4		143.8	430.3

* New Routes studies since FY 2009 & constitute 65.1 miles

Route Details

Routes (FY 2011)
Arterial Travel Time Data Collection

		Route Limits		Distance
Jurisdiction	Route	From	To	miles
MD	Georgia Avenue / MD 97 - Segment 1	Eastern Avenue	MD 193 (University Boulevard)	4.3
	Georgia Avenue / MD 97 - Segment 2	University Boulevard	MD 28	5.2
	MD 5	Suitland Parkway	Accokeek Road	11.9
	MD 28	Viers Mill Road	New Hampshire Avenue	9.0
	MD 193 (University Boulevard)	Connecticut Avenue	US 29	4.2
	Randolph Road	MD 355	Columbia Pike / US 29	9.1
	Colesville Rd / US29 *	East-West Highway	Fairland Road	**7.1**
MD Total				**50.8**
VA	Fairfax Co. Parkway - Segment 1	Sunrise Valley Road	Lee Highway	7.2
	Fairfax Co. Parkway - Segment 2	Lee Highway	Rolling Road	12.5
	US 1 - Segment 1	20th Street	Boswell Avenue	8.1
	US 1 - Segment 2	Boswell Avenue	VA 123	10.7
	US 29 - Segment 1	M Street NW	Park Road	7.9
	US 29 - Segment 2	Park Road	Village Drive	6.5
	US 29 - Segment 3	Village Drive	Bull Run PO Road	6.6
	US 29 * - Segment 4	Bull Run Post Office Road	Buckland Mill Road	**11.1**
VA Total				**70.6**
DC	14th Street NW	Independence Avenue	K Street NW	1.0
	16th Street NW	K Street NW	Eastern Avenue	6.1
	Connecticut Avenue NW	K Street NW	Nebraska Avenue	4.0
	K Street NW / New York Avenue	21st Street NW	Bladensburg Road	4.2
	Military Road / Nebraska Avenue	Connecticut Avenue	Georgia Avenue	2.5
	Pennsylvania Avenue NW	15th Street NW	Constitution Avenue	0.8
	L Street NW	Pennsylvania Avenue	14th Street NW	1.1
	South Dakota *	Bladensburg Road	Hamilton Street NE	**2.7**
DC Total				**22.4**
Regional Total Length				**143.8**

* New Routes

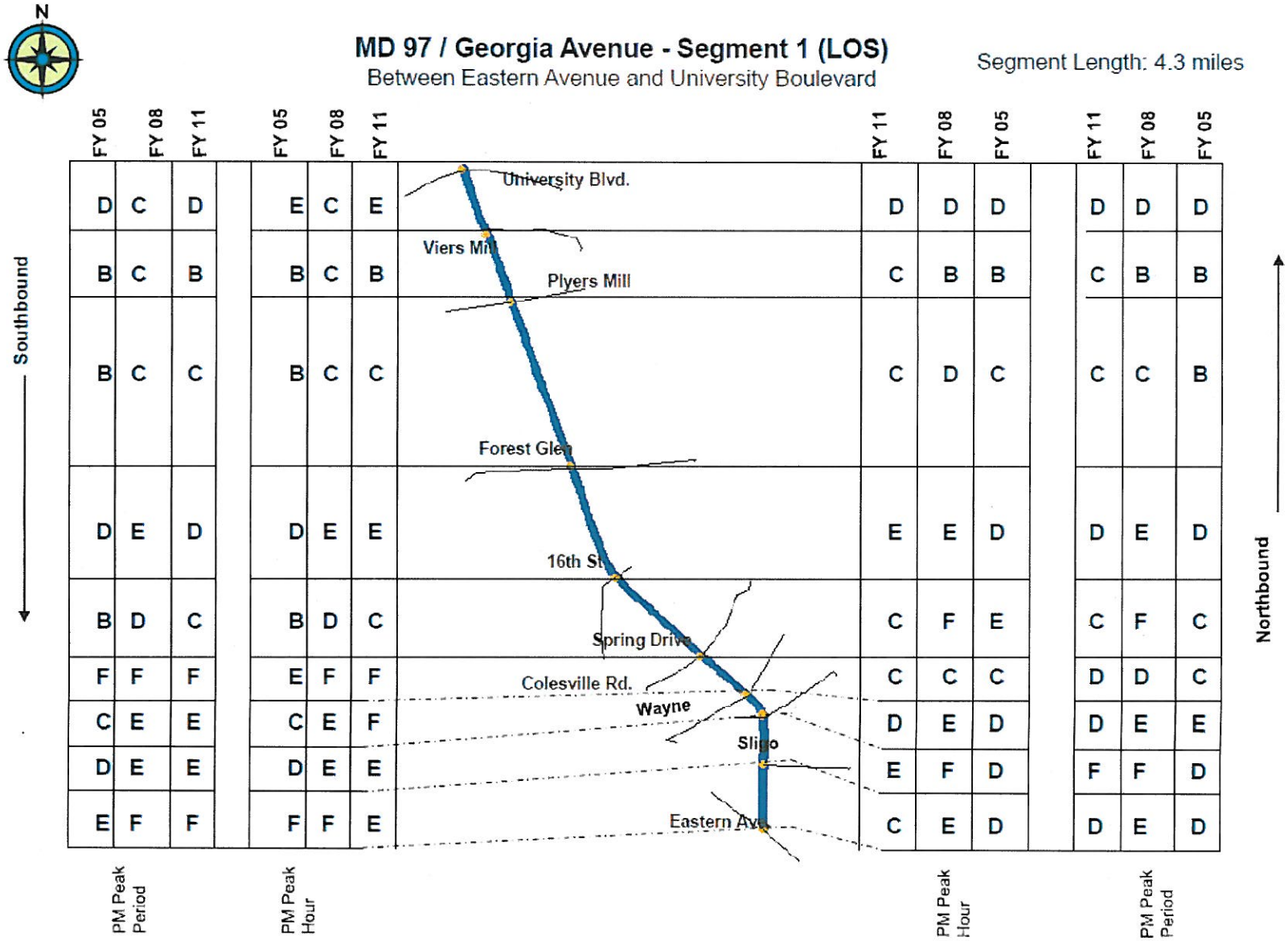
Summary of LOS (FY 2011)

Jurisdiction	Route	LOS (Peakhour)		LOS (Peak Period)		LOS (Off Peak Period)	
		North/ Eastbound	South/ Westbound	North/ Eastbound	South/ Westbound	North/ Eastbound	South/ Westbound
MD	Georgia Avenue / MD97 - Segment 1	D	D	D	D	D	D
	Georgia Avenue / MD97- Segment 2	F	D	F	D	D	D
	MD Route 5	A	C	B	C	B	B
	MD Route 28	E	C	E	C	B	C
	University Blvd / MD 193	D	D	D	D	D	C
	Randolph Road	D	C	C	C	C	C
	Colesville Rd / US29 (new)	E	D	D	D	C	C
VA	Fairfax Co. Parkway - Segment 1	B	B	B	B	A	B
	Fairfax Co. Parkway - Segment 2	B	B	B	B	A	A
	US 1 - Segment 1	D	E	D	D	C	C
	US 1 - Segment 2	A	B	A	B	B	A
	US 29 - Segment 1	E	E	E	D	D	D
	US 29 - Segment 2	D	F	E	E	D	E
	US 29 - Segment 3	D	D	D	D	D	C
	US 29 - Segment 4	B	B	B	B	B	A
DC	14th Street NW	E	F	E	F	D	D
	16th Street	C	C	C	C	C	C
	Connecticut Avenue NW	C	E	C	E	D	D
	K Street NW/New York Avenue	F	F	F	E	D	E
	Military Road/ Nebraska Av.	C	C	C	C	C	C
	Pennsylvania Avenue NW	E	E	D	E	E	D
	L Street	E	-	E	-	D	-
	South Dakota Av.	C	C	C	C	C	C

Mileages with LOS E / F

FY 2011 Summary
Mileages with LOS E / F

LOS	PM Peak Hour	
	Mileage	Percentage (%)
Maryland		
A-D	68.7	68
E-F	32.9	32
Total	**101.60**	**100**
Virginia		
A-D	78.1	55
E-F	63.1	45
Total	**141.2**	**100**
District of Columbia		
A-D	25.9	59
E-F	17.9	41
Total	**43.8**	**100**
Region		
A-D	172.7	60
E-F	113.9	40
Total	**286.6**	**100**


N
MD 97 / Georgia Avenue - Segment 1 (LOS)
Between Eastern Avenue and University Boulevard
Segment Length: 4.3 miles
Southbound
Northbound
FY 05 FY 08 FY 11 FY 05 FY 08 FY 11 FY 11 FY 08 FY 05 FY 11 FY 08 FY 05
D C D E C E D D D D D D
B C B B C B C B B C B B
B C C B C C C D C C C B
D E D D E E E E D D E D
B D C B D C C F E C F C
F F F E F F C C C D D C
C E E C E F D E D D E E
D E E D E E E F D F F D
E F F F F E C E D D E D
PM Peak Period
PM Peak Hour
PM Peak Hour
PM Peak Period
University Blvd.
Viers Mill
Plyers Mill
Forest Glen
16th St.
Spring Drive
Colesville Rd.
Wayne
Sligo
Eastern Ave.

Georgia Avenue / MD 97 - From Eastern Avenue to University Boulevard

Peak Hour Travel Time/Speed Summary (5PM-6PM)

	Segments	Mean Travel Time (Minutes)	Travel Speed (MPH) Mean	Travel Speed (MPH) STND DEV	Level of Service(LOS)	Mean Delay (Minutes)	Speed Range (MPH)			LOS Range		
Northbound	Eastern to Sligo	1.1	22.5	3.3	C	0.0	20.3	to	24.8	D	to	C
	Sligo to Wayne	1.3	16.0	8.5	E	0.6	10.3	to	21.7	F	to	D
	Wayne to Colesville	0.6	19.3	8.0	D	0.2	13.9	to	24.6	E	to	C
	Colesville to Spring	0.8	24.2	4.4	C	0.0	21.2	to	27.1	D	to	C
	Spring to 16th St	1.5	25.1	5.6	C	0.2	21.3	to	28.9	D	to	B
	16th St to Forest Glen	3.0	14.8	4.0	E	1.0	12.2	to	17.5	F	to	D
	Forest Glen to Plyers Mill	2.7	24.2	7.2	C	0.6	19.4	to	29.0	D	to	B
	Plyers Mill to Veirs Mill	1.0	26.6	8.7	C	0.2	20.8	to	32.5	D	to	B
	Veirs Mill to University	1.3	20.9	8.1	D	0.4	15.5	to	26.4	E	to	C
	Total--->	13.3	19.2	2.3	D	3.2	17.7	to	20.7	D	to	D
Southbound	University to Veirs Mill	1.6	16.0	6.9	E	0.7	11.3	to	20.6	F	to	D
	Veirs Mill to Plyers Mill	1.0	28.9	9.1	B	0.2	22.8	to	35.0	C	to	B
	Plyers Mill to Forest Glen	2.3	27.7	6.1	C	0.4	23.6	to	31.8	C	to	B
	Forest Glen to 16th St	2.6	16.4	2.9	E	1.0	14.5	to	18.4	E	to	D
	16th St to Spring	1.6	23.0	5.8	C	0.5	19.1	to	26.9	D	to	C
	Spring to Colesville	1.7	11.3	2.1	F	0.7	9.9	to	12.7	F	to	F
	Colesville to Wayne	1.1	11.2	9.5	F	0.7	4.8	to	17.5	F	to	D
	Wayne to Sligo	1.1	16.7	3.9	E	0.3	14.1	to	19.3	E	to	D
	Sligo to Eastern	1.9	13.4	3.9	E	0.7	10.7	to	16.0	F	to	E
	Total--->	14.9	17.2	1.0	D	5.2	16.5	to	17.9	E	to	D

Peak Period Travel Time/Speed Summary (4PM-7PM)

	Segments	Mean Travel Time (Minutes)	Travel Speed (MPH) Mean	Travel Speed (MPH) STND DEV	Level of Service(LOS)	Mean Delay (Minutes)	Speed Range (MPH)			LOS Range		
Northbound	Eastern to Sligo	1.1	21.8	3.6	D	0.1	20.4	to	23.2	D	to	C
	Sligo to Wayne	2.1	11.3	7.2	F	1.2	8.5	to	14.1	F	to	E
	Wayne to Colesville	0.6	17.4	6.9	D	0.2	14.7	to	20.1	E	to	D
	Colesville to Spring	1.1	20.3	8.5	D	0.4	17.0	to	23.6	D	to	C
	Spring to 16th St	1.5	25.8	7.2	C	0.3	23.0	to	28.6	C	to	B
	16th St to Forest Glen	2.2	20.9	6.6	D	0.5	18.3	to	23.4	D	to	C
	Forest Glen to Plyers Mill	2.3	28.0	5.2	C	0.3	25.9	to	30.0	C	to	B
	Plyers Mill to Veirs Mill	1.0	26.1	6.9	C	0.1	23.4	to	28.8	C	to	B
	Veirs Mill to University	1.3	20.3	7.4	D	0.4	17.4	to	23.2	D	to	C
	Total--->	13.3	19.3		D	3.4						
Southbound	University to Veirs Mill	1.5	18.4	8.5	D	0.6	14.9	to	21.9	E	to	D
	Veirs Mill to Plyers Mill	0.9	29.9	8.5	B	0.2	26.4	to	33.4	C	to	B
	Plyers Mill to Forest Glen	2.4	27.1	6.5	C	0.4	24.4	to	29.7	C	to	B
	Forest Glen to 16th St	2.3	18.6	4.1	D	0.8	16.9	to	20.3	E	to	D
	16th St to Spring	1.6	24.2	7.1	C	0.5	21.3	to	27.2	D	to	C
	Spring to Colesville	1.5	12.7	2.1	F	0.6	11.9	to	13.6	F	to	E
	Colesville to Wayne	0.9	14.5	10.3	E	0.5	10.2	to	18.7	F	to	D
	Wayne to Sligo	1.0	16.8	3.7	E	0.3	15.3	to	18.3	E	to	D
	Sligo to Eastern	2.1	12.2	3.6	F	0.8	10.7	to	13.6	F	to	E
	Total--->	14.2	18.0		D	4.8						

Mean Travel Speeds/Times By Direction (1-8 PM)
Georgia Avenue / MD 97 - From Eastern Avenue to University Boulevard

FY 2011

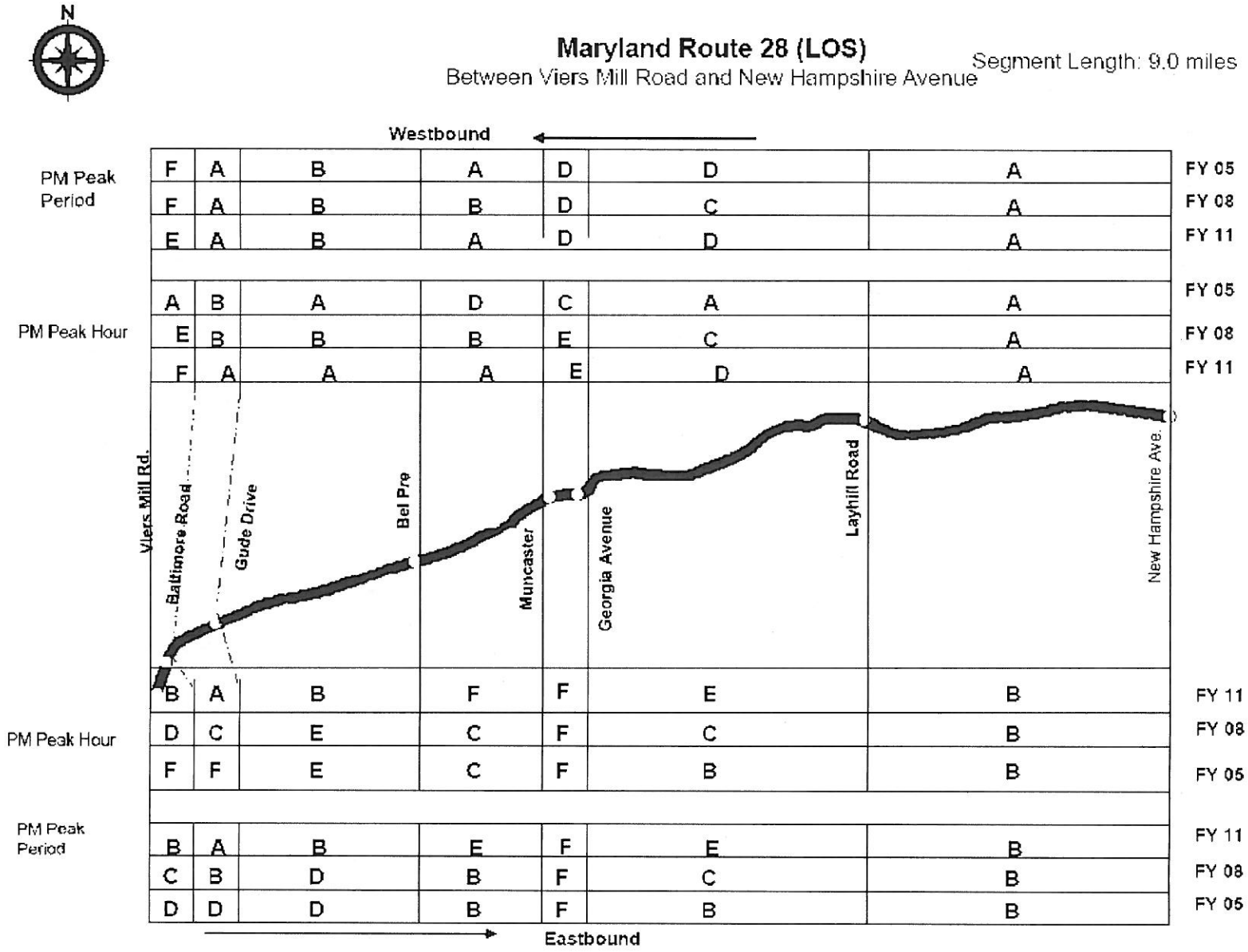
	Northbound					Southbound				
			Travel Speed (MPH)					Travel Speed (MPH)		
Time Period	No. Runs	Mean Travel Time (Minutes)	Mean	Standard Deviation	LOS	No. Runs	Mean Travel Time (Minutes)	Mean	Standard Deviation	LOS
13:00-14:00	3	13.0	19.8	1.7	D	3	13.9	18.5	1.6	D
14:00-15:00	6	14.4	17.9	1.5	D	4	15.5	17.0	3.2	E
15:00-16:00	6	13.6	19.0	2.2	D	6	14.2	18.1	1.0	D
16:00-17:00	6	12.2	21.1	1.3	D	4	13.4	19.1	1.1	D
17:00-18:00	6	13.3	19.4	2.3	D	6	14.9	17.2	1.0	D
18:00-19:00	6	14.3	18.1	2.5	D	6	14.1	18.3	1.6	D
19:00-20:00	6	12.7	20.4	2.3	D	5	12.4	20.7	1.8	D

FY 2008

	Northbound					Southbound				
			Travel Speed (MPH)					Travel Speed (MPH)		
Time Period	No. Runs	Mean Travel Time (Minutes)	Mean	Standard Deviation	LOS	No. Runs	Mean Travel Time (Minutes)	Mean	Standard Deviation	LOS
13:00-14:00	5	14.6	17.6	1.3	D	5	13.4	19.3	2.1	D
14:00-15:00	6	17.8	14.4	1.0	E	6	13.5	19.0	1.1	D
15:00-16:00	3	17.4	14.8	1.5	E	5	13.4	19.1	1.3	D
16:00-17:00	6	16.9	15.4	2.1	E	5	15.6	16.5	1.0	E
17:00-18:00	5	21.4	12.0	0.9	F	5	16.2	15.9	1.0	E
18:00-19:00	5	20.1	13.2	2.9	E	3	14.8	17.3	0.3	D
19:00-20:00	3	14.8	17.4	1.9	D	4	14.6	17.5	0.8	D

FY 2005

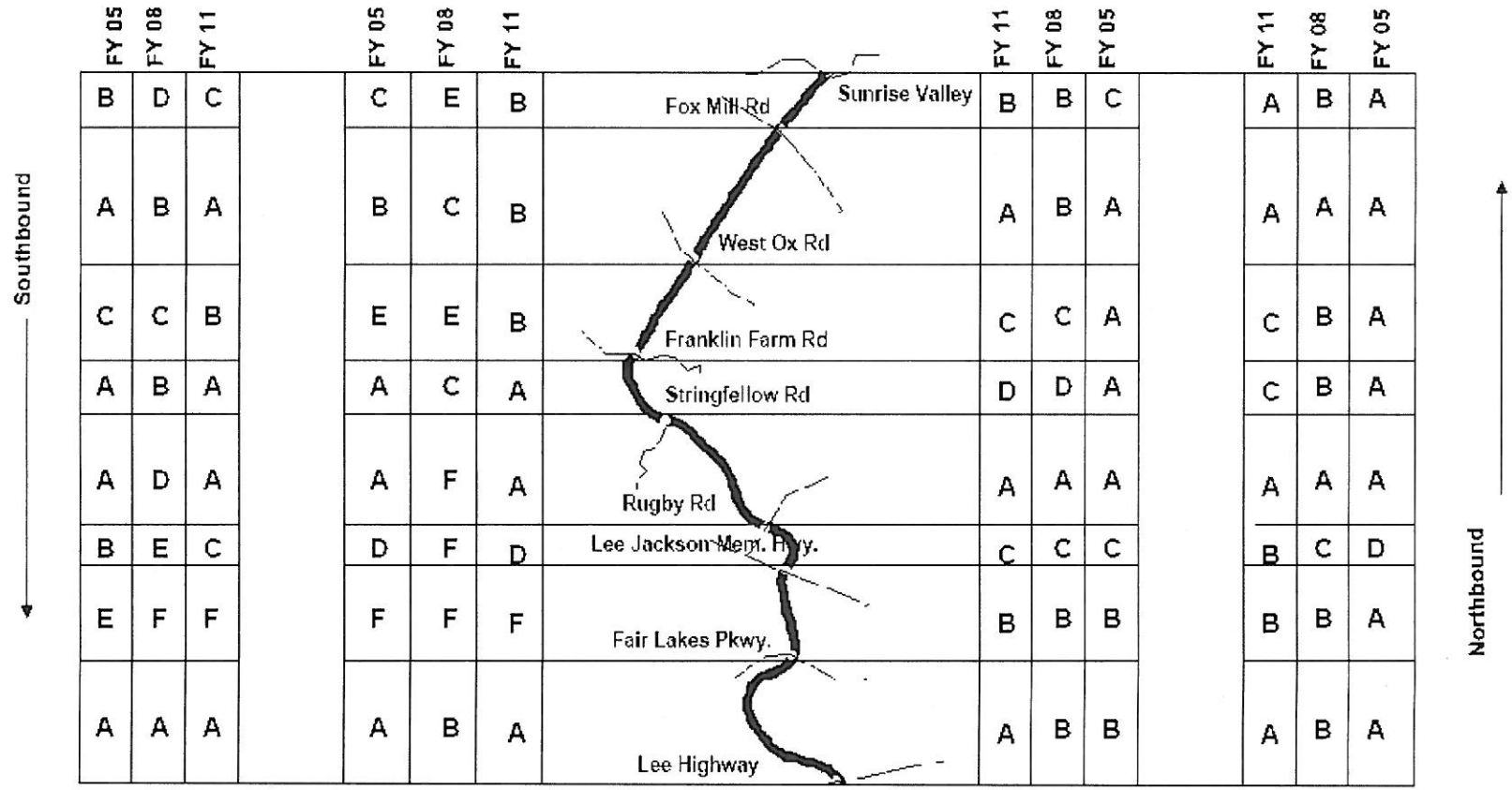
	Northbound					Southbound				
			Travel Speed (MPH)					Travel Speed (MPH)		
Time Period	No. Runs	Mean Travel Time (Minutes)	Mean	Standard Deviation	LOS	No. Runs	Mean Travel Time (Minutes)	Mean	Standard Deviation	LOS
13:00-14:00	4	10.9	23.5	1.2	C	3	11.9	21.5	2.9	D
14:00-15:00	3	10.9	23.5	3.6	C	5	11.9	21.5	3.4	D
15:00-16:00	3	10.9	23.5	6.8	C	3	12.8	20.0	2.1	D
16:00-17:00	7	11.5	22.2	3.0	C	3	11.4	22.4	2.2	C
17:00-18:00	6	14.0	18.3	2.9	D	7	13.4	19.1	1.5	D
18:00-19:00	5	12.0	21.3	3.0	D	8	12.7	20.1	2.6	D
19:00-20:00	3	15.5	16.5	2.0	E	4	10.3	24.8	4.4	C


N
Maryland Route 28 (LOS)
Between Viers Mill Road and New Hampshire Avenue
Segment Length: 9.0 miles
Westbound
PM Peak Period
F A B A D D A FY 05
F A B B D C A FY 08
E A B A D D A FY 11
PM Peak Hour
A B A D C A A FY 05
E B B B E C A FY 08
F A A A E D A FY 11
Viers Mill Rd.
Baltimore Road
Gude Drive
Bel Pre
Muncaster
Georgia Avenue
Layhill Road
New Hampshire Ave.
B A B F F E B FY 11
PM Peak Hour
D C E C F C B FY 08
F F E C F B B FY 05
PM Peak Period
B A B E F E B FY 11
C B D B F C B FY 08
D D D B F B B FY 05
Eastbound

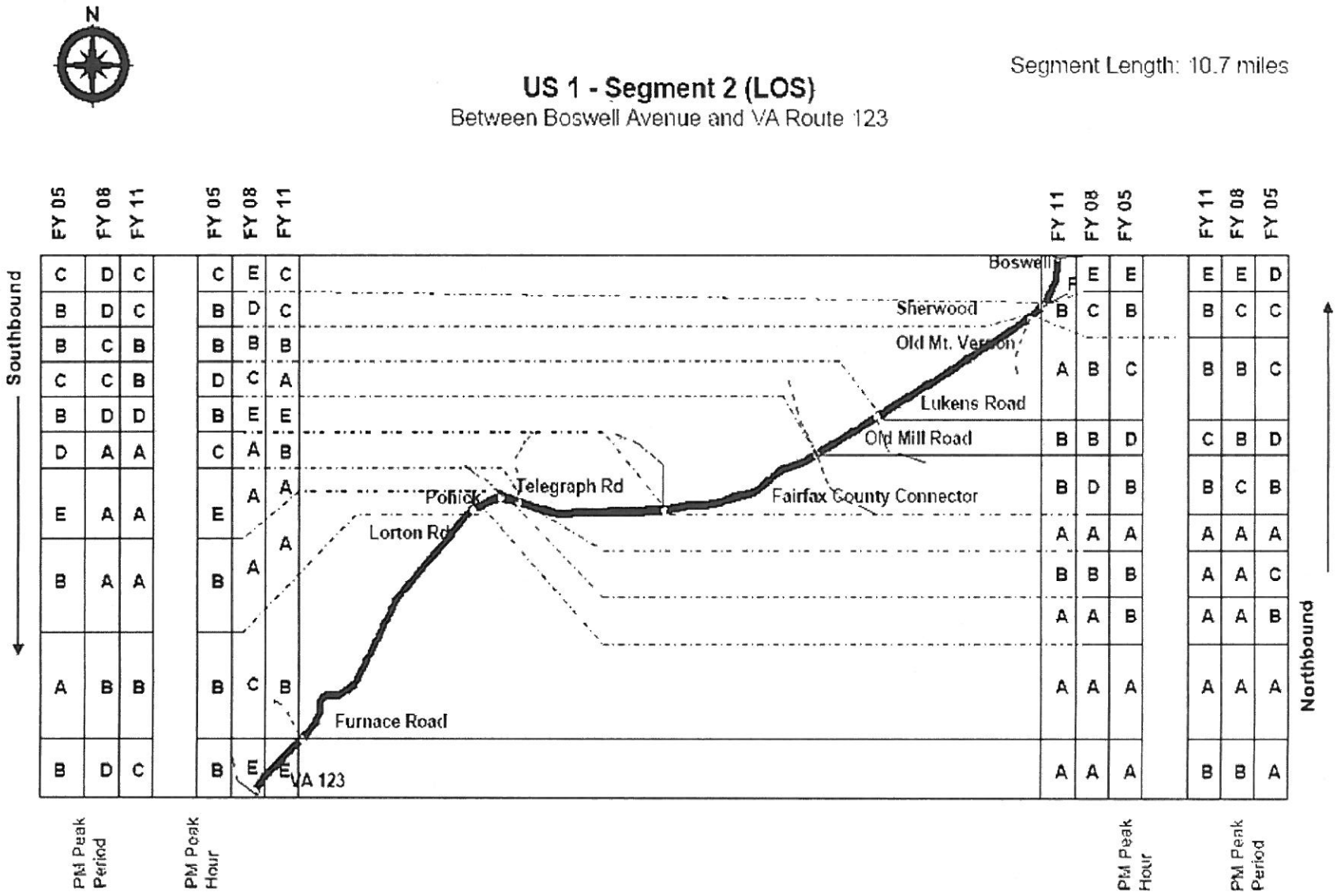
Fairfax County Parkway - Segment 1 (LOS)

Between Sunrise Valley Road and Lee Hwy

Segment Length: 7.2 miles



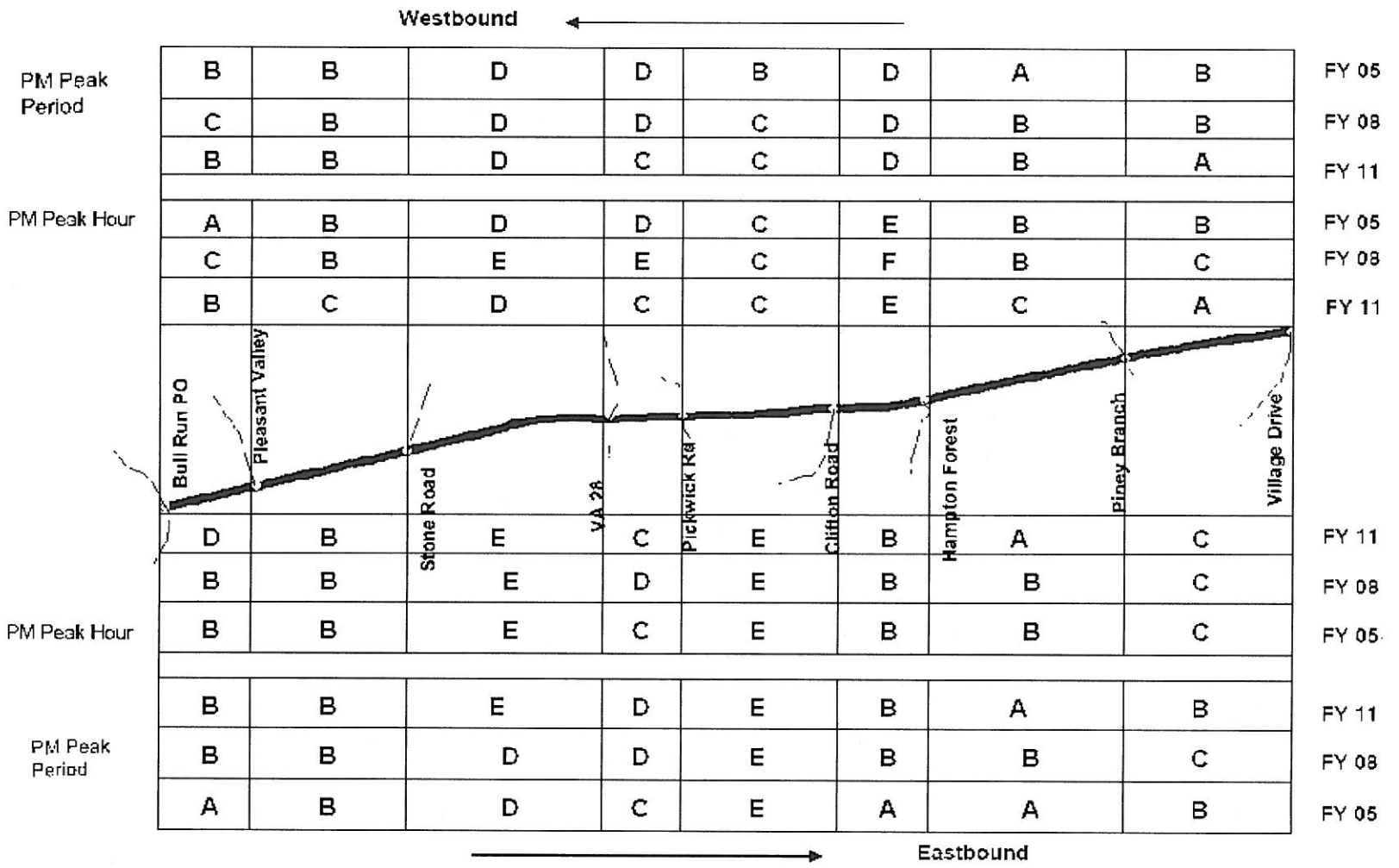
FY 05	FY 08	FY 11	FY 05	FY 08	FY 11		FY 11	FY 08	FY 05	FY 11	FY 08	FY 05
B	D	C	C	E	B	Sunrise Valley / Fox Mill Rd	B	B	C	A	B	A
A	B	A	B	C	B	West Ox Rd	A	B	A	A	A	A
C	C	B	E	E	B	Franklin Farm Rd	C	C	A	C	B	A
A	B	A	A	C	A	Stringfellow Rd	D	D	A	C	B	A
A	D	A	A	F	A	Rugby Rd	A	A	A	A	A	A
B	E	C	D	F	D	Lee Jackson Mem. Hwy.	C	C	C	B	C	D
E	F	F	F	F	F	Fair Lakes Pkwy.	B	B	B	B	B	A
A	A	A	A	B	A	Lee Highway	A	B	B	A	B	A
PM Peak Period			PM Peak Hour				PM Peak Hour			PM Peak Period		


N
US 1 - Segment 2 (LOS)
Between Boswell Avenue and VA Route 123
Segment Length: 10.7 miles
Southbound
Northbound
FY 05
FY 08
FY 11
PM Peak Period
PM Peak Hour
Boswell
Sherwood
Old Mt. Vernon
Lukens Road
Old Mill Road
Telegraph Rd
Fairfax County Connector
Pohick
Lorton Rd
Furnace Road
VA 123

US 29 - Segment 3 (LOS)

Between Village Drive and Bull Run Post Office Road

Segment Length: 6.6 miles



PM Peak Period	B	B	D	D	B	D	A	B	FY 05
	C	B	D	D	C	D	B	B	FY 08
	B	B	D	C	C	D	B	A	FY 11
PM Peak Hour	A	B	D	D	C	E	B	B	FY 05
	C	B	E	E	C	F	B	C	FY 08
	B	C	D	C	C	E	C	A	FY 11
	D	B	E	C	E	B	A	C	FY 11
	B	B	E	D	E	B	B	C	FY 08
PM Peak Hour	B	B	E	C	E	B	B	C	FY 05
	B	B	E	D	E	B	A	B	FY 11
PM Peak Period	B	B	D	D	E	B	B	C	FY 08
	A	B	D	C	E	A	A	B	FY 05

Findings:

- 40 percent of the lane miles surveyed were congested during the PM peak hour
- In the District of Columbia the routes surveyed had similar levels of congestion as the 2008 survey with the exception of Pennsylvannia Avenue. K street and Pennsylvania Avenue fail throughout the survey period
- Some routes such as Fairfax County Parkway, US 1 and US 29 is providing better service when compared with the conditions in 2008 and the other routes are operating similar to 2008. US 29 from Park to Village Drive fails throughout the Survey period.
- In Maryland MD 28 is operating worse than in 2008; possibly due to the opening of the 1st segment of Inter County Connector. Other routes remained the same for the most part except MD 97 (Georgia Avenue) inside the beltway had significant improvement in LOS.

Projects in CLRP/TIP That Address Bottlenecks and Congested Corridors

- K-Street Busway; Anacostia Streetcar project
- US 29 Upgrades in Maryland; MD 28/MD198 widening; MD 5 upgrade
- US 29 Upgrades in Virginia; Fairfax County Parkway HOV and Upgrades
- US 1 bus turn lanes in Virginia

Final Arterial Highway Congestion Monitoring Project as currently designed

Future of the Congestion Monitoring Program

- Goal
  - To identify the location, extent, duration of congestion
  - To provide data to other teams within DTP- volume, speed, and vehicle classes
  - Provide support data in the development of the CMP
  - Coverage of Freeways and Arterial highways in both urban and rural settings
  - Coverage of congestion among non-motorized travel such as congestion on bicycle and pedestrian facilities

- Data Sources
  - We collect, purchase data
  - Technology used to collect data

- Issues
  - How often do we collect the data
    - Daily, weekday/weekend, monthly/seasonal variation
  - Extent of data collection coverage
    - Geography, all highways versus sample of highways
  - Quality of the data based on the source of data
  - Cost

Suggestions and ideas regarding future of the program welcome