# Results of the 2011 Freeway Congestion Monitoring Program

MOITS Technical Subcommittee

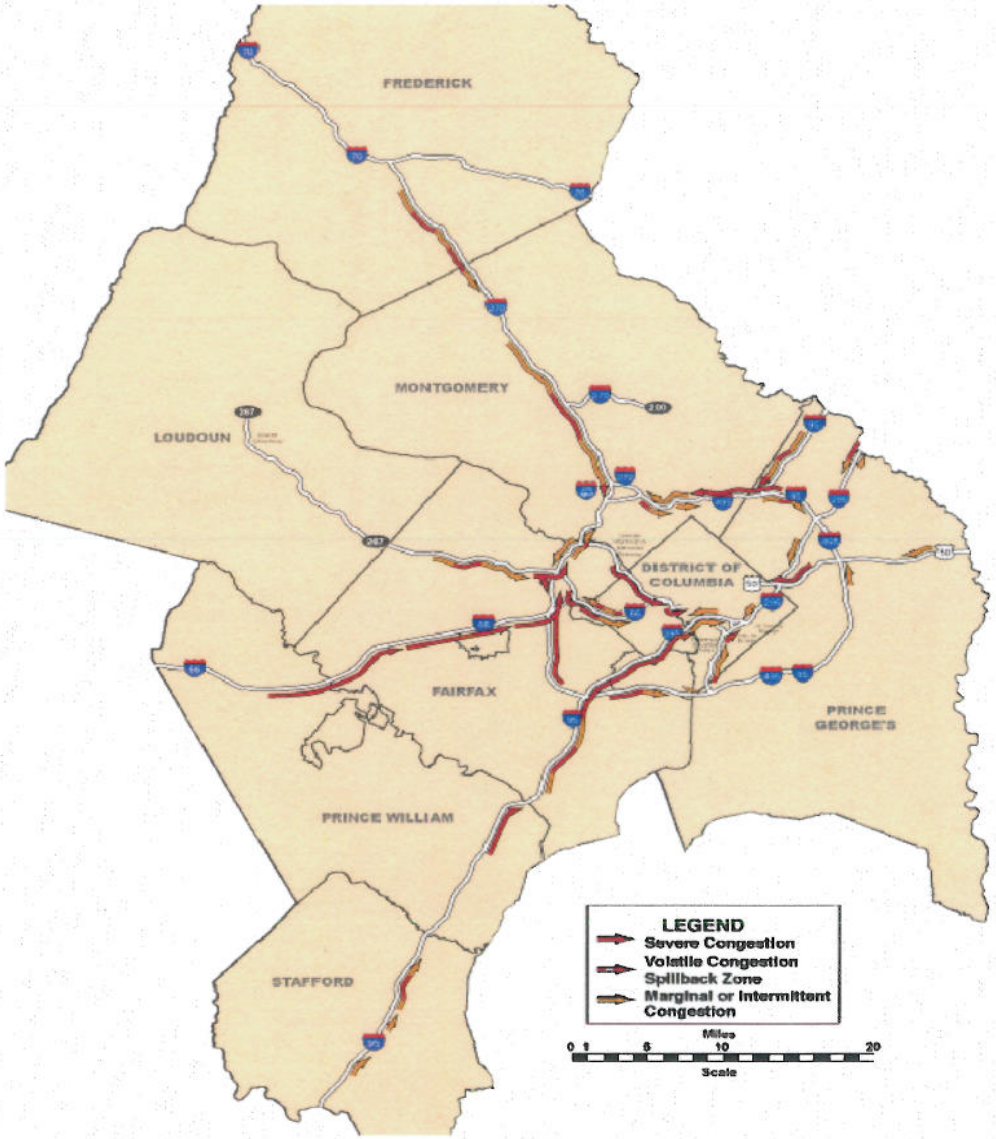
November 8, 2011

Item # 4

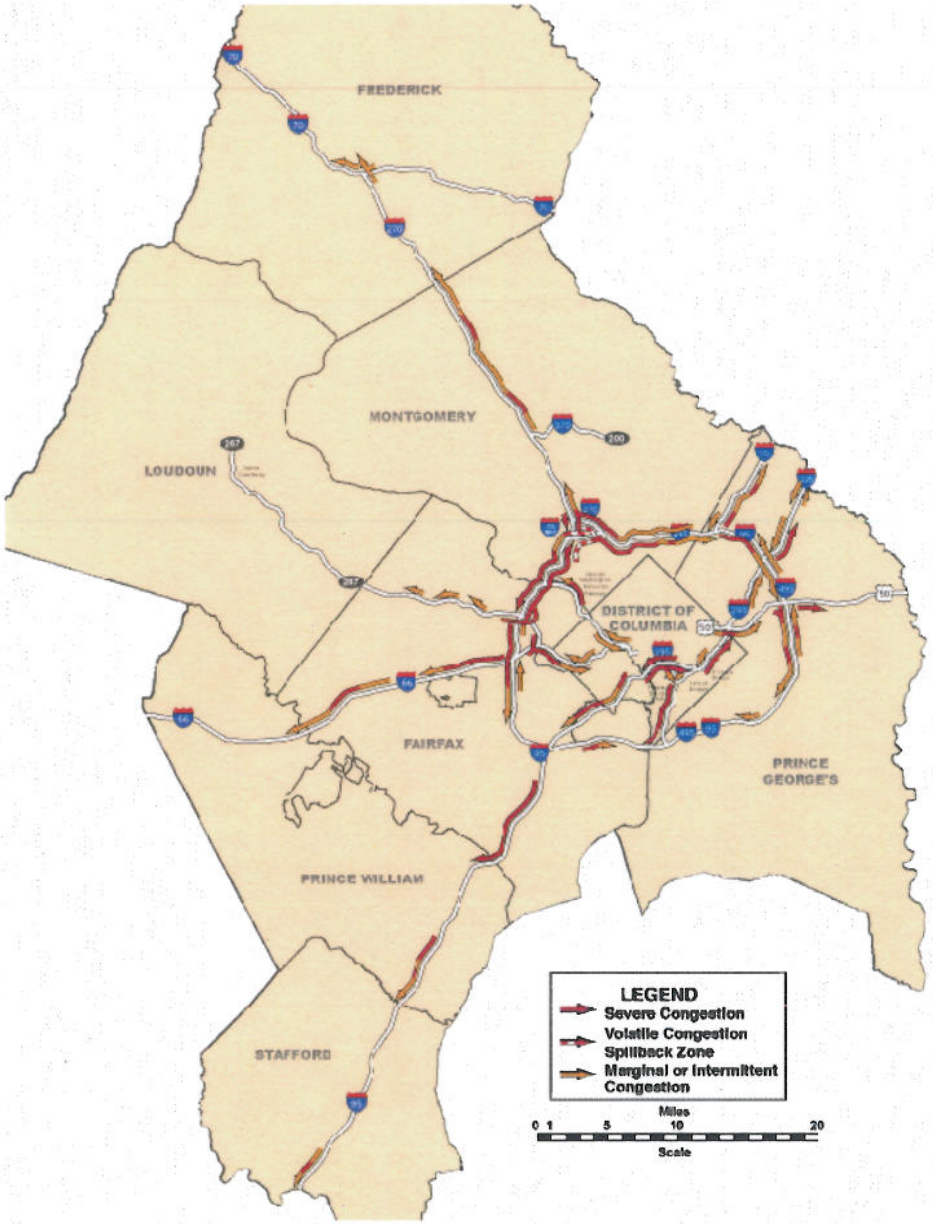
- Background
  - Program in existence since 1993 and repeated every three years
  - Cover 3 hours of AM and PM peak period
  - 4 days of overlapping pictures
  - Vehicles counted and density of the facility calculated
  - Volume and speed estimated using density.
  - Performance depicted as levels of service
  - Performance compared with previous surveys

- Findings
  - "Top Ten" congested locations (bottlenecks) based on density
  - "Top Ten" congested corridors (5 AM and 5 PM) based on travel time
  - Changes to the performance over time whether improvement or degradation
  - Identifying reasons for performance improvement
  - INRIX speed data on freeways

# 2011 AM Peak Period Performance



# 2011 PM Peak Period Performance

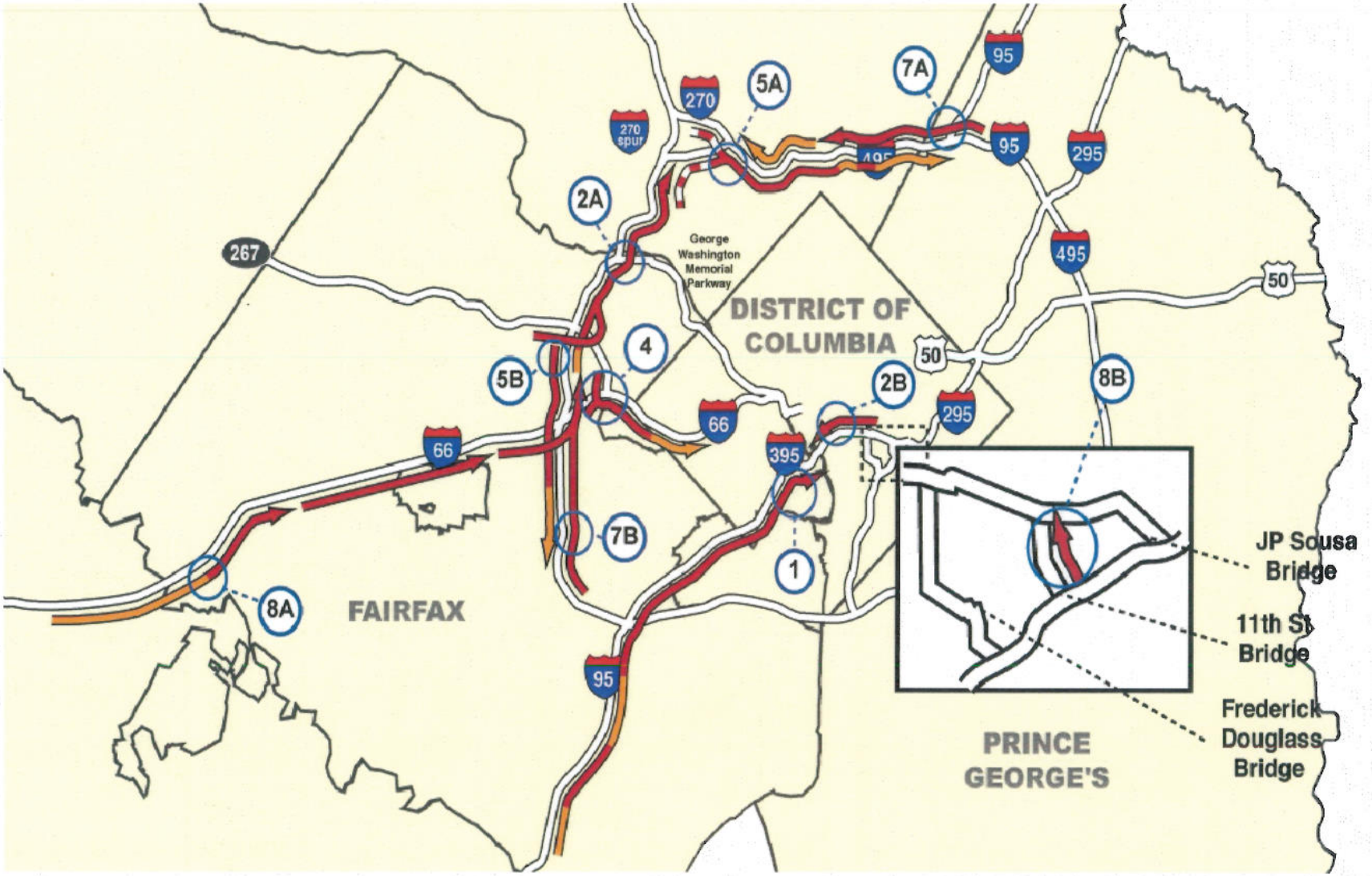


# 2011 Top Ten Bottlenecks

| Rank | Route | From | To | Density | 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 |

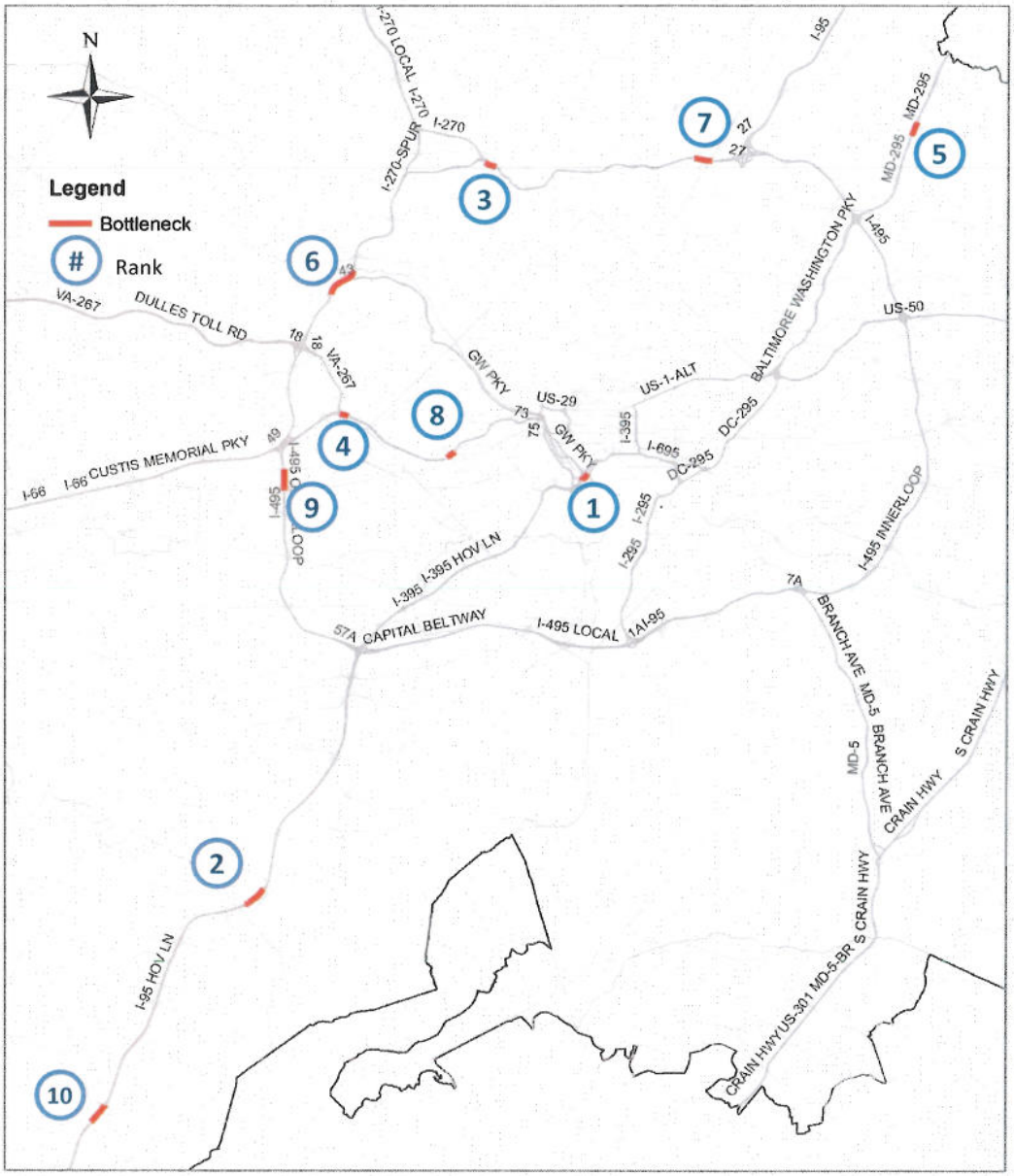
* While impacted by construction, these links are historically congested

# 2011 Top Ten Bottlenecks



# 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 |



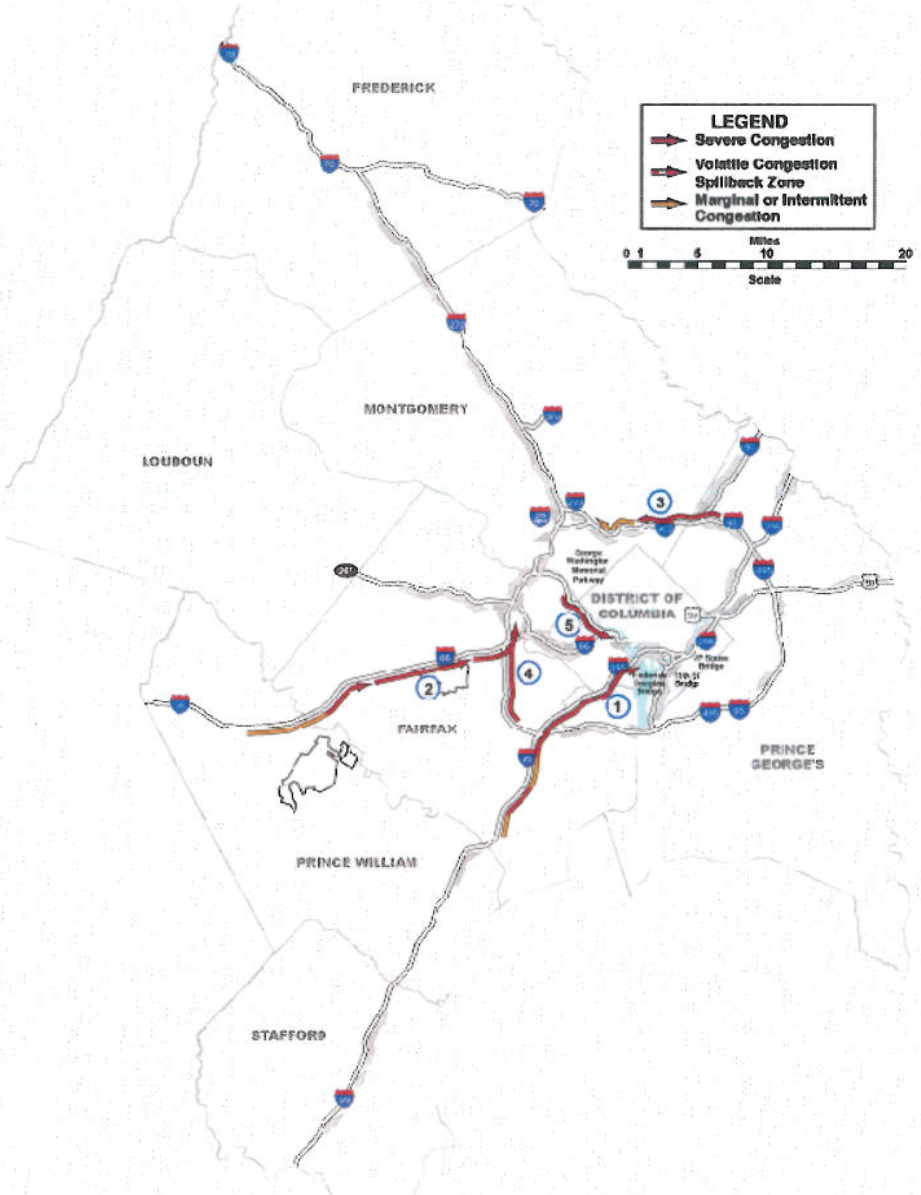
## AM Peak

| 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 |

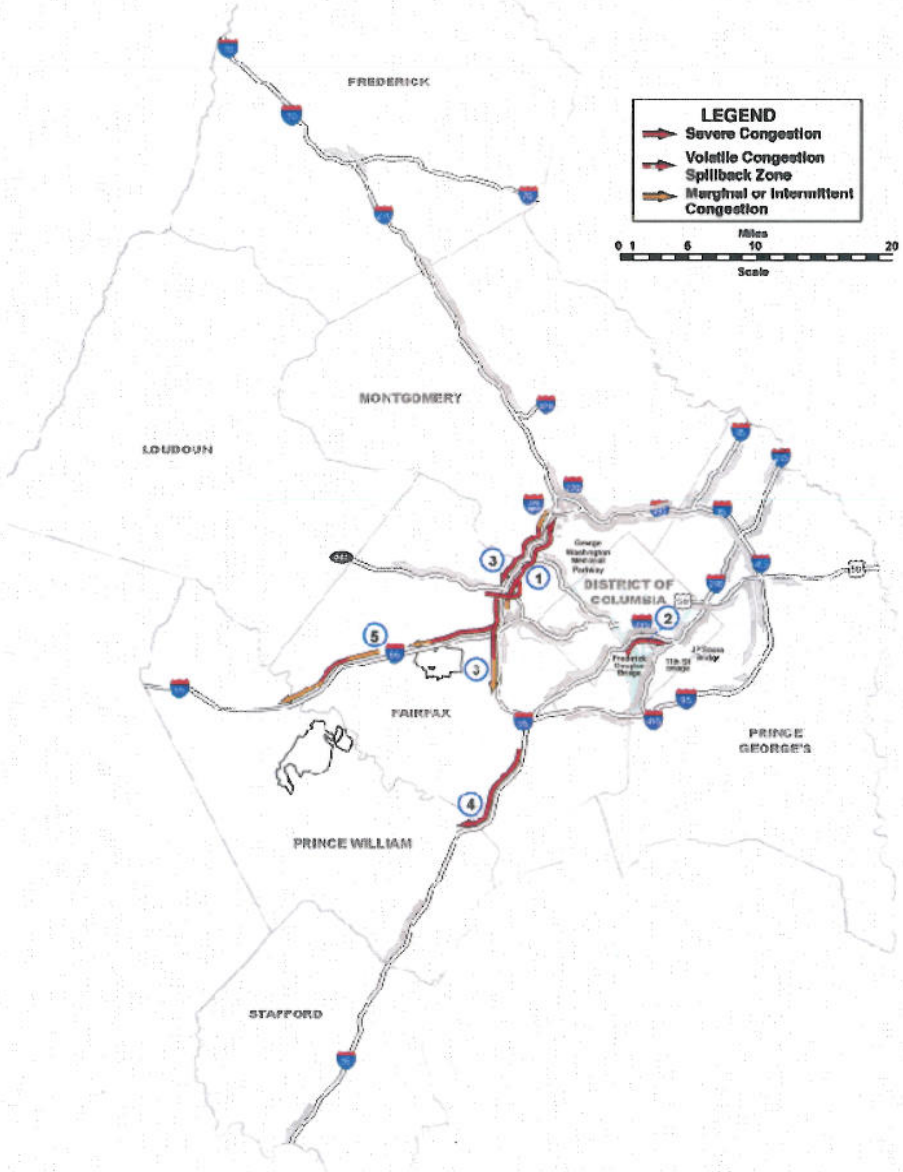
## PM Peak

| 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(Leesburg Pike) | I-270 Spur | 10.3 | 41.8 | 15 | 31.5 |
| Site #2 | I-395 | 5:00 – 6:00 | Northbound | VA 110 (Jeff. Davis Hwy) | Pennsylvania Ave | 4.3 | 19.2 | 13 | 14.9 |
| Site #3 | I-495 | 4:30 – 5:30 | Outerloop | MD 187 (Old Georgetonwn Rd) | VA 236 (Lttle River Turnpike) | 8.8 | 22.6 | 23 | 13.8 |
| Site #4 | I-95 | 4:30 – 5:30 | Southbound | I-495 | VA 123 (Gordon Blvd) | 9.7 | 22.4 | 26 | 12.8 |
| Site #5 | I-66 | 4:30 – 5:30 | Westbound | I-495 | VA 234 (Sudley Rd) | 16.8 | 28.3 | 36 | 11.5 |

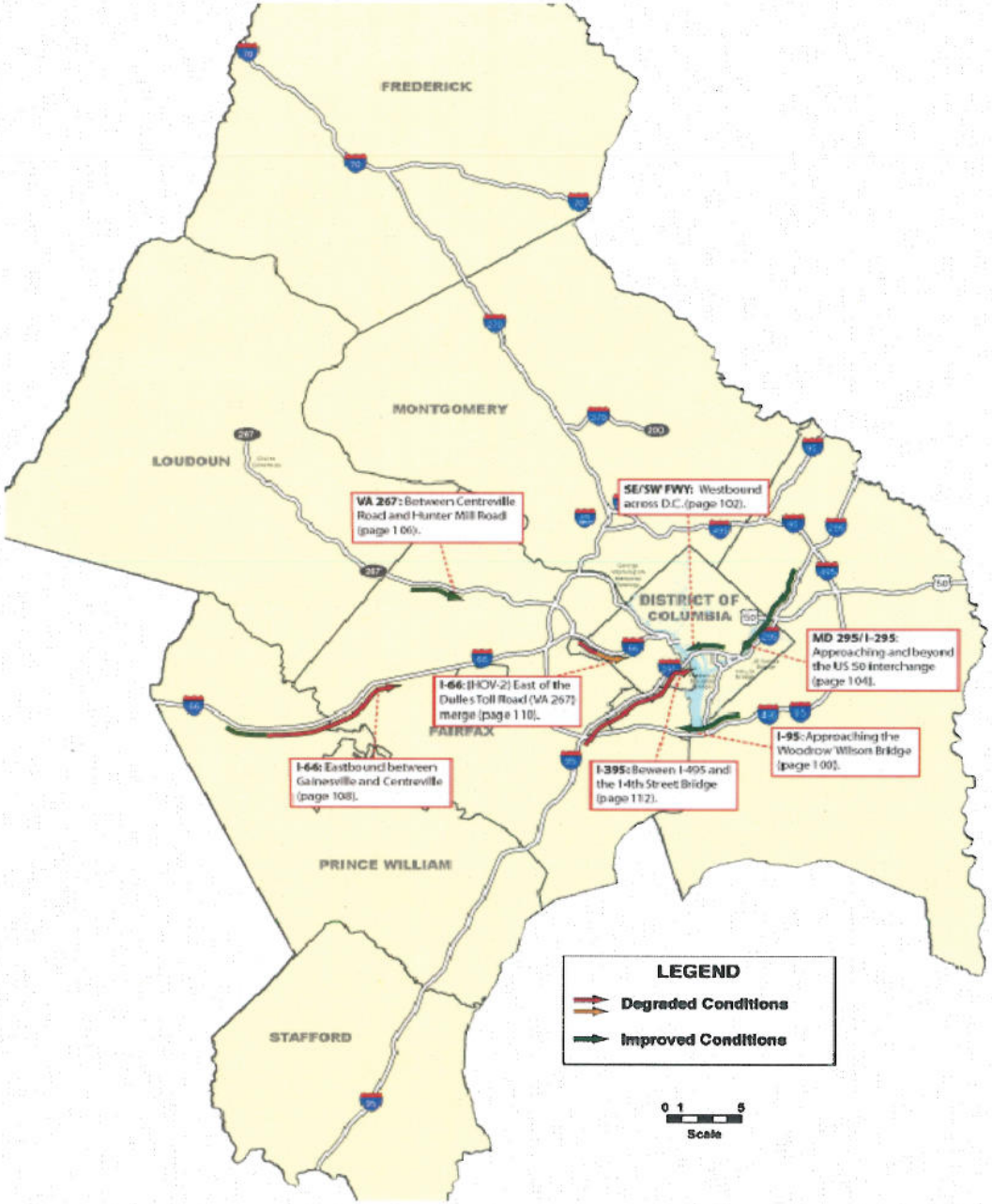
# 2011 AM Longest Delay Corridors



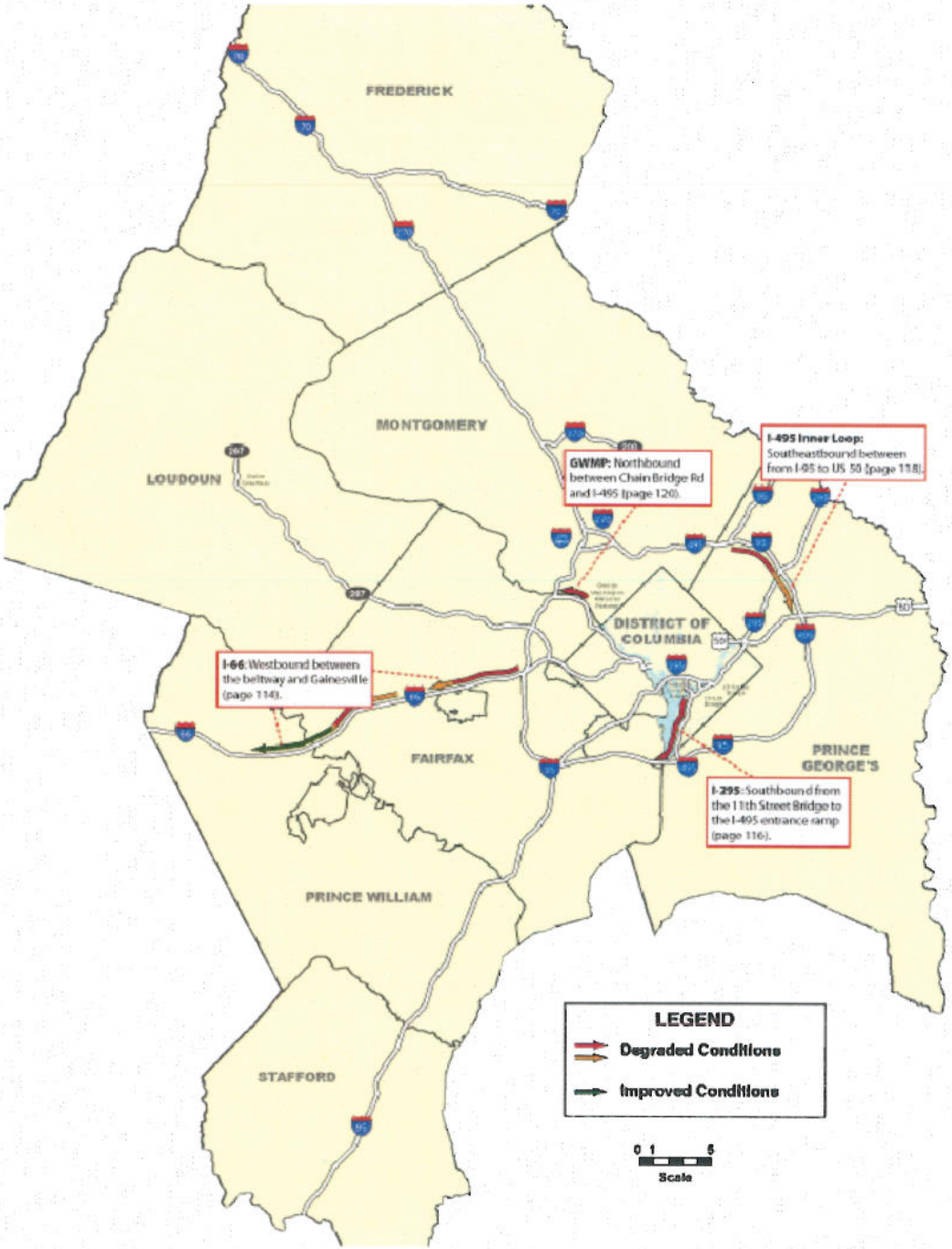
# 2011 PMLongest Delay Corridors



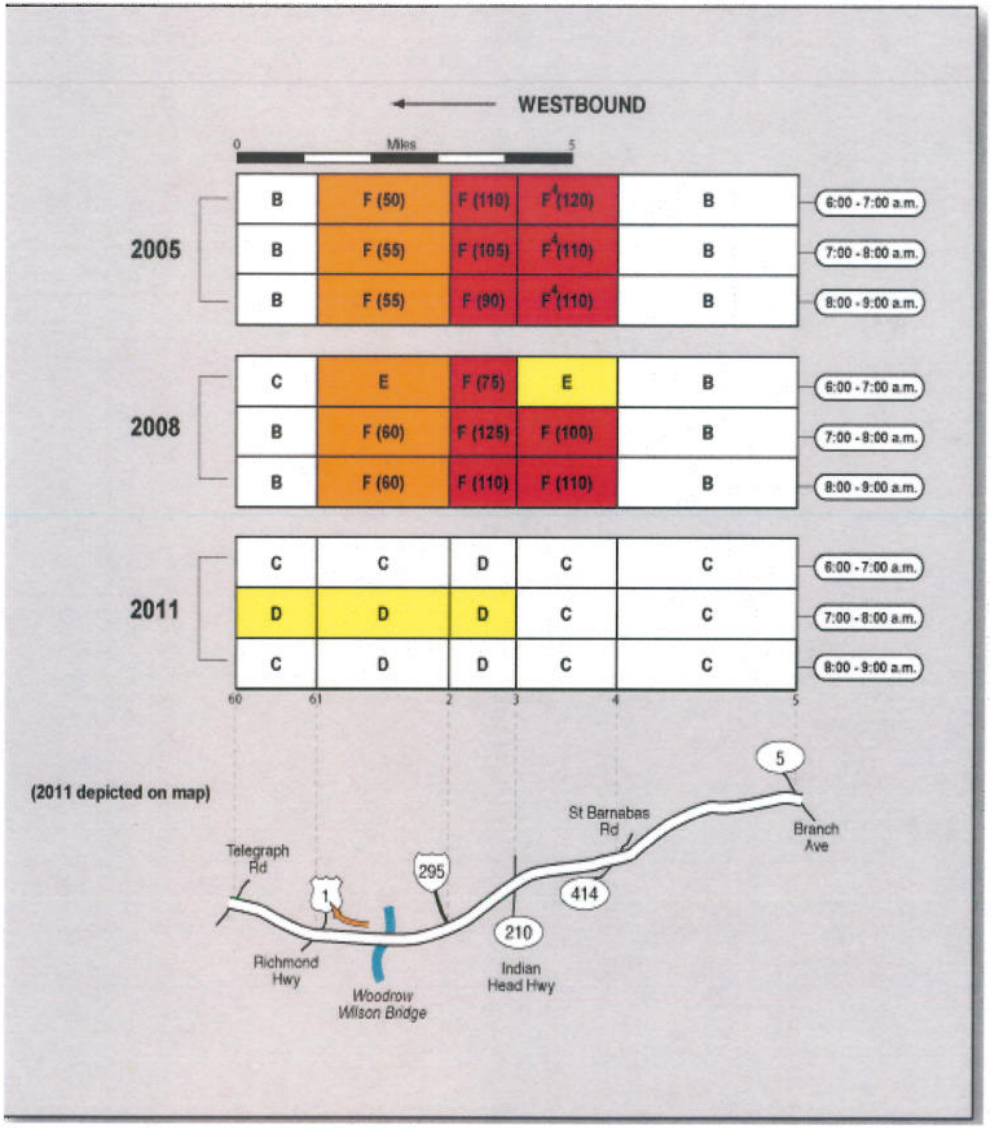
# 2011 Significant Changes AM Peak Period



# 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**

# I-395 Virginia (Arlington County) - Morning

## Photo Set One: 2008

## Photo Set One: 2011

## Photo Set Two: 2008

**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: 2011

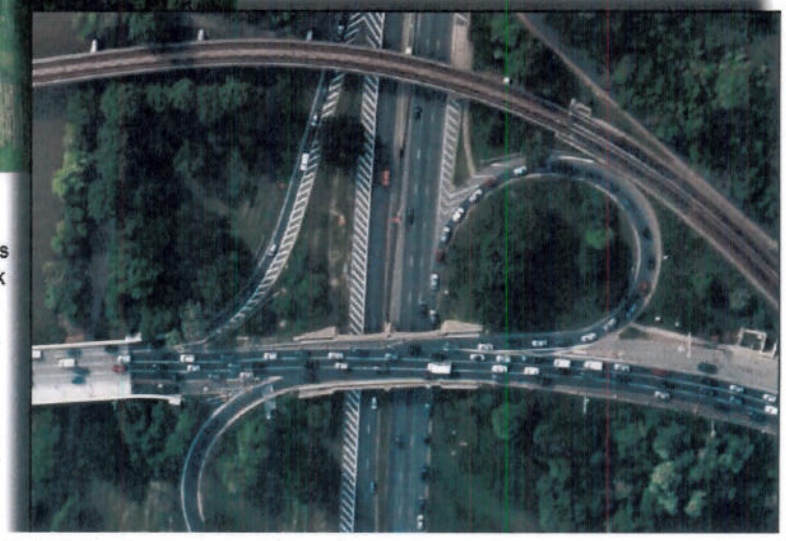
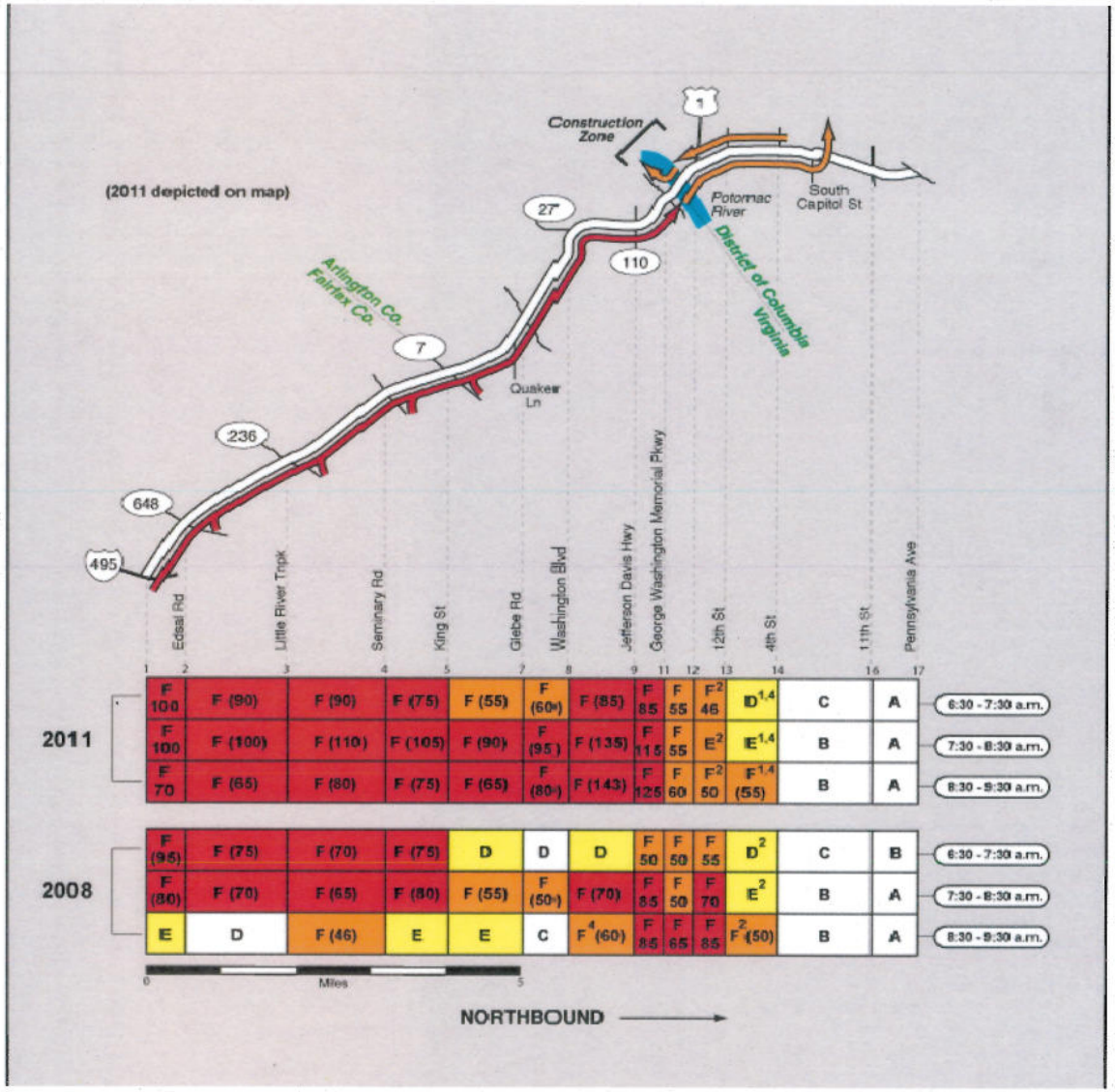


**Photo Set Two (above and right):**
This pair shows the normal configuration of the lanes at the GWP merge in 2008, and then it shows the modifications needed for the rehabilitation work in 2011.

# Changes to I-395 high demand



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

**Photo Set One: 2005**

**Photo Set One: 2011**

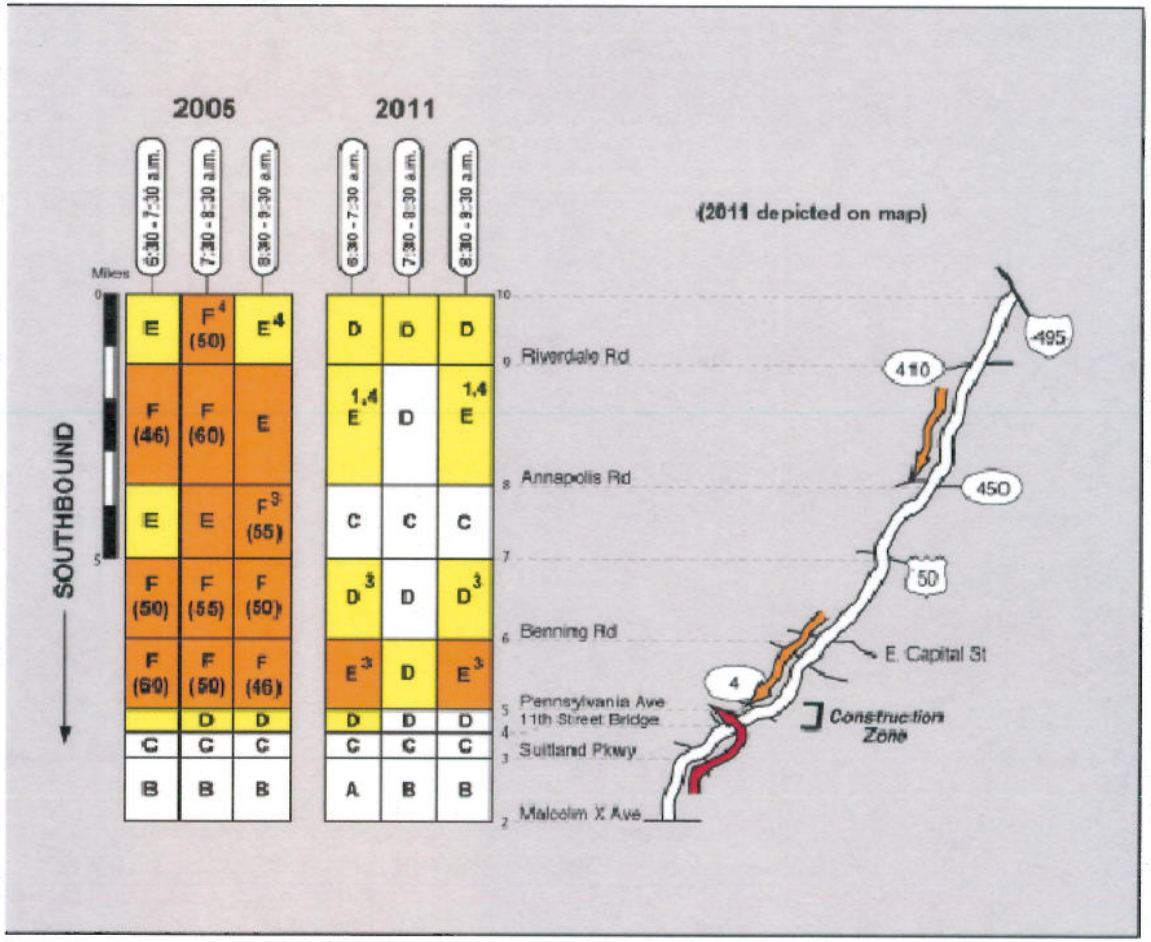
**Photo Set One:** This pair of photographs show the reconfiguration of the Nannie Helen Burroughs Ave NE interchange between 2005 and 2011. Note the lengthened deceleration lane to the right side of the 2011 image.

**Photo Set Two: 2005**

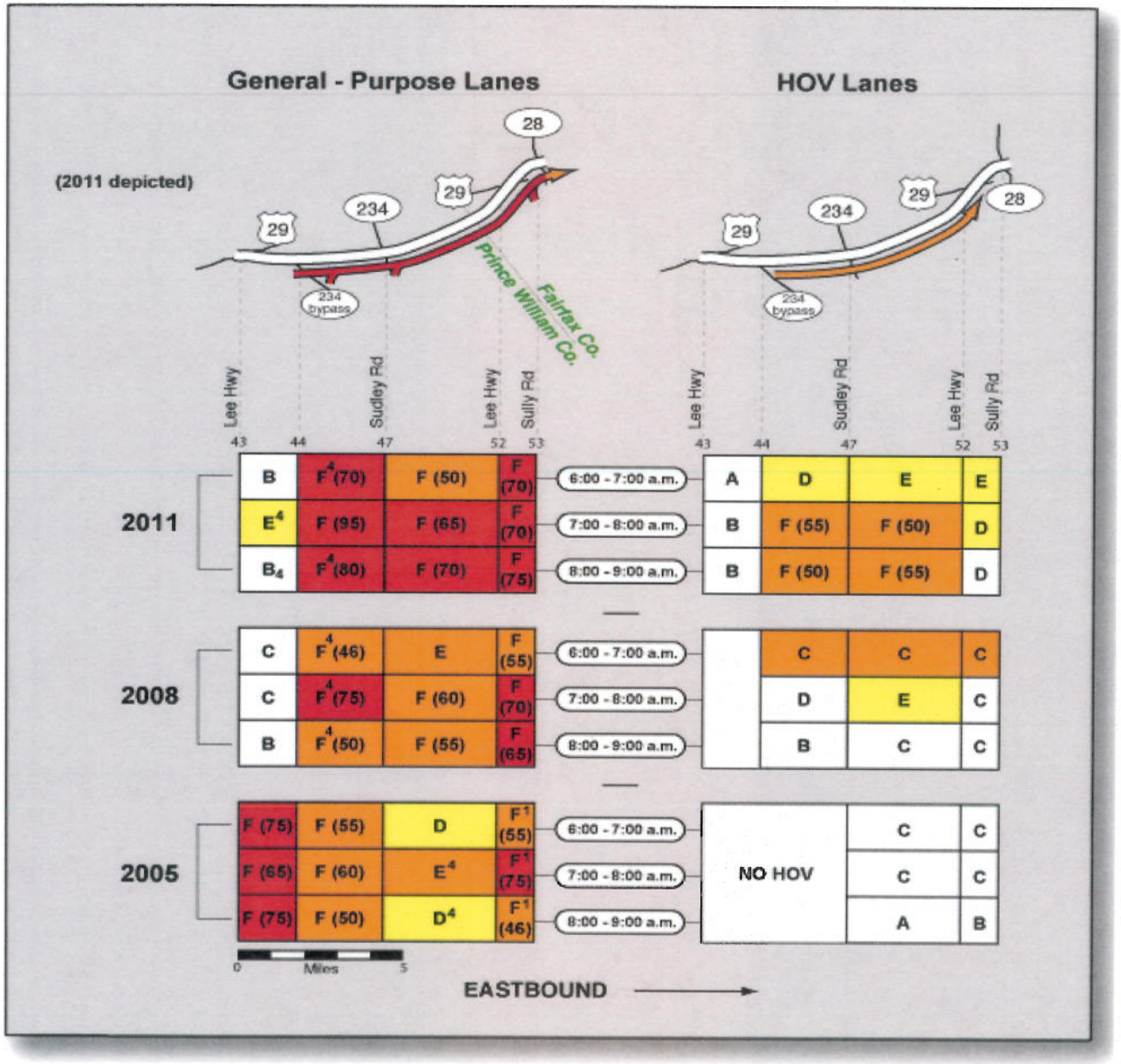
**Photo Set Two:** These photographs show the 2005 (top) and 2011 (bottom) configuration of the DC 295 bridge across the Northeast Corridor railroad right-of-way; note the absence of a significant merge lane in the 2005 photograph, and the friction that caused for southbound traffic on DC 295.

**Photo Set Two: 2011**

# Changes to I-295



# 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)
E4
F (95)
F (65)
F (70)
B4
F4 (80)
F (70)
F (75)
6:00 - 7:00 a.m.
7:00 - 8:00 a.m.
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)
C
F4 (75)
F (60)
F (70)
B
F4 (50)
F (55)
F (65)
C
C
C
D
E
C
B
C
C
2005
F (75)
F (55)
D
F1 (55)
F (65)
F (60)
E4
F1 (75)
F (75)
F (50)
D4
F1 (46)
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

# 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