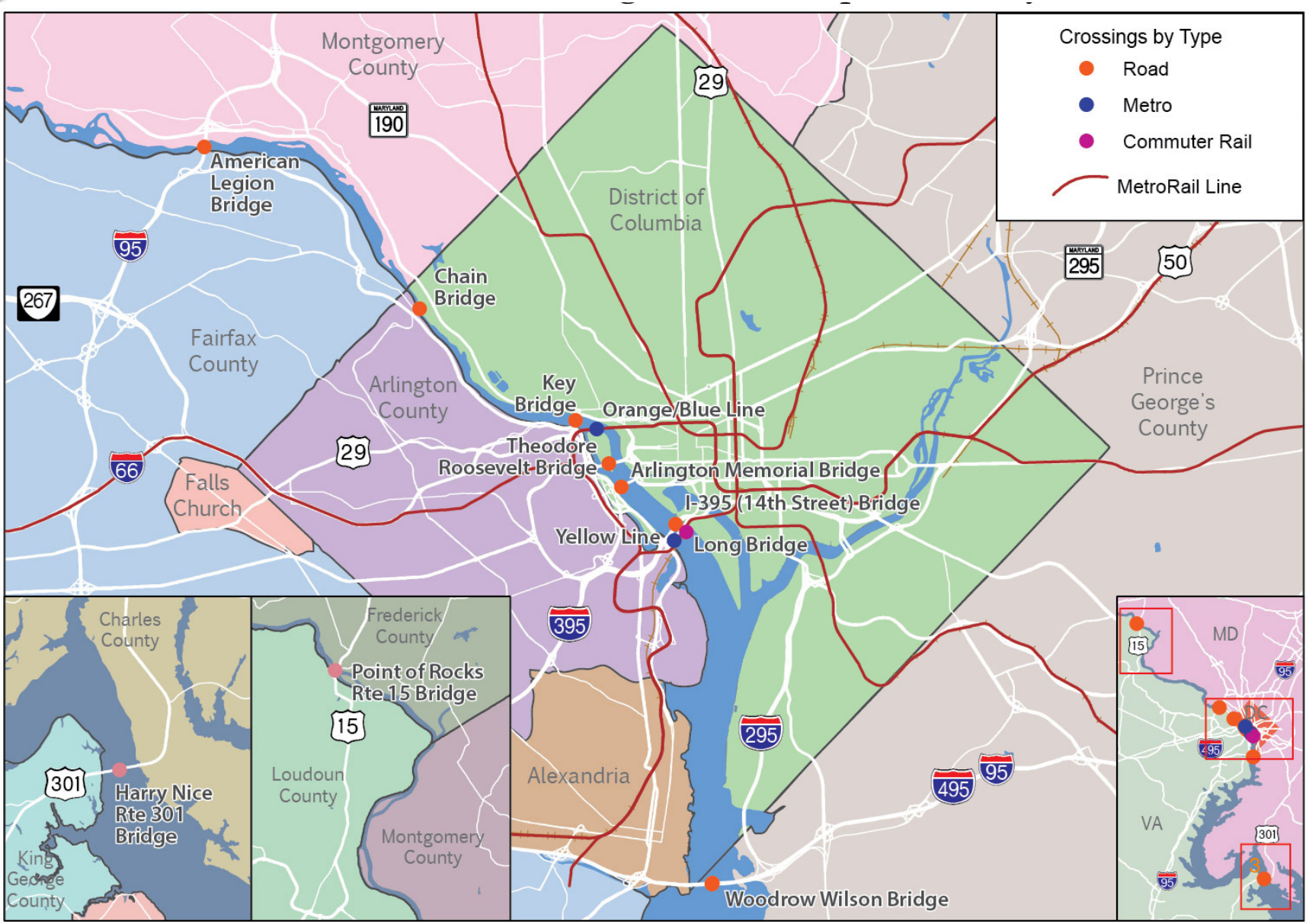
Potomac River Crossing Conditions Study

Deputy Secretary Donohue
July 15, 2015

Study Background and Purpose

- Initiated in 2013 to examine 11 Potomac River crossings from Point of Rocks to Route 301 Nice Bridge
  - Examine current and projected 2040 volumes
  - Examine origin and destination travel patterns
  - Examine current speeds on crossing
- Purpose of study was to identify problems, not identify solutions

Study Area and Crossings

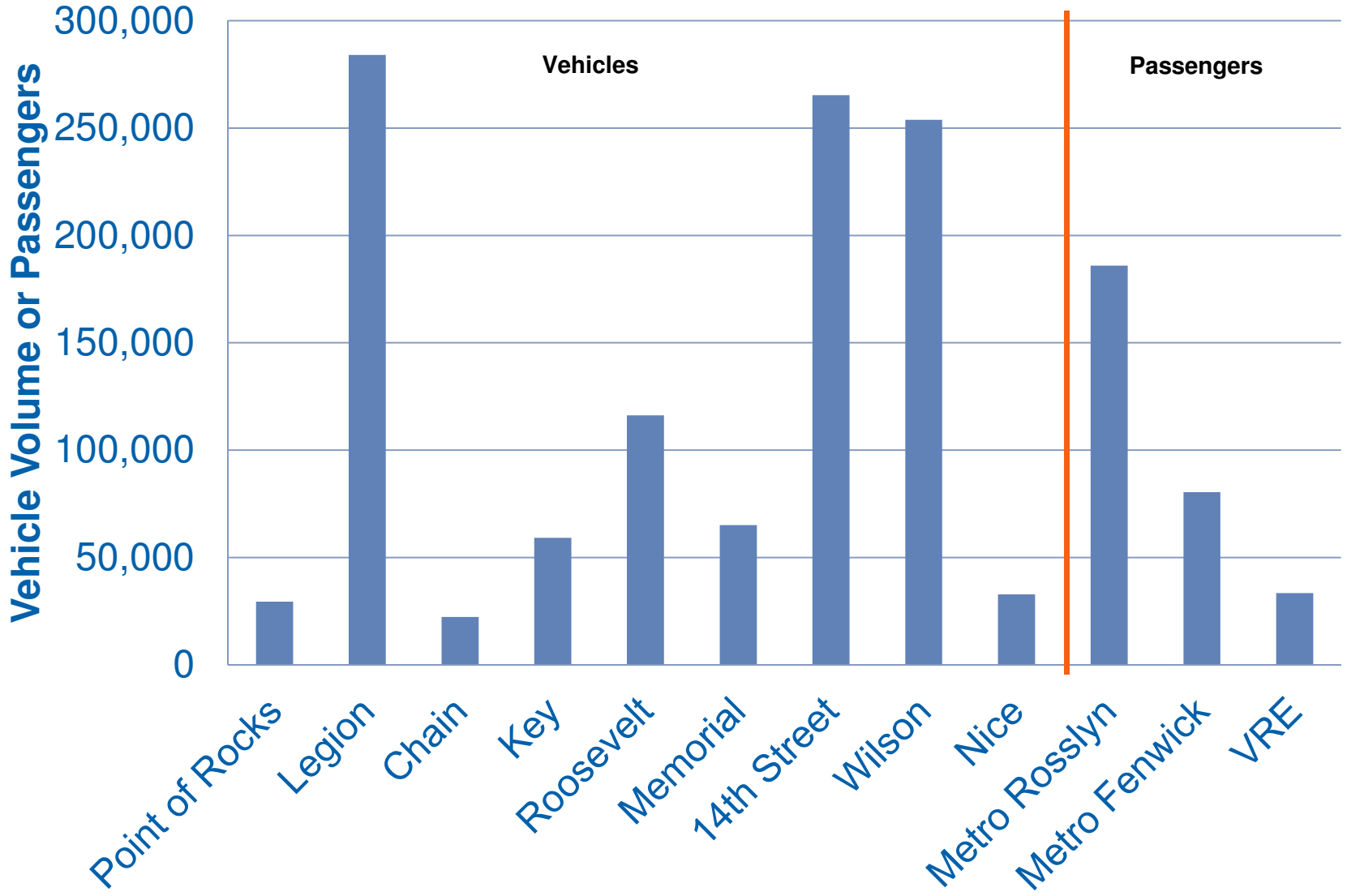


DATA SOURCES

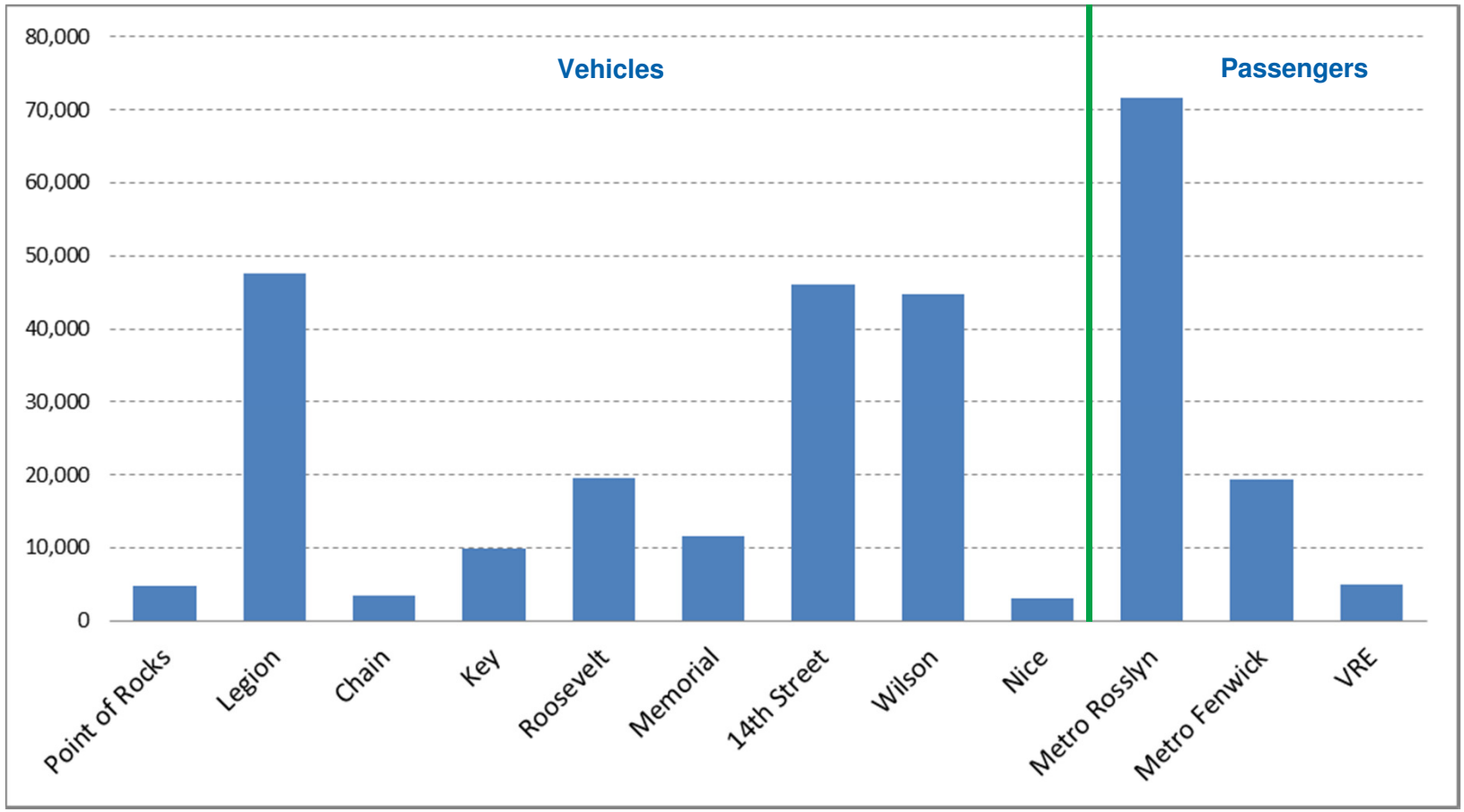
- Volume data taken from existing VDOT/MDOT/DDOT sources if less than 2 years old or from new counts if recent data unavailable
- Origins and destinations were analyzed using 2012 GPS data for highway crossings and 2012 passenger surveys for WMATA
- Travel speeds collected from 2012 GPS data
- Future volume projections from official MWCOG travel demand model

Daily River Crossings

(Highway Volumes, Transit Passengers)



A.M. Peak Period Volumes on Crossings
(both directions)

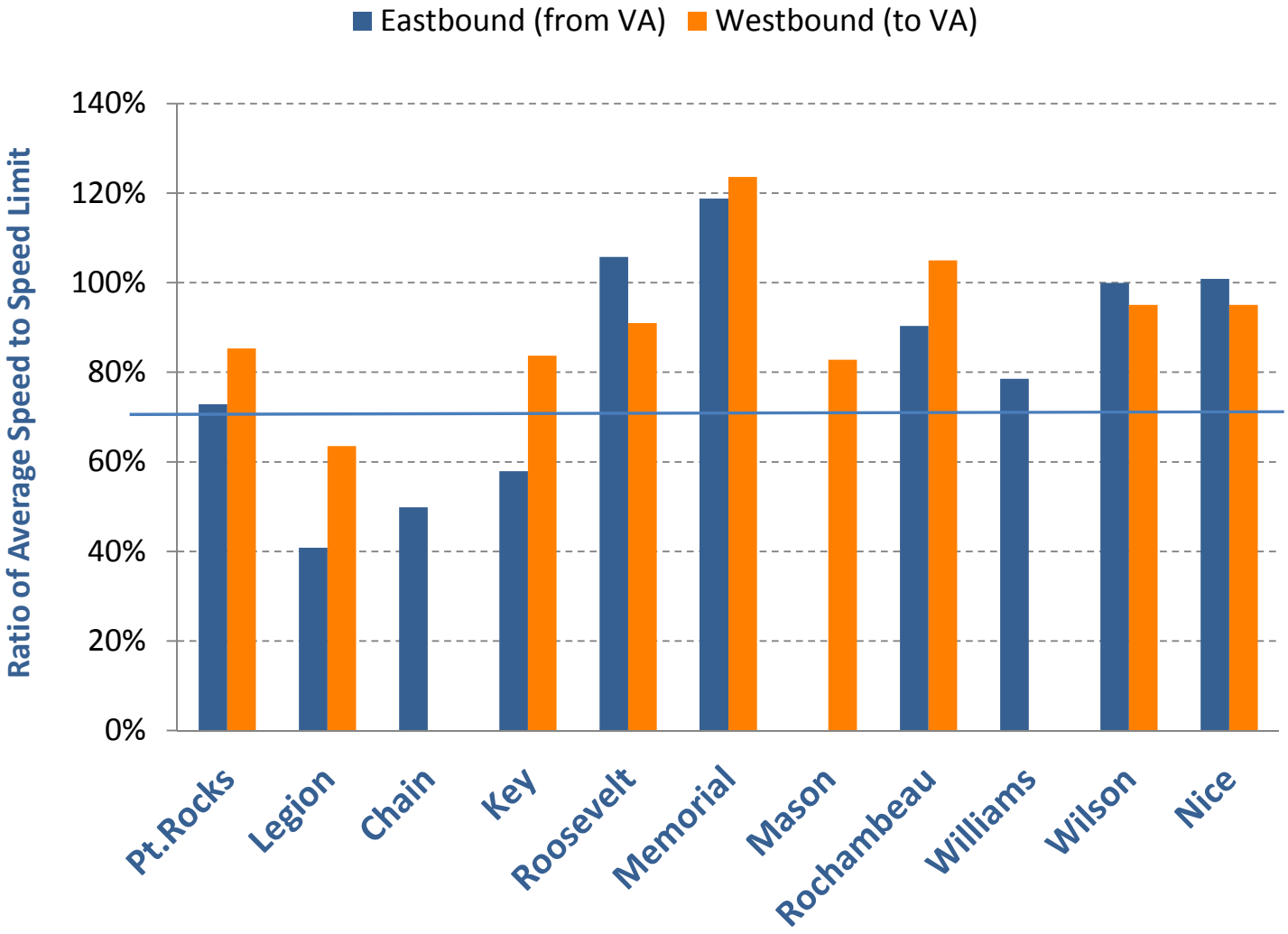


A.M. PEAK PERIOD VOLUMES FROM VIRGINIA

CROSSING	VOLUME	% of Total
Point of Rocks Bridge (US 15)	1,690	1.0%
American Legion Memorial Bridge (I-495)	23,250	14.1%
Chain Bridge	2,290	1.4%
Key Bridge (US 29)	5,890	3.6%
Theodore Roosevelt Memorial Bridge (I-66)	13,800	8.4%
Arlington Memorial Bridge	8,150	4.9%
14th Street Bridge Complex (I-395)	26,490	16.1%
Woodrow Wilson Bridge (I-95)	19,200	11.7%
Harry Nice Memorial Bridge (US 301)	1,810	1.1%
Metrorail Rosslyn Tunnel (Blue/Orange Lines)	43,400	26.3%
Metrorail Fenwick Bridge (Yellow/Blue Line)	13,900	8.4%
VRE	4,900	3.0%
TOTAL	**164,770**	**100.0%**

Volumes expressed as transit passengers, auto vehicles

Ratio of Average Speed to Speed Limit
P.M. Peak Period (3:00 - 7:00)



District Boundaries for O-D Data

Washington D.C. and VA-MD-WVa

Potomac River Crossing Data Development Study

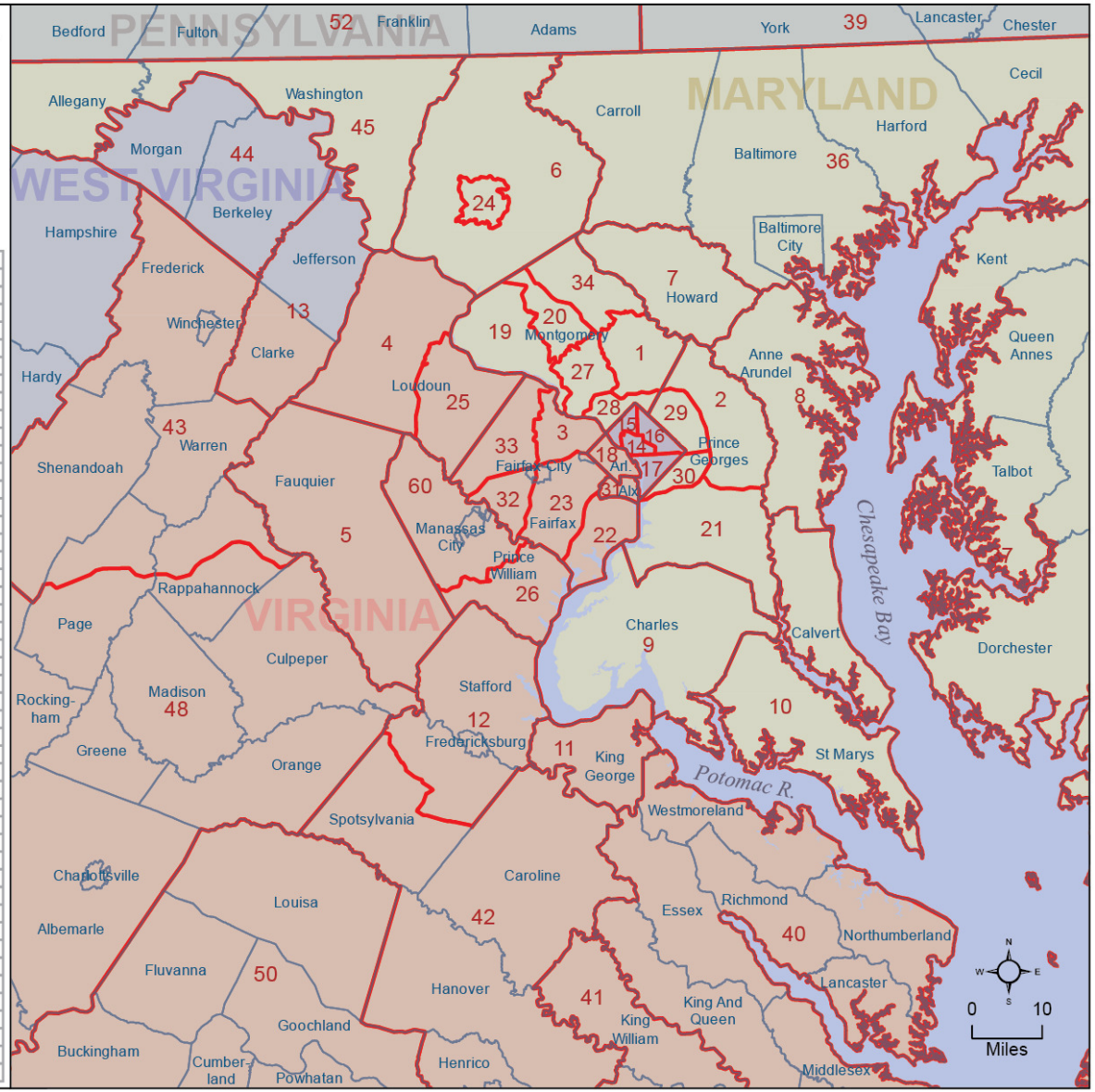
Districts

County Boundaries

Districts Boundaries

Combined Boundaries

District #	District Label
1	Eastern Montgomery County
2	Northeast Prince George's County
3	Northeast Fairfax County, VA
4	Western Loudoun County, VA
5	Fauquier County. VA
6	Frederick County, MD
7	Howard County, MD
8	Anne Arundel County, MD
9	Charles County, MD
10	Calvert & St. Mary's Counties, MD
11	King George County, VA
12	Fredericksburg Metro Area, VA
13	Jefferson / Clarke Counties, WV & VA
14	Washington DC - Core
15	Washington DC - Northwest
16	Washington DC - Northeast
17	Washington DC - South
18	Arlington County, VA
19	Western Montgomery County
20	West-central Montgomery Co (I-270)
21	Southern Prince George's County
22	Fairfax County E of I-95
23	Southeast Fairfax County - W of I-95
24	City of Frederick, MD
25	Eastern Loudoun County
26	Southern Prince William County
27	South-central Montgomery Co (I-270)
28	Close-in Montgomery County
29	Prince George's County (North) - Inside Beltway
30	Prince George's County (South) - Inside Beltway
31	City of Alexandria
32	Southwest Fairfax County
33	Northwest Fairfax County
34	Northern Montgomery County
36	City of Baltimore & northern counties
39	New Jersey and eastern PA
40	Virginia Northern Neck Counties
41	Virginia Pennisula Counties
42	Southern I-95 corridor in Virginia
43	Northern Shenandoah Valley, VA
44	Berkeley / Morgan Counties, WV
45	Western Panhandle, MD
48	NW Virginia & West Virginia
50	South central Virginia
52	Western PA, Ohio, Indiana
60	Northern Prince William County

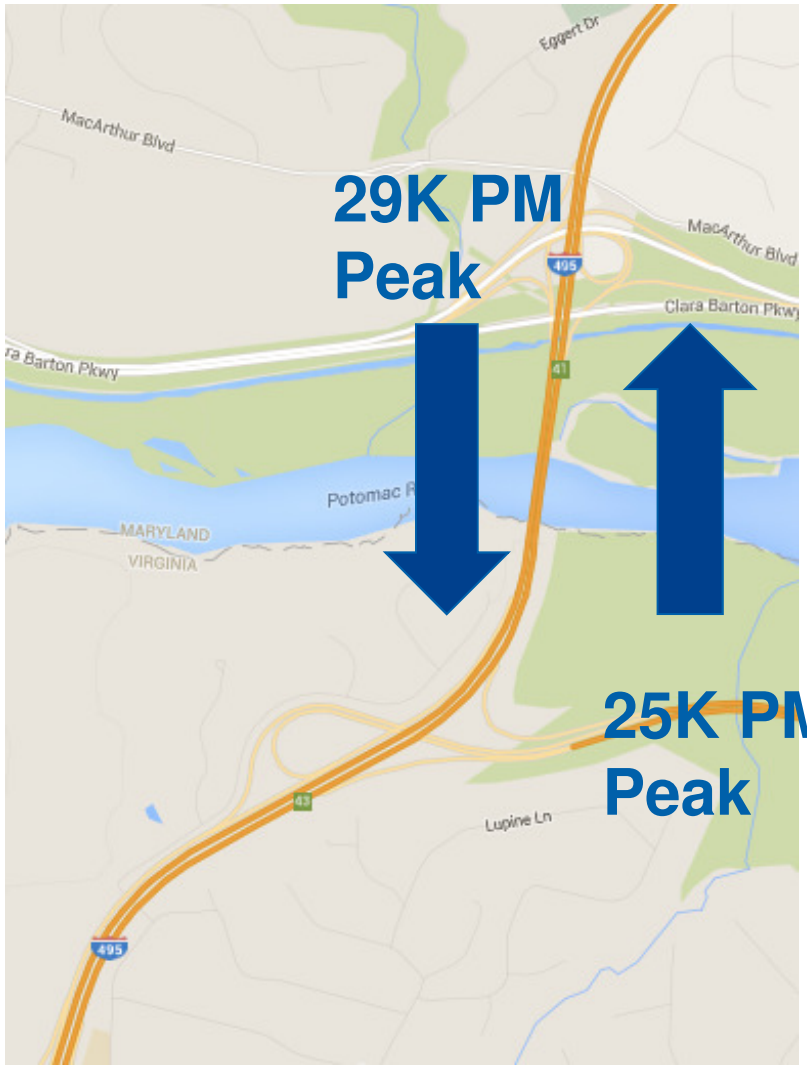


AMERICAN LEGION BRIDGE
VOLUME AND SPEED

SPEED (existing)

	Outer Loop		
	Weekday AM Peak	Weekday PM Peak:	Weekend: Sat/Sun,
Speed (mph)	49.4	**34.9**	57.2
% of Speed Limit	90%	**64%**	104%

	Inner Loop		
	Weekday AM Peak	Weekday PM Peak:	Weekend: Sat/Sun,
Speed (mph)	49.9	**22.5**	56.7
% of Speed Limit	91%	**41%**	103%



AMERICAN LEGION BRIDGE PATTERNS (PM PEAK, INNER LOOP)

Existing (data)

Major Origins	Major Destinations	Major Origin-Destination Pairs	Other Major O-Ds for Combined Districts
Central Fairfax County (30%)	Eastern Montgomery County (44%)	Central Fairfax County to Eastern Montgomery County (14%)	Central Fairfax to Western Montgomery, Frederick, & Points Northwest (8%)
Western Fairfax County (21%)	Western Montgomery County (19%)	Western Fairfax County to Eastern Montgomery County (10%)	Eastern Loudoun & Western Fairfax to Western Montgomery, Frederick, & Points Northwest (5%)
Arlington / Alexandria (13%)	Baltimore Metro Area and Points Northeast of the metropolitan Washington region (17%)	Arlington/Alexandria – Eastern Montgomery County (6%)	

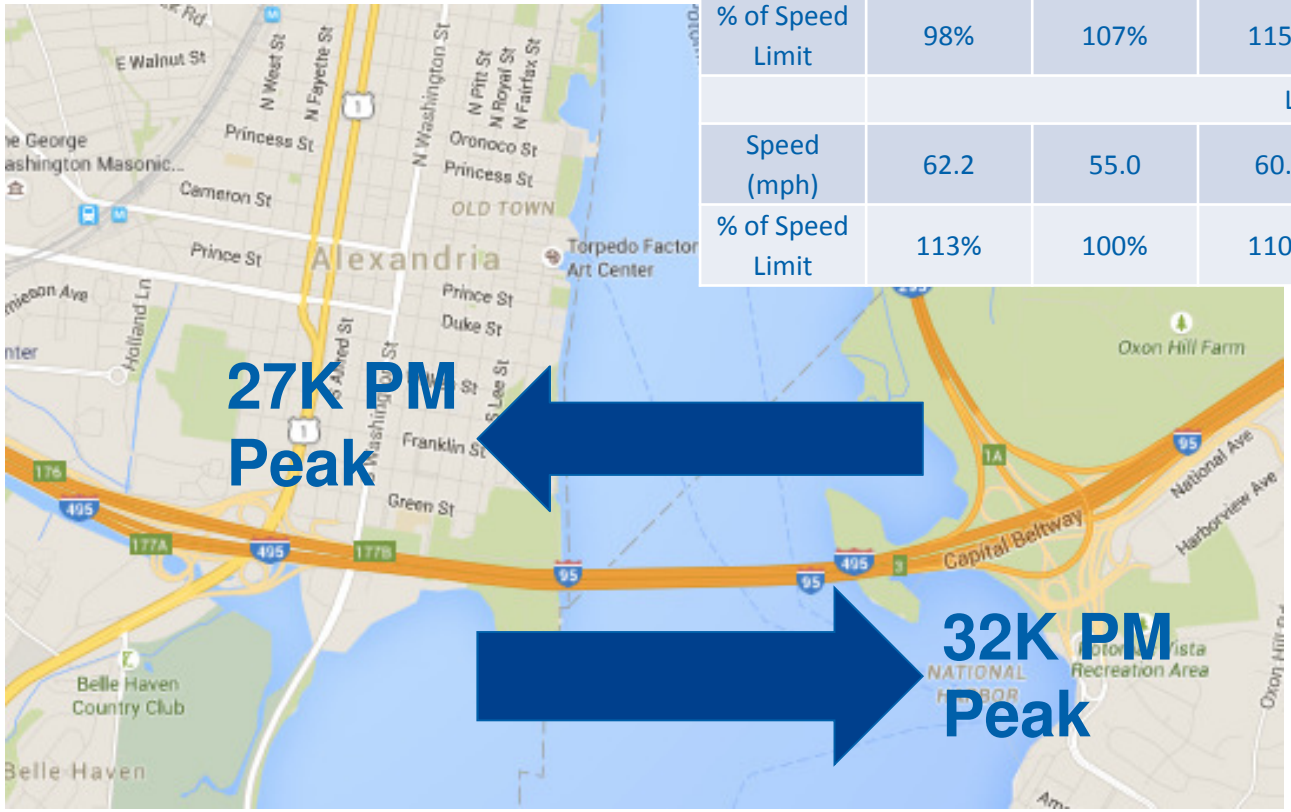
Future (model)

Major Origins	Major Destinations	Major Origin-Destination Pairs	Other Major O-Ds for Combined Districts
Central Fairfax County (48%)	Eastern Montgomery County (32%)	Central Fairfax County –to Eastern Montgomery County (15%)	Central Fairfax to Western Montgomery, Frederick, & Points Northwest (12%)
Western Fairfax County (16%)	Western Montgomery County (14%)	Western Fairfax County to Eastern Montgomery County (14%)	Eastern Loudoun & Western Fairfax to Western Montgomery, Frederick, & Points Northwest (4%)
Arlington / Alexandria (13%)	Baltimore Metro Area and Points Northeast of the metropolitan Washington region (29%)	Arlington/Alexandria to Eastern Montgomery County (7%)	

% = portion of traffic on bridge during period and direction shown

WOODROW WILSON BRIDGE
VOLUME AND SPEED

	To VA			From VA		
	Weekday AM Peak	Weekday PM Peak:	Weekend: Sat/Sun,	Weekday AM Peak	Weekday PM Peak:	Weekend: Sat/Sun,
	THROUGH LANES					
Speed (mph)	53.9	59.0	63.3	62.2	55.0	60.4
% of Speed Limit	98%	107%	115%	113%	100%	110%
	LOCAL LANES					
Speed (mph)	62.2	55.0	60.4	57.7	52.3	57.8
% of Speed Limit	113%	100%	110%	105%	95%	105%



WOODROW WILSON BRIDGE PATTERNS (PM PEAK, INNER LOOP)

Existing

Major Origins	Major Destinations	Major Origin-Destination Pairs	Other Major O-Ds for Combined Districts
Eastern Fairfax County (22%)	Points East of the metropolitan DC region (30%)	Points South of the metro DC region to Points Northeast (10%)	Arlington, Alexandria, & Fairfax to Southern Prince George's Co. (19%)
Central Fairfax County (19%)	Southern Prince George's County (26%)	Eastern Fairfax County to Points East (7%)	Arlington, Alexandria, & Central and Eastern Fairfax to Points East of the metro DC area (19%)
Arlington / Alexandria (17%)	Baltimore Metro Area and Points Northeast of the metropolitan Washington region (19%)	Central Fairfax County to Points East (7%)	

Future

Major Origins	Major Destinations	Major Origin-Destination Pairs	Other Major O-Ds for Combined Districts
Arlington / Alexandria (27%)	Points East of the metropolitan DC region (32%)	Arlington / Alexandria to Points East of the DC region (10%)	Arlington, Alexandria, & Fairfax to Southern Prince George's Co. (25%)
Central Fairfax County (25%)	Southern Prince George's County (28%)	Arlington / Alexandria to Southern Prince George's Co. (9%)	Arlington, Alexandria, & Central and Eastern Fairfax to Points East of the metro DC area (24%)
Eastern Fairfax County (22%)	Baltimore Metro Area and Points Northeast of the metropolitan Washington region (21%)	Central Fairfax Co. to Southern Prince George's Co. (9%)	

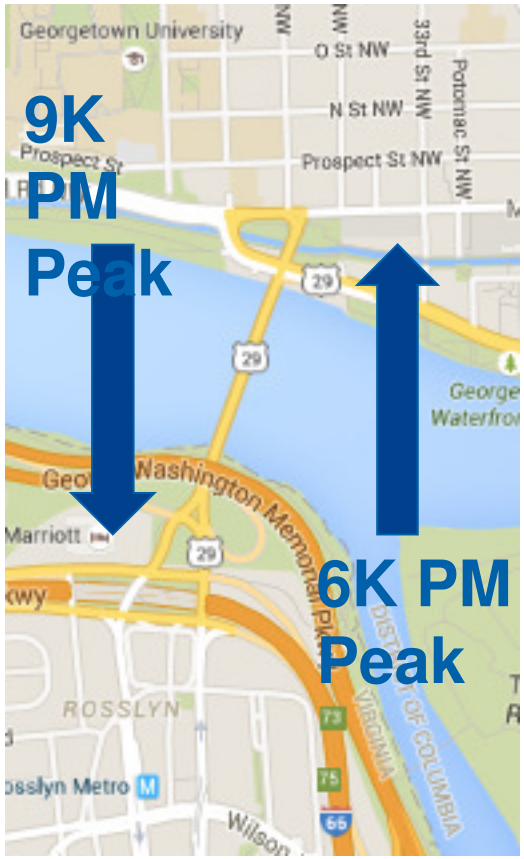
% = portion of traffic on bridge during period and direction shown

KEY BRIDGE
VOLUME AND SPEED

SPEED
(existing)

	To VA		
	Weekday AM Peak	Weekday PM Peak:	Weekend: Sat/Sun,
Speed (mph)	31.2	25.1	32.0
% of Speed Limit	104%	84%	107%

	From VA		
	Weekday AM Peak	Weekday PM Peak:	Weekend:
Speed (mph)	18.4	17.4	27.4
% of Speed Limit	61%	58%	91%



KEY BRIDGE PATTERNS
(PM PEAK, NORTHBOUND FROM VA)

Existing

Major Origins	Major Destinations	Major Origin-Destination Pairs	Other Major O-Ds for Combined Districts
Arlington / Alexandria (39%)	Washington, DC (63%)	Arlington / Alexandria to Washington, DC (18%)	Arlington / Alexandria to Washington DC & Eastern Montgomery Co. (31%)
Central Fairfax County (18%)		Central Fairfax Co. to Washington, DC (14%)	
Western Fairfax County (10%)	Eastern Montgomery County (18%)	Arlington / Alexandria to Eastern Montgomery Co. (13%)	Fairfax County to Washington, DC (24%)

Future

Major Origins	Major Destinations	Major Origin-Destination Pairs	Other Major O-Ds for Combined Districts
Arlington / Alexandria (70%)	Washington, DC (50%)	Arlington / Alexandria to Washington DC (23%)	Arlington / Alexandria ,Central Fairfax & Eastern Loudoun Co. to Washington DC (44%)
Central Fairfax County (16%)	Eastern Montgomery County (23%)	Arlington / Alexandria to Eastern Montgomery County (23%)	Arlington / Alexandria to Washington, DC , Baltimore & Points northeast of metro DC (42%)
	Baltimore and Points Northeast of metro DC (19%)	Arlington / Alexandria to Baltimore and Points Northeast of metro DC (19%)	

% = portion of traffic on bridge during period and direction shown

14TH STREET BRIDGE COMPLEX
(PM PEAK, NORTHBOUND FROM VA)

Existing

Major Origins	Major Destinations	Major Origin-Destination Pairs	Other Major O-Ds for Combined Districts
Arlington / Alexandria (50%)	Washington, DC (52%)	Arlington / Alexandria to Washington, DC (21%)	Arlington / Alexandria to DC, Prince George's Co, and Points Northeast and North (47%)
Central Fairfax County (16%)	Northern Prince George's County (14%)	Central Fairfax Co. to Washington, DC (10%)	
Eastern Fairfax County (6%)	Baltimore and Points Northeast of metro DC (12%)	Arlington / Alexandria to Northern Prince George's Co. (9%)	Fairfax and Prince William Counties to Washington DC (20%)

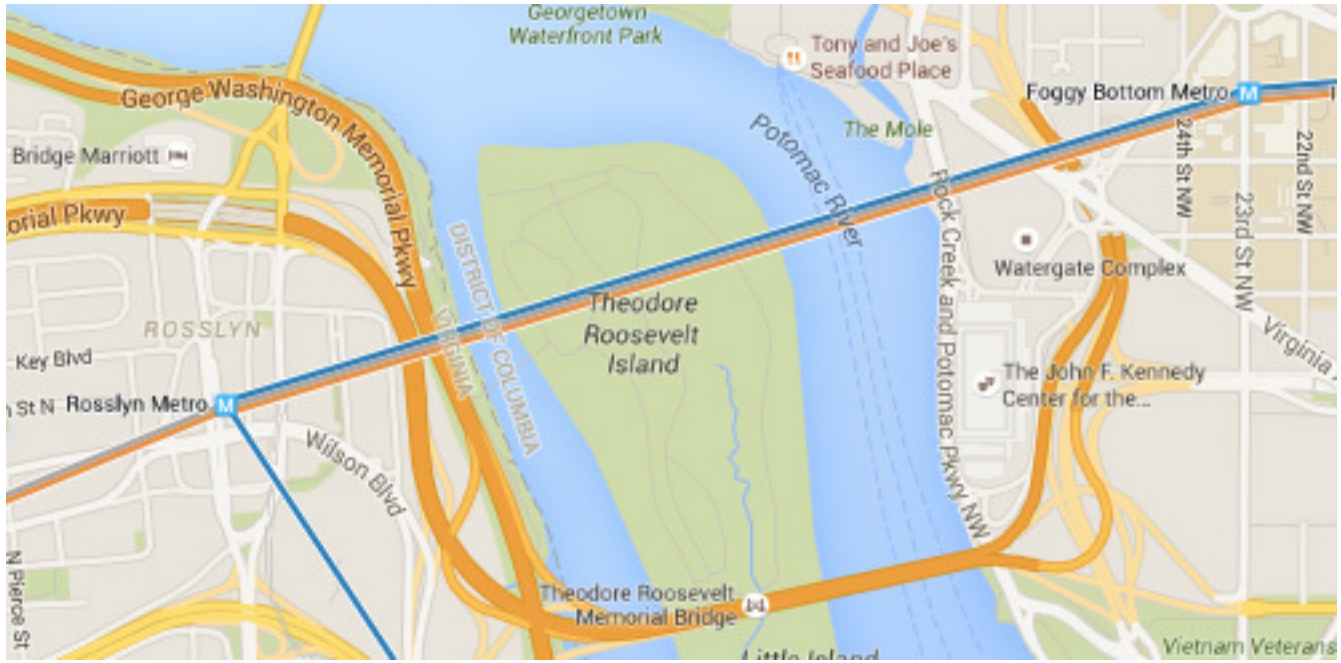
Future

Major Origins	Major Destinations	Major Origin-Destination Pairs	Other Major O-Ds for Combined Districts
Arlington / Alexandria (77%)	Washington, DC (47%)	Arlington / Alexandria to Washington DC (28%)	Arlington / Alexandria to DC, Prince George's Co, and Points Northeast and North (74%)
Central Fairfax County (13%)	Northern Prince George's County (15%)	Arlington / Alexandria to Baltimore and Points Northeast of metro DC (14%)	
	Southern Prince George's County (9%)	Arlington / Alexandria to Northern Prince George's Co. (13%)	Fairfax and Prince William Counties to Washington DC (16%)

% = portion of traffic on bridge during period and direction shown

ROSSLYN TUNNEL
WEEKDAY PM PEAK PERIOD AND DAILY PASSENGERS

Direction	Weekday Period	Passenger Volume	2040 Forecast Passenger Volume	% Increase
From VA	PM Peak Period	13,000	n.a.	n.a.
To VA	PM Peak Period	***44,300***	n.a.	n.a.
Total Both Directions	Daily	169,200	186,000	10%



ROSSLYN TUNNEL PATTERNS
(AM PEAK, EASTBOUND FROM VA)

Existing (data)

Major Origins	Major Destinations	Major Origin-Destination Pairs	Other Major O-Ds for Combined Districts
Arlington/Alexandria (53%)	Washington, D.C. (93%)	Arlington/Alexandria – Washington, D.C. (50%)	Loudoun, Prince William, and Western Fairfax to Washington, DC (12%)
Central Fairfax County (19%)		Central Fairfax County – Washington, D.C. (18%)	
Eastern Fairfax County (11%)		Eastern Fairfax County – Washington, D.C. (10%)	

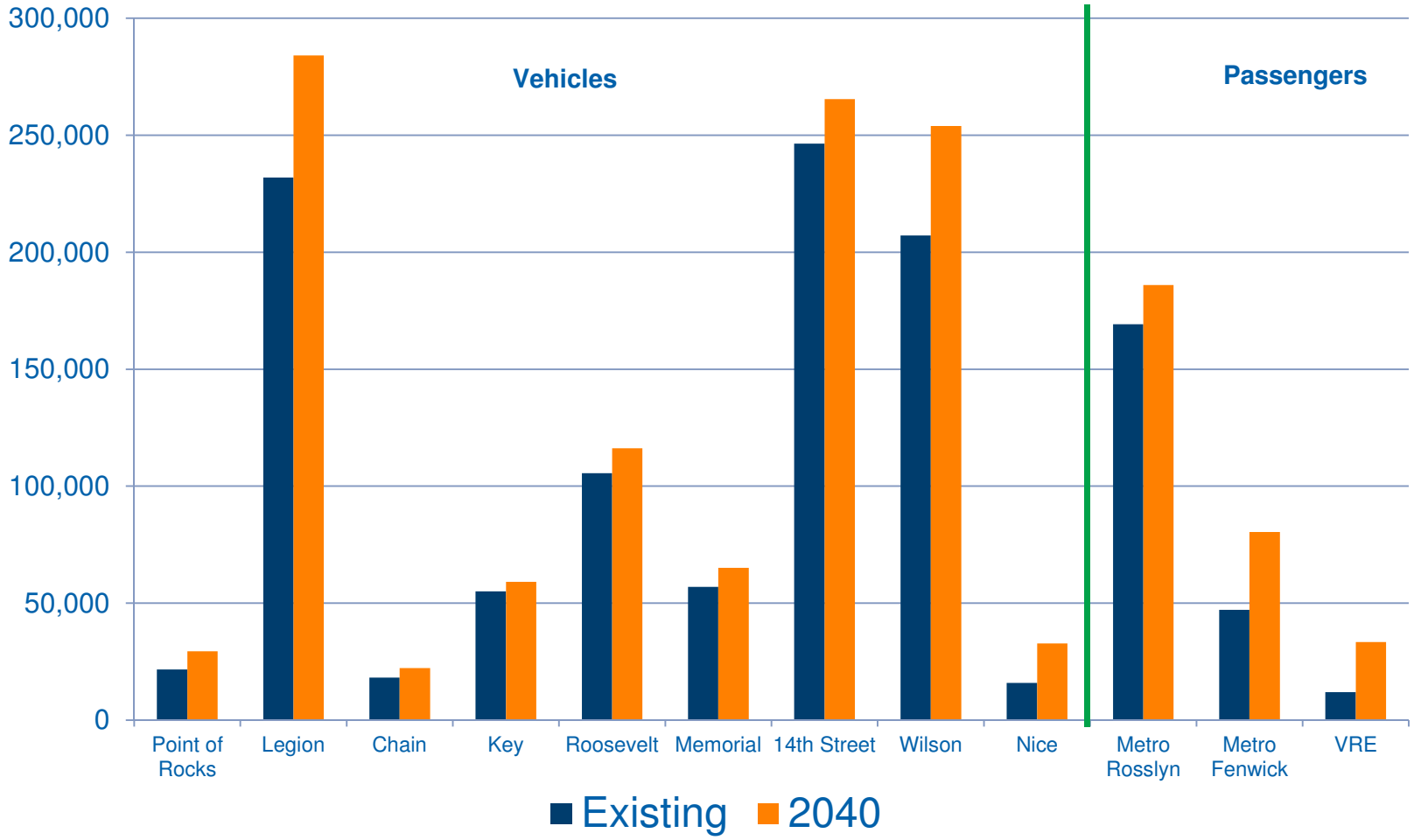
(DAILY PASSENGERS)

Future (model)

Major Origins	Major Destinations	Major Origin-Destination Pairs	Other Major O-Ds for Combined Districts
Central Fairfax County (20%)	Washington, D.C. (55%)	Central Fairfax County – Washington, D.C. (18%)	Loudoun, Prince William, and Western Fairfax to Washington, DC (17%)
Arlington/Alexandria (19%)	Arlington/Alexandria (32%)	Arlington/Alexandria – Washington, D.C. (18%)	
Washington, D.C. (17%)			

% = portion of passengers in tunnel during period and direction shown

Total Daily Volumes on Crossings



SUMMARY OF FINDINGS

- Vehicle counts only (not passengers) on highway bridges
- Interstates (except Roosevelt) carry highest daily volumes; Other bridges carry significantly lower volumes (except Roosevelt). Roosevelt volumes are between Interstates and other bridges
- American Legion Bridge suffers from the worst congestion
- Metrorail plays a significant role
  - Rosslyn Metro Tunnel volumes exceed Interstates in Peak Periods
  - Approx. 35% of a.m. peak crossings FROM Virginia via Metrorail
  - Approx. 28% of p.m. peak crossings TO Virginia via Metrorail
- Bridges serve different markets; O-D patterns widely dispersed
- Volumes and passengers forecast to increase by 2040; % Growth greatest on more distant bridges

CONTEXT FOR FINDINGS

- Wilson Bridge was replaced in 2012 – 6 lane bridge was replaced with new 10 lane bridge with reserved space for transit
- Replacement of the Route 301 Nice Bridge was being considered by Maryland Toll Authority under previous Administration
  - With reduction in tolls it is unclear whether MdTA plans to continue with development of the project
- Rosslyn Tunnel is at capacity in the peak hours
  - 8 car trains will increase capacity by ~15%
  - Significant investment is required in the future to further address core capacity issues on WMATA
- Bridges located in “core” are unlikely to ever be widened

ADDITIONAL CONSIDERATIONS

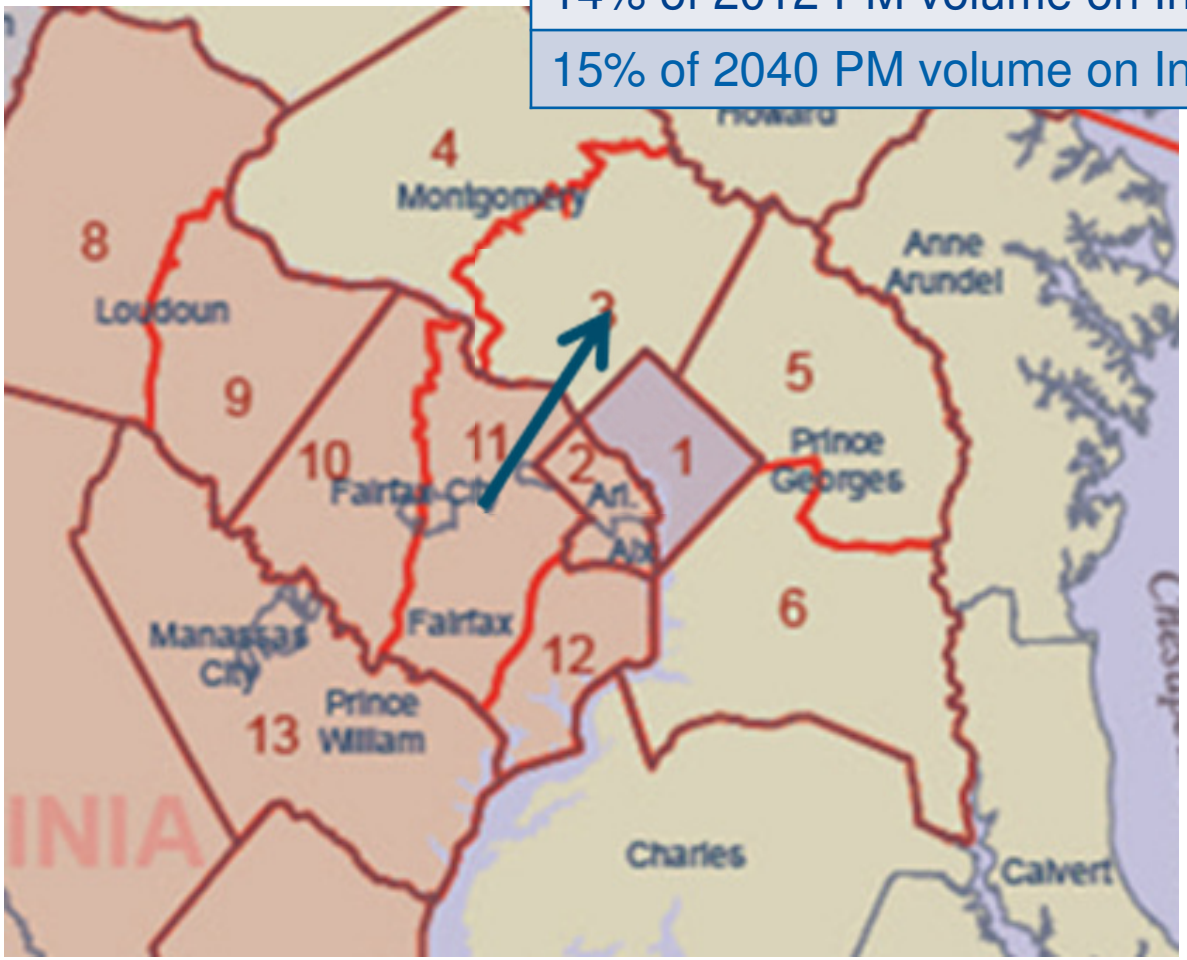
- **Addressing conditions at the American Legion Bridge is recommended by staff as an area for the Board to focus future efforts**
  - **Suffers worst congestion**
  - **Projected largest growth in volumes in 2040**

- **Several options to address issues at American Legion Bridge**
  - **Extend HOT lanes across American Legion Bridge to the 270 spur**
  - **Construct new 'outer' bridge crossing**

American Legion Bridge Origin and Destinations

"I" Movement:

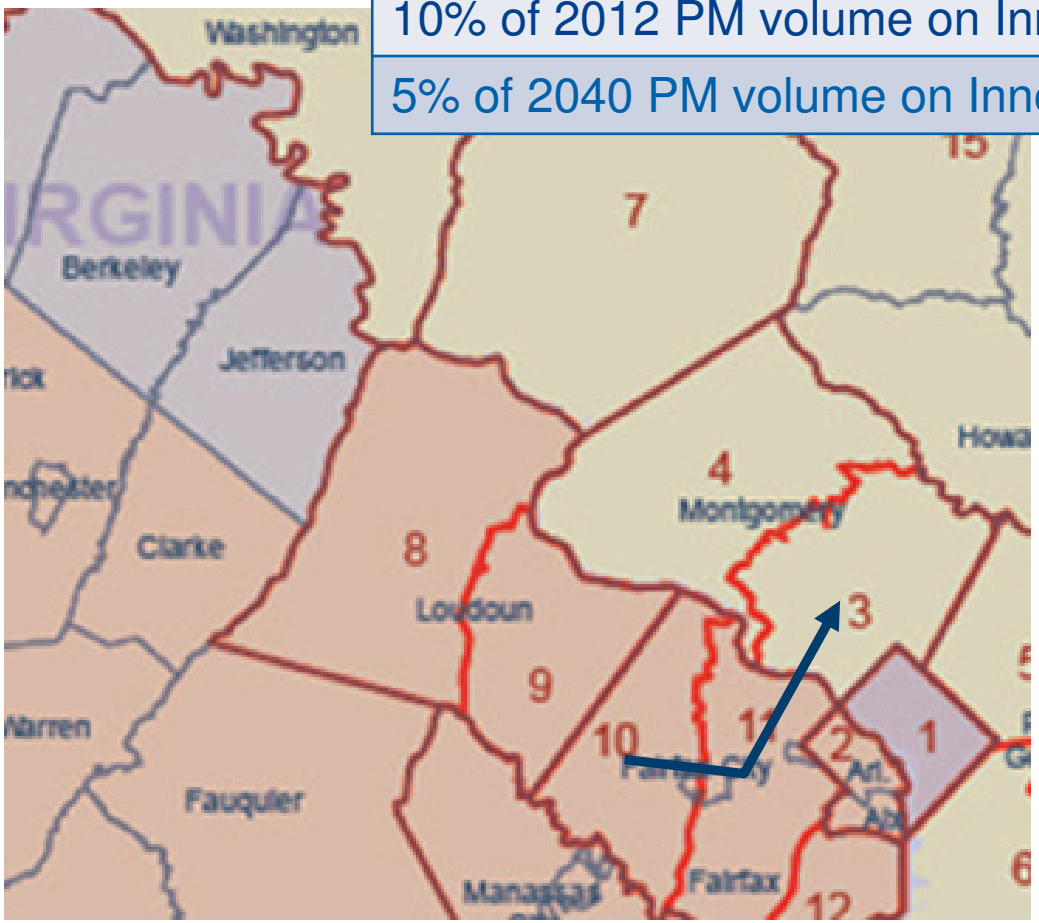
14% of 2012 PM volume on Inner Loop
15% of 2040 PM volume on Inner Loop



American Legion Bridge Origin and Destinations

"L" Movement (part): Western Fairfax to Eastern Montgomery

10% of 2012 PM volume on Inner Loop
5% of 2040 PM volume on Inner Loop

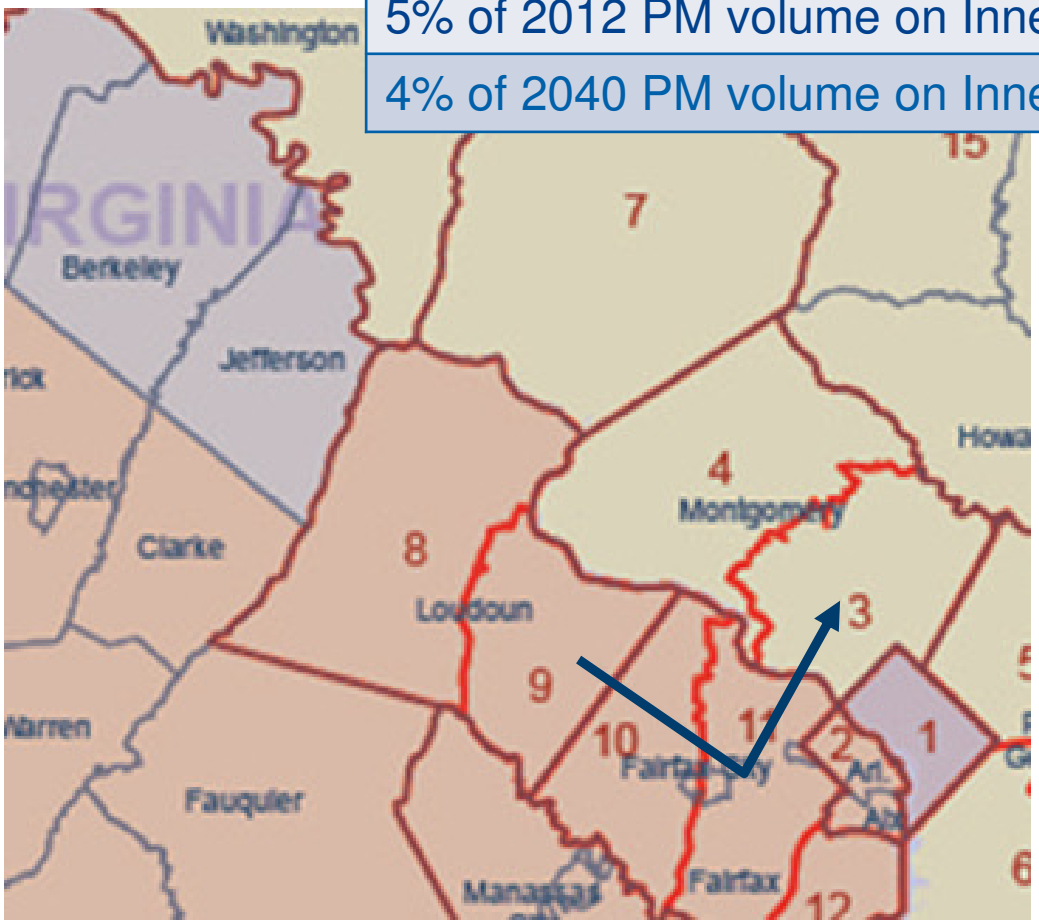


American Legion Bridge Origin and Destinations

"L" Movement (part): Eastern Loudoun to Eastern Montgomery

5% of 2012 PM volume on Inner Loop

4% of 2040 PM volume on Inner Loop

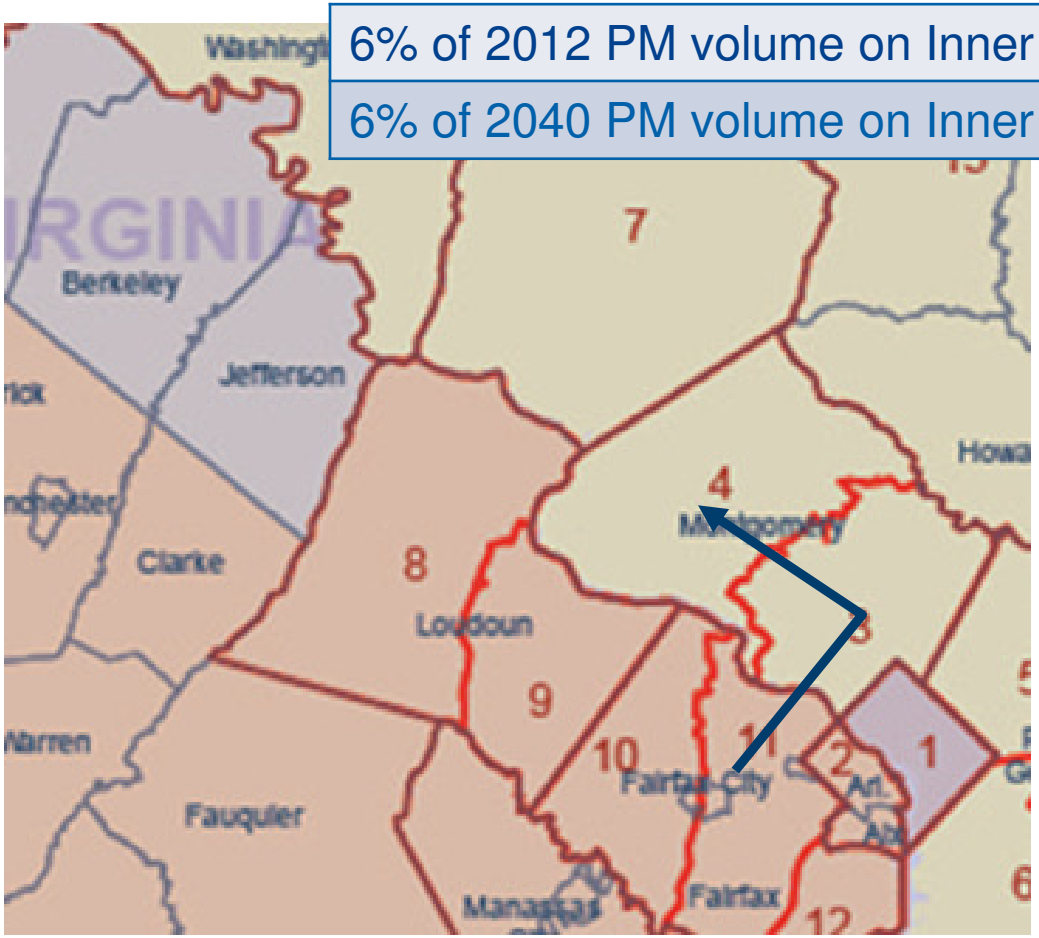


American Legion Bridge Origin and Destinations

"L" Movement (part): Central Fairfax to Western Montgomery

6% of 2012 PM volume on Inner Loop

6% of 2040 PM volume on Inner Loop

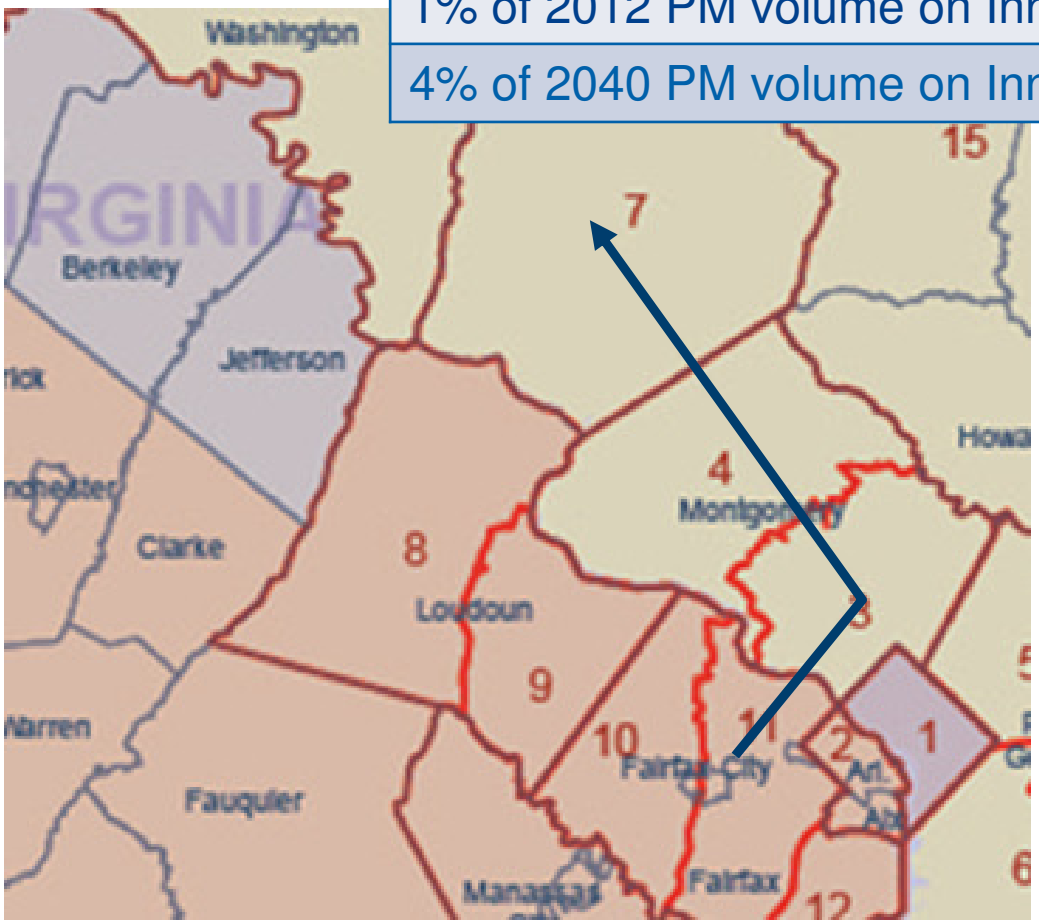


American Legion Bridge Origin and Destinations

"L" Movement (part): Central Fairfax to Frederick

1% of 2012 PM volume on Inner Loop

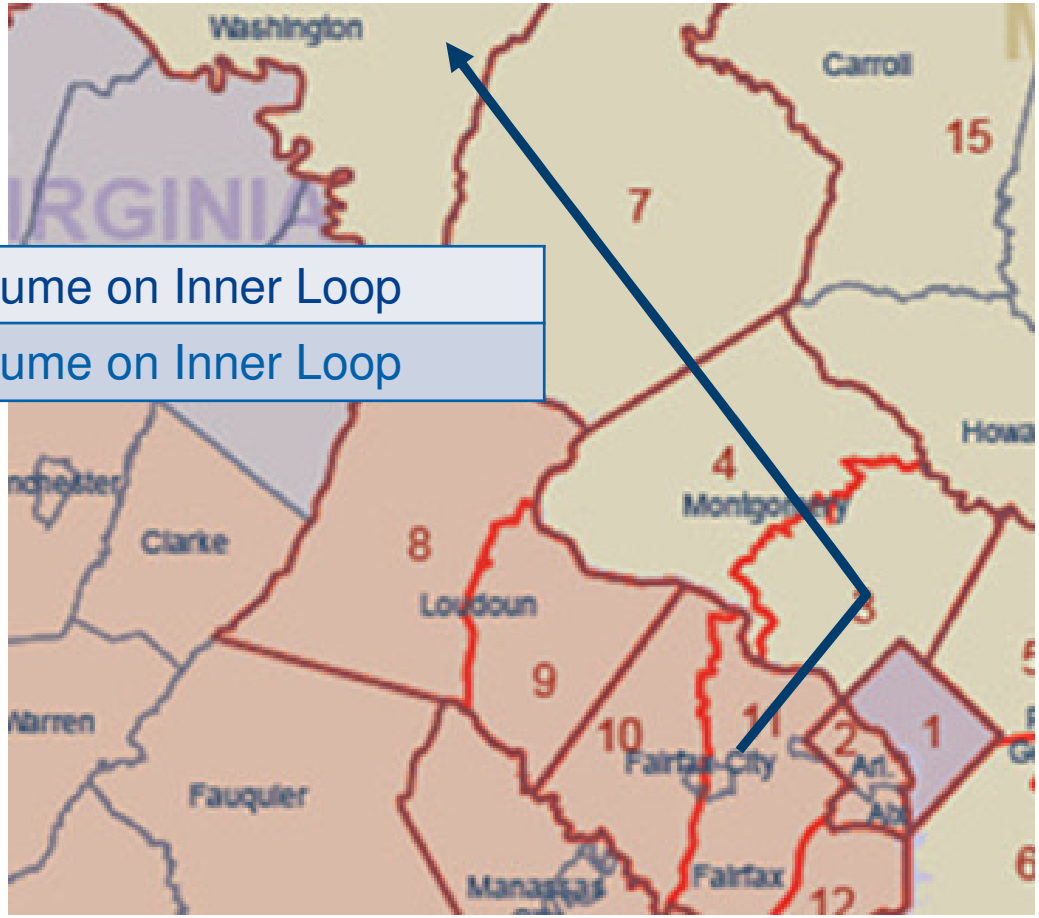
4% of 2040 PM volume on Inner Loop



American Legion Bridge Origin and Destinations

"L" Movement (part): Central Fairfax to Points Northwest

1% of 2012 PM volume on Inner Loop
3% of 2040 PM volume on Inner Loop

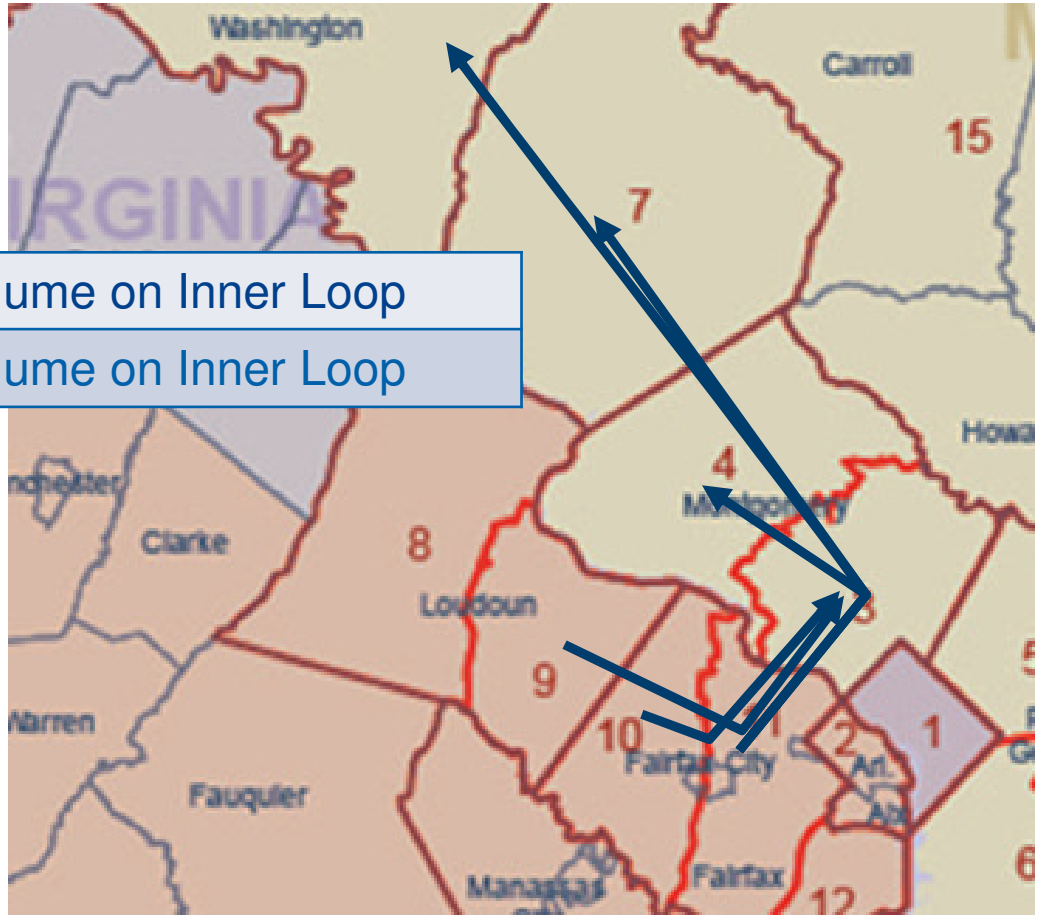


American Legion Bridge Origin and Destinations

"L" Movement (part): Major Components

22% of 2012 PM volume on Inner Loop

20% of 2040 PM volume on Inner Loop

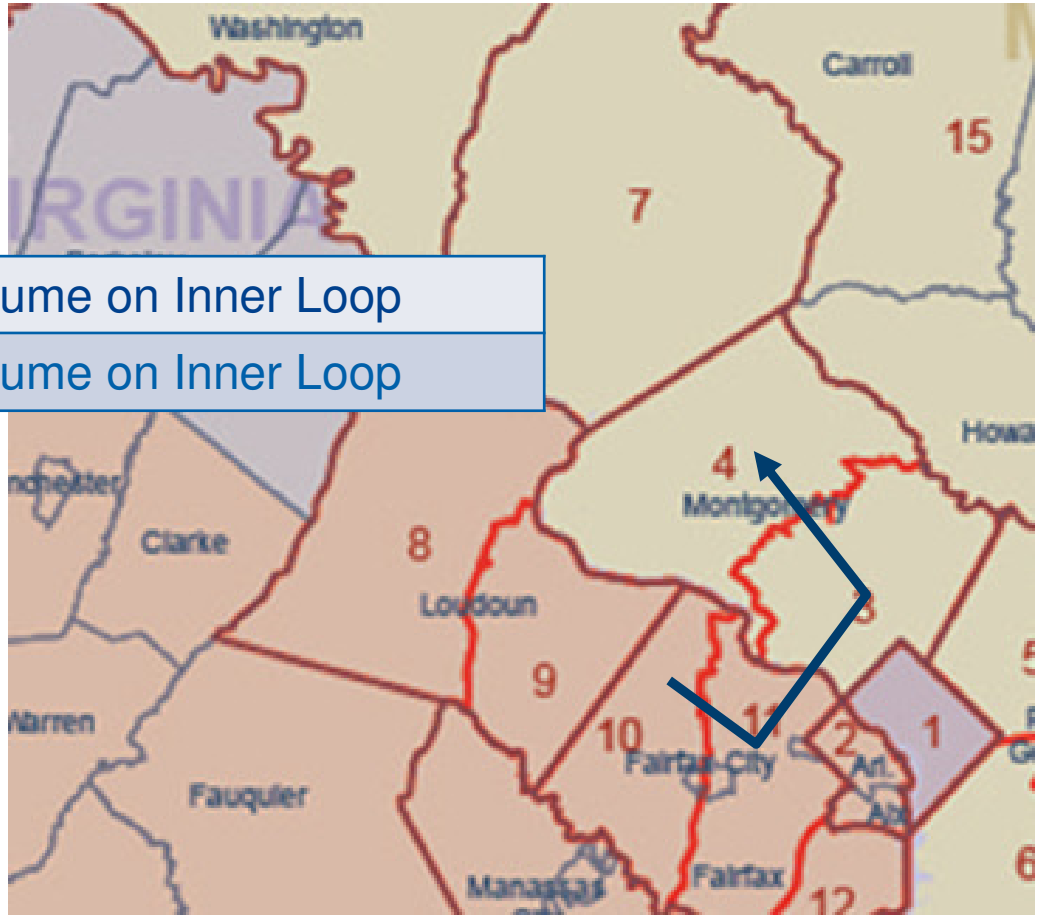


American Legion Bridge Origin and Destinations

"U" Movement (part): Western Fairfax to Western Montgomery

4% of 2012 PM volume on Inner Loop

2% of 2040 PM volume on Inner Loop

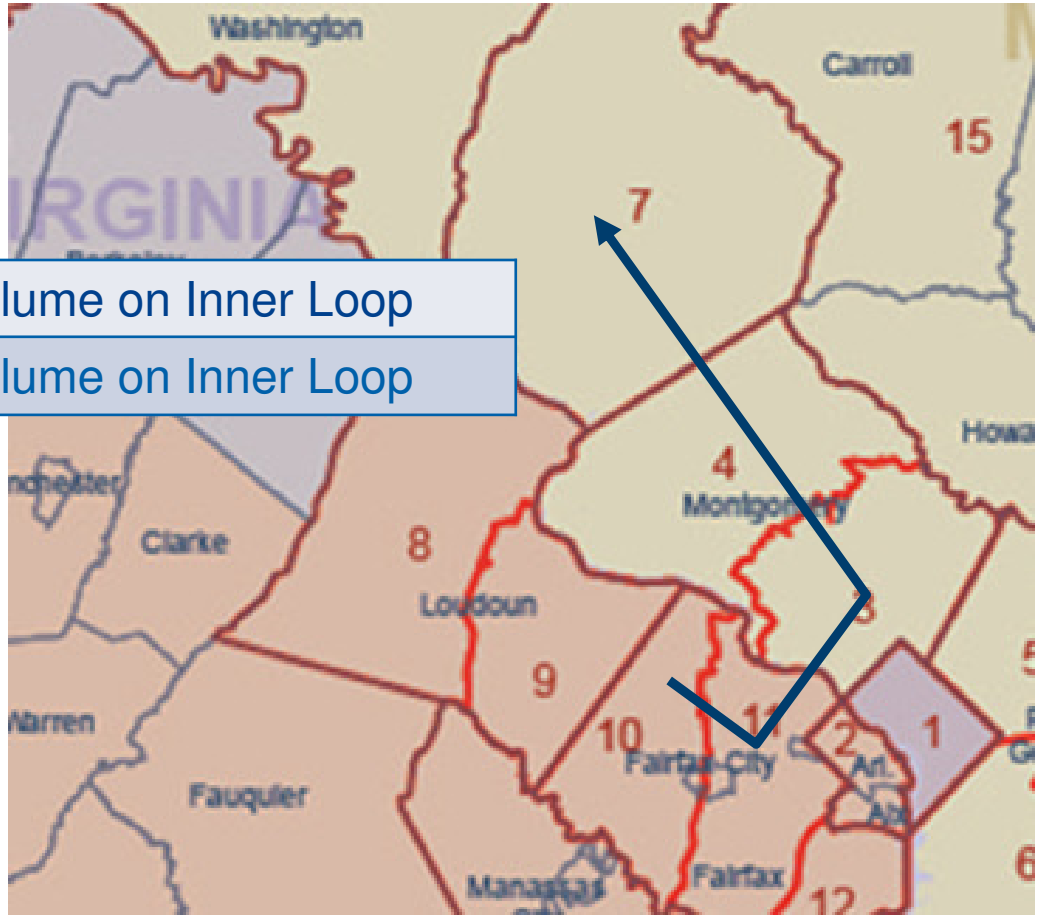


American Legion Bridge Origin and Destinations

"U" Movement (part): Western Fairfax to Frederick

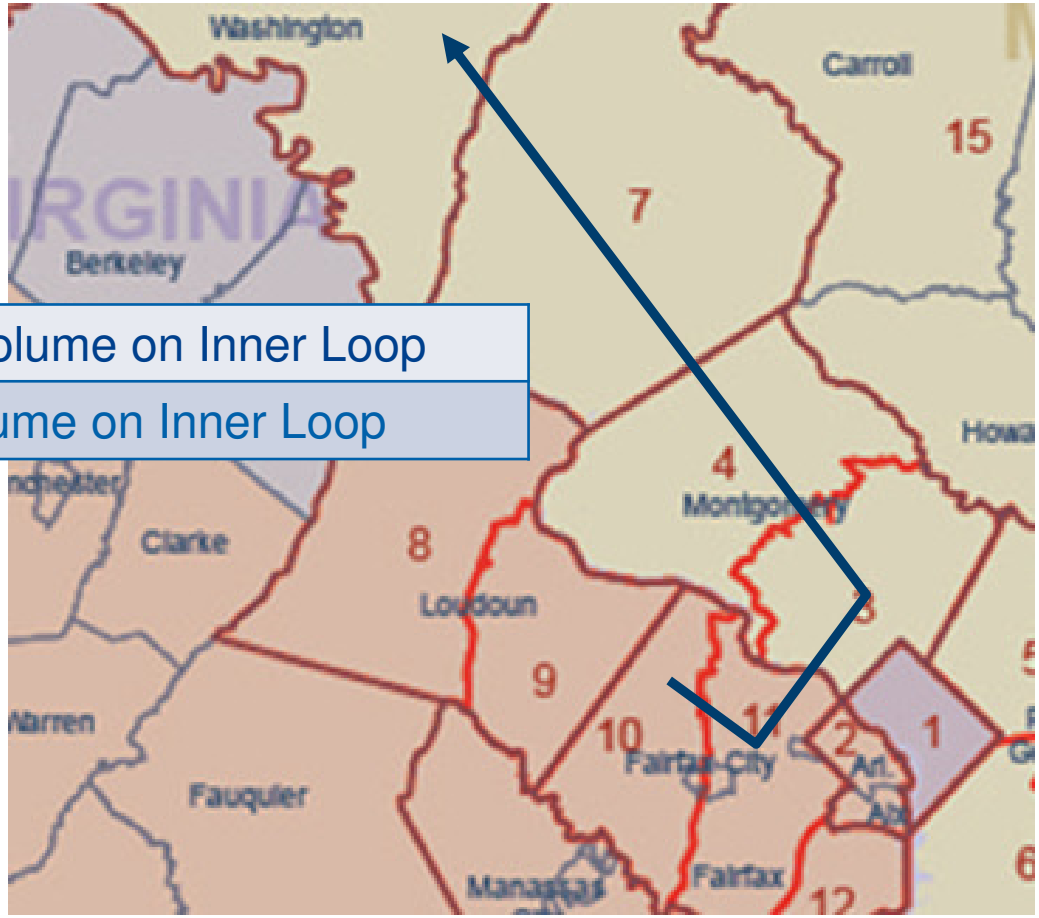
0.1% of 2012 PM volume on Inner Loop

0.2% of 2040 PM volume on Inner Loop



American Legion Bridge Origin and Destinations

"U" Movement (part): Western Fairfax to Points Northwest



0.2% of 2012 PM volume on Inner Loop

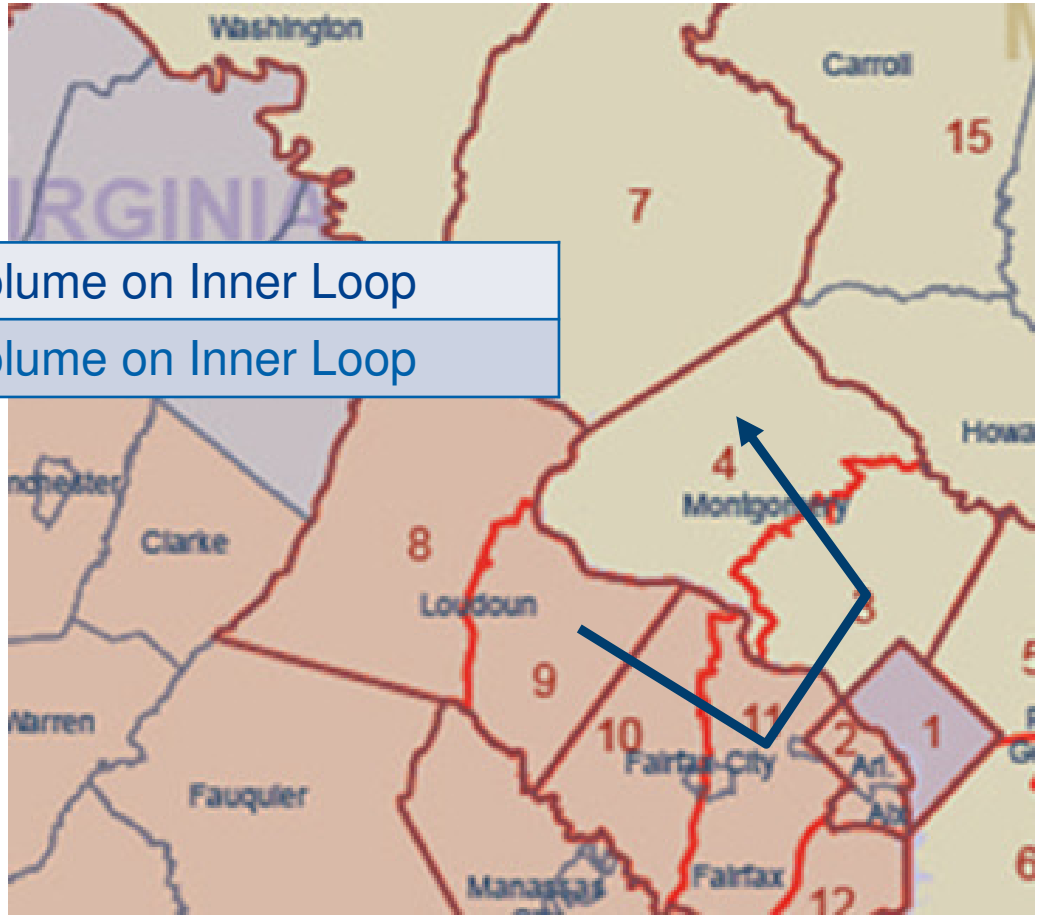
0% of 2040 PM volume on Inner Loop

American Legion Bridge Origin and Destinations

"U" Movement (part): Eastern Loudoun to Western Montgomery

1% of 2012 PM volume on Inner Loop

1% of 2040 PM volume on Inner Loop

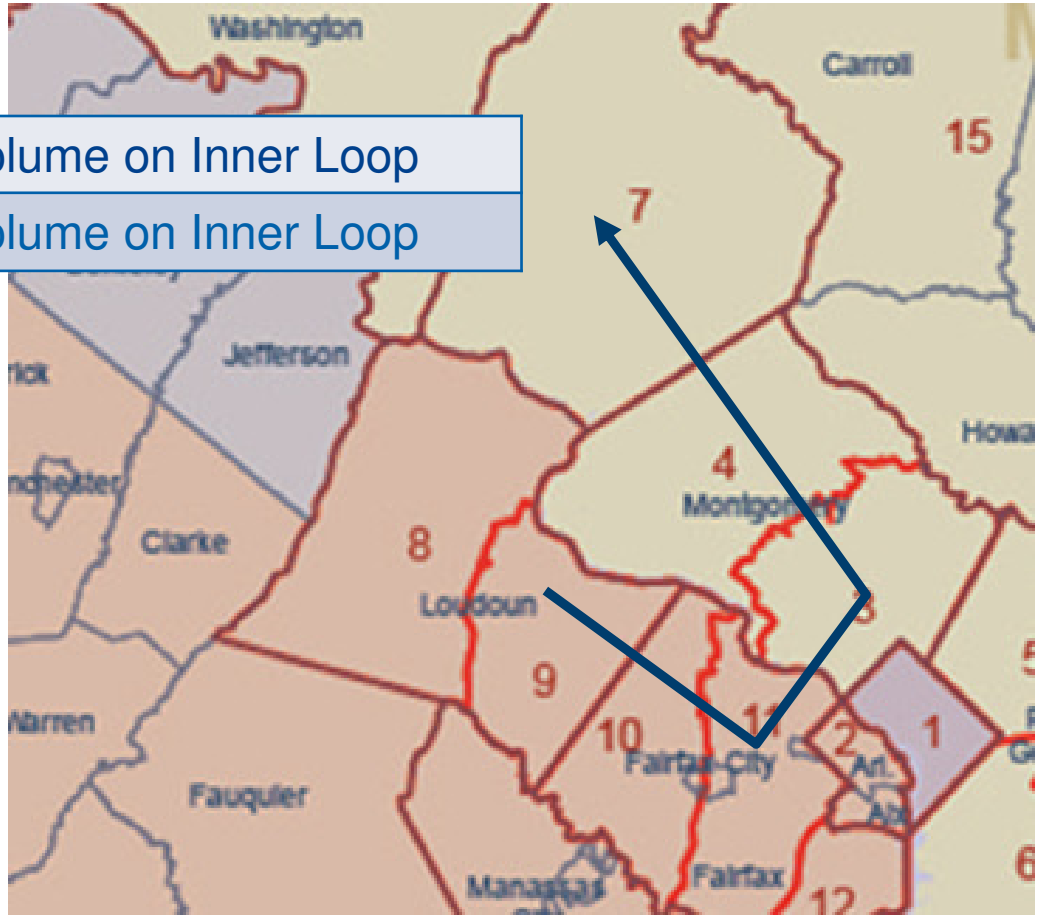


American Legion Bridge Origin and Destinations

"U" Movement (part): Eastern Loudoun to Frederick

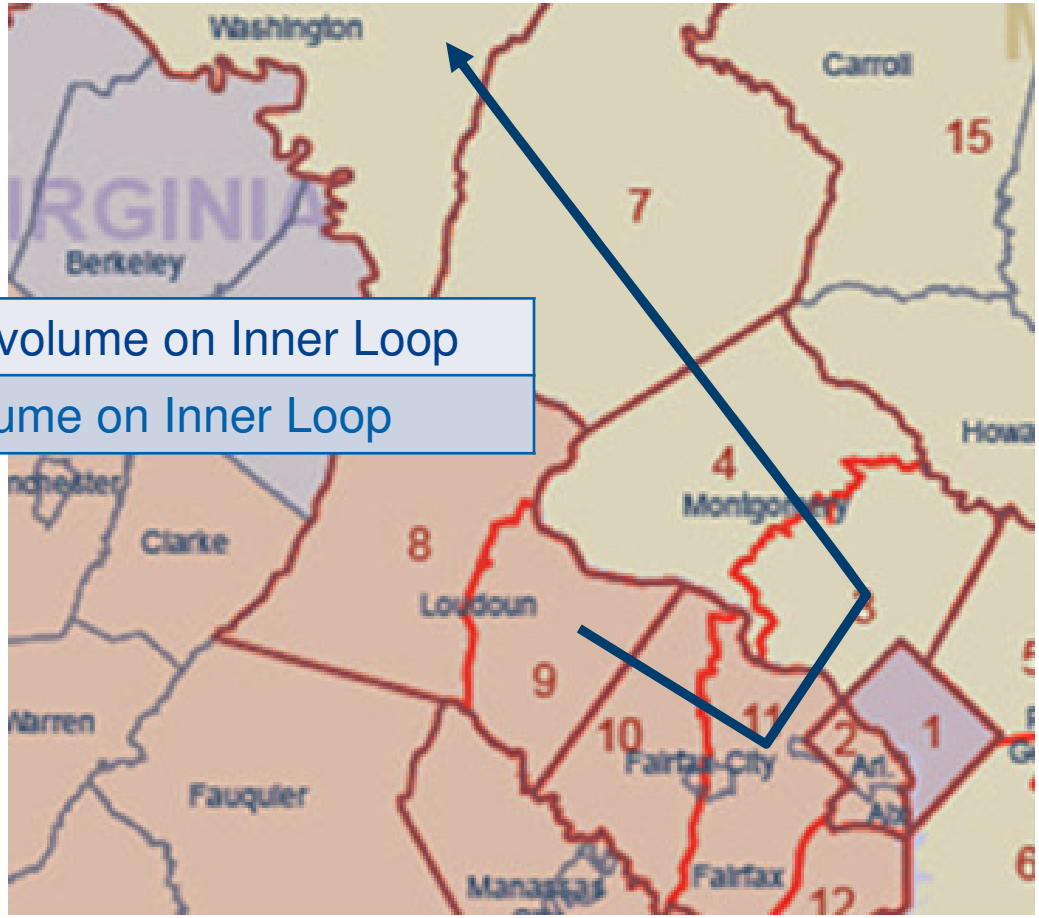
0.1% of 2012 PM volume on Inner Loop

0.2% of 2040 PM volume on Inner Loop



American Legion Bridge Origin and Destinations

"U" Movement (part): Eastern Loudoun to Points Northwest



0.02% of 2012 PM volume on Inner Loop

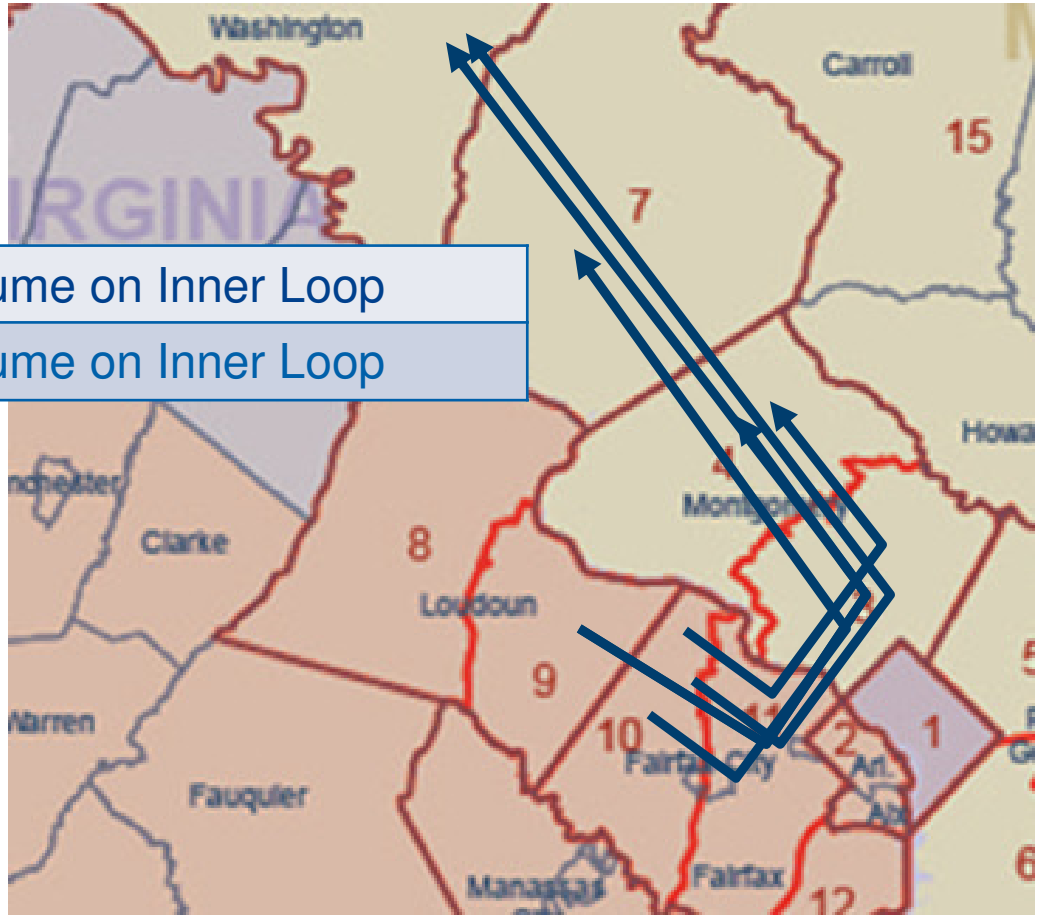
0% of 2040 PM volume on Inner Loop

American Legion Bridge Origin and Destinations

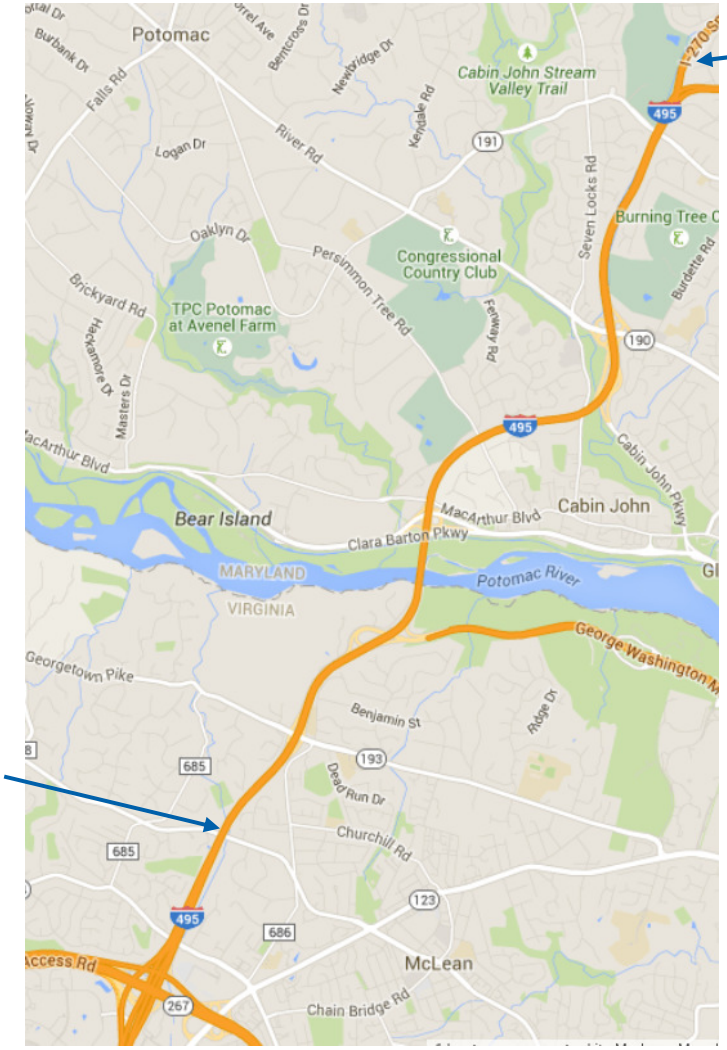
"U" Movement (part): Major Components

5% of 2012 PM volume on Inner Loop

4% of 2040 PM volume on Inner Loop



American Legion Bridge Other Considerations

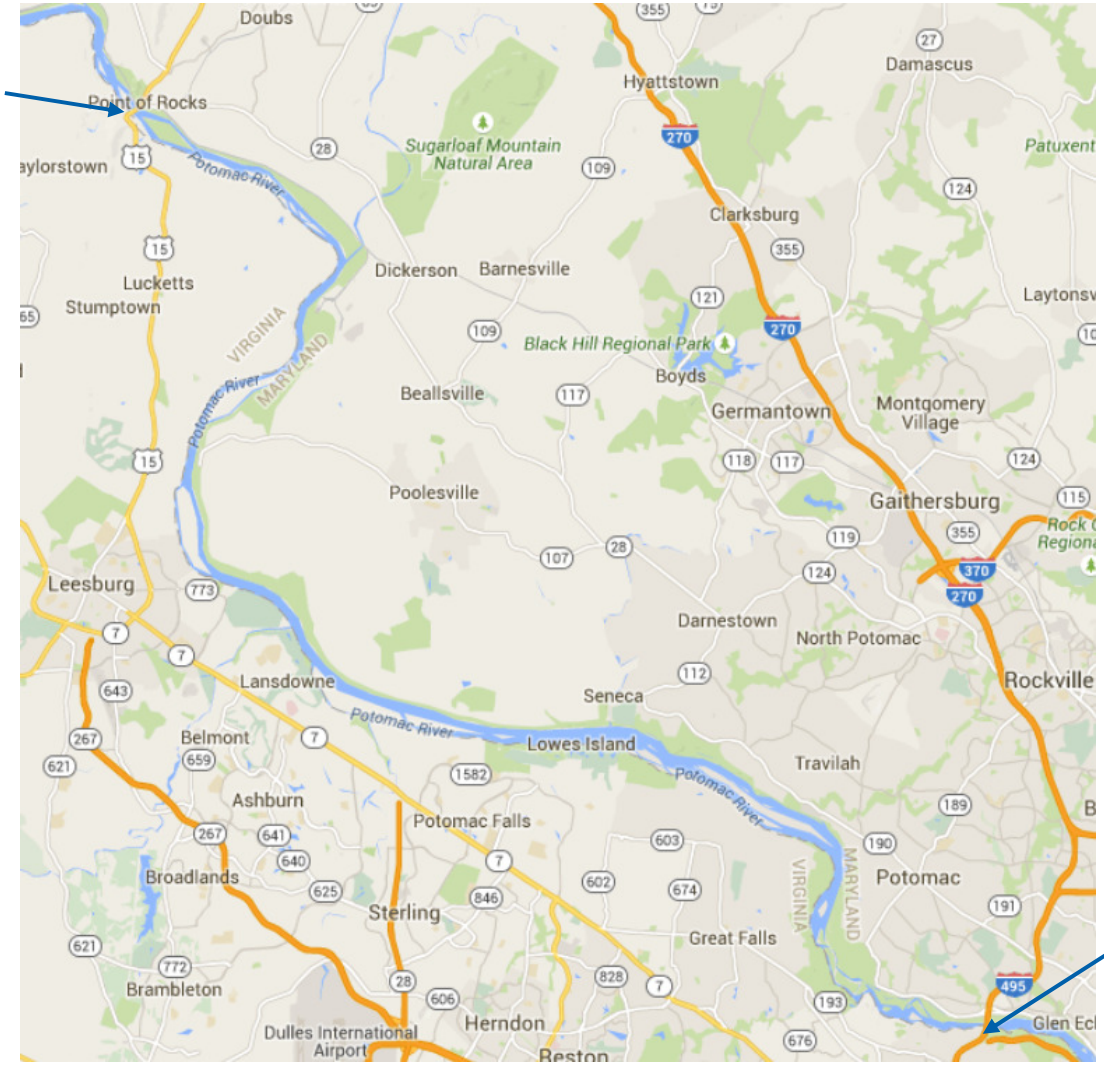


I-270Spur

I-495 Express Lanes Terminus

American Legion Bridge Other Considerations

Point of Rocks (US 15)



American Legion Bridge (I-495)

American Legion Bridge

- **Staff recommend that extending HOT lanes across American Legion Bridge to 270 spur be the top priority for addressing western Potomac River crossings**
- **With concurrence of the Board, staff will begin outreach to Maryland to determine interest in examining options for extending HOT lanes to the 270 spur**
- **Does not eliminate the benefits of a future 'outer' crossing to address the needs for interconnectivity /crossing Potomac River**