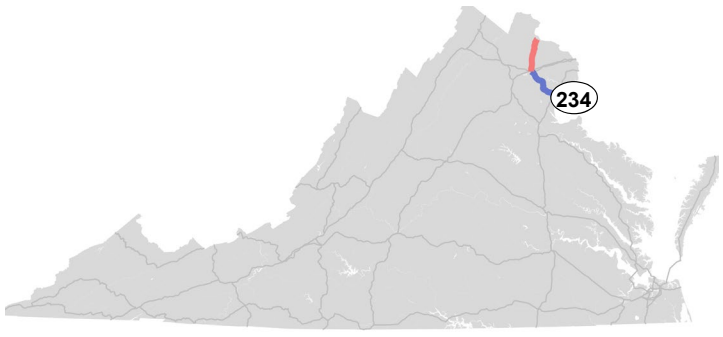
VTrans2040 Multimodal Transportation Plan

Corridors of Statewide Significance Needs Assessment

North-South Corridor (G)



Office of INTERMODAL Planning and Investment

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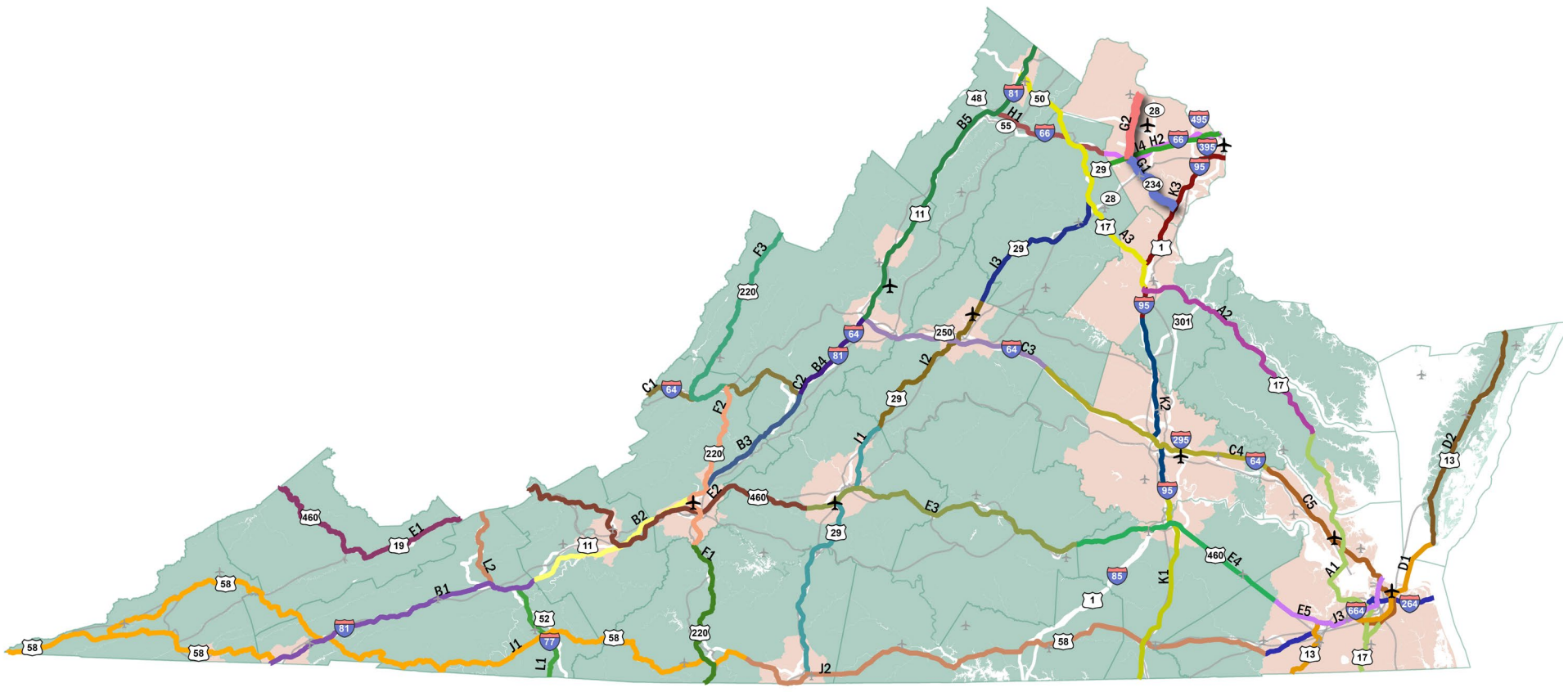
See *Corridors of Statewide Significance, Needs Assessment: Executive Summary and Methodology Report* for details on the overall assessment approach, data sources, and performance measures used throughout this report.

I. Corridor Overview



Corridor of Statewide Significance
(color varies by segment)

Railroad

Airport Facility
(grey denotes not a commercial service airport)

Metropolitan Planning Organization Area

Corridors of Statewide Significance

A	Coastal Corridor (US 17)
B	Crescent Corridor (I-81)
C	East-West Corridor (I-64)
D	Eastern Shore Corridor (US 13)
E	Heartland Corridor (US 460)
F	North Carolina to West Virginia Corridor (US 220)
G	North-South Corridor (Route 234)
H	Northern Virginia Corridor (I-66)
I	Seminole Corridor (US 29)
J	Southside Corridor (US 58)
K	Washington to North Carolina Corridor (I-95)
L	Western Mountain Corridor (I-77)

The North-South Corridor (Corridor G) connects I-95 to Dulles International Airport and is generally defined by Route 234 between I-66 and US 1 and the proposed Bi-County Parkway north of I-66. Route 659 and Northstar Boulevard are also included in the corridor's 45-mile length. The North-South Corridor serves as a connector between activity centers in and around Woodbridge, Manassas, Gainesville, and areas surrounding Dulles International Airport. It also provides connections between the Washington to North Carolina (Corridor K), Northern Virginia (Corridor H), and Seminole (Corridor I) Corridors. The corridor exists entirely within the area covered by the Northern Virginia portion of the Metropolitan Washington MPO.

Parallel facilities within the North-South Corridor are limited in capacity. Route 619, a rural two-lane road, parallels Route 234 from I-95 to I-66. North of I-66, US 15 and Route 28 serve as a parallel facility to the proposed alignment of the Bi-County Parkway, but neither route connects to I-95. This corridor does not run concurrently with any interstate or major highway in Virginia.

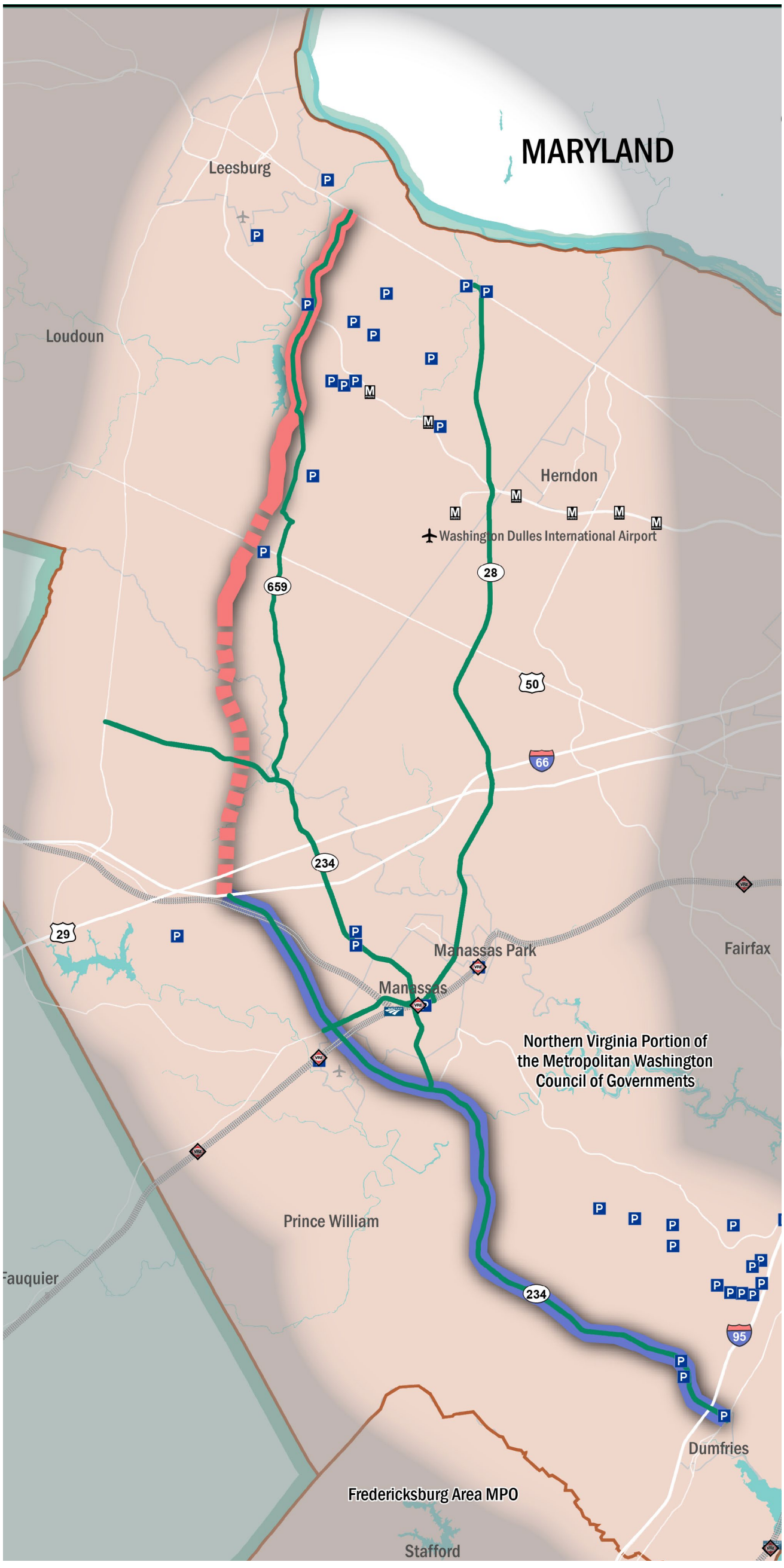
Passenger travel along the North-South Corridor has multiple options beyond driving, including:

- Line-haul bus service from the Potomac and Rappahannock Transportation Commission (PRTC) and Loudoun County Transit, available to passengers traveling the North-South Corridor, and to commuters traveling from the corridor to Washington, DC;
- Virginia Railway Express (VRE), providing commuter service at Woodbridge on the Fredericksburg Line and at Manassas on the Manassas Line into Washington DC;
- Metrorail, which does not currently provide service to the corridor; however, expansion of the Silver Line will bring Metrorail service to Ashburn, near the northern section of the corridor;
- Clusters of Park-and-Ride lots, found in Ashburn, Manassas, and Woodbridge and, in large part, served by commuter bus and VRE service;
- A single Greyhound bus station, near the corridor at Woodbridge;
- Amtrak's Cardinal, Crescent, and Northeast Regional routes serving the station at Manassas, with the station at Woodbridge receiving service only from the Northeast Regional route; and
- Dulles International Airport, the largest and busiest airport in the region, located to the east of the corridor. Two reliever airports, Manassas Regional Airport and Leesburg Executive Airport, are also accessible.

Although no rail facilities run parallel to the North-South Corridor, several rail lines do cross it, including Norfolk Southern's Crescent Corridor and CSX's National Gateway Corridor, which connect the North-South Corridor to the Virginia Inland Port to the west and the Port of Virginia facilities in the Hampton Roads Area. Freight regularly travels to and from the North-South Corridor through Dulles International Airport, and construction of the Bi-County Parkway will allow this freight to more directly access I-66, I-95, and the Norfolk Southern and CSX rail corridors.

Corridor Components

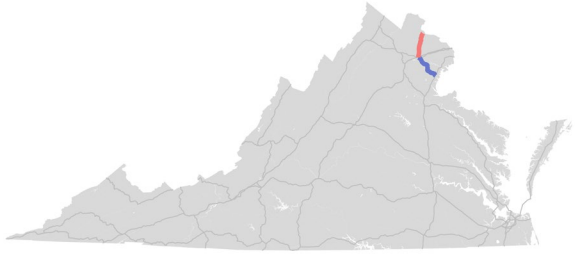
Highway Facilities	
Primary Facility	• Route 234 • Nothstar Boulevard • Proposed Bi-County Parkway
Other Highway Facilities	• Route 234 Business • Route 28 • Route 659
Transit Services	
	• Intercity bus service
Airport Facilities	
	• Washington Dulles International



Corridor Segments:
- G1
- G2

- Corridor Component Road
- Railroad
- Airport Facility
- Amtrak Facility
- Greyhound Facility
- VRE Facility
- Metrorail Facility
- Port Facility
- Park & Ride Facility

- MPO Area
- Planning District Area



Demographics and Economic Trends

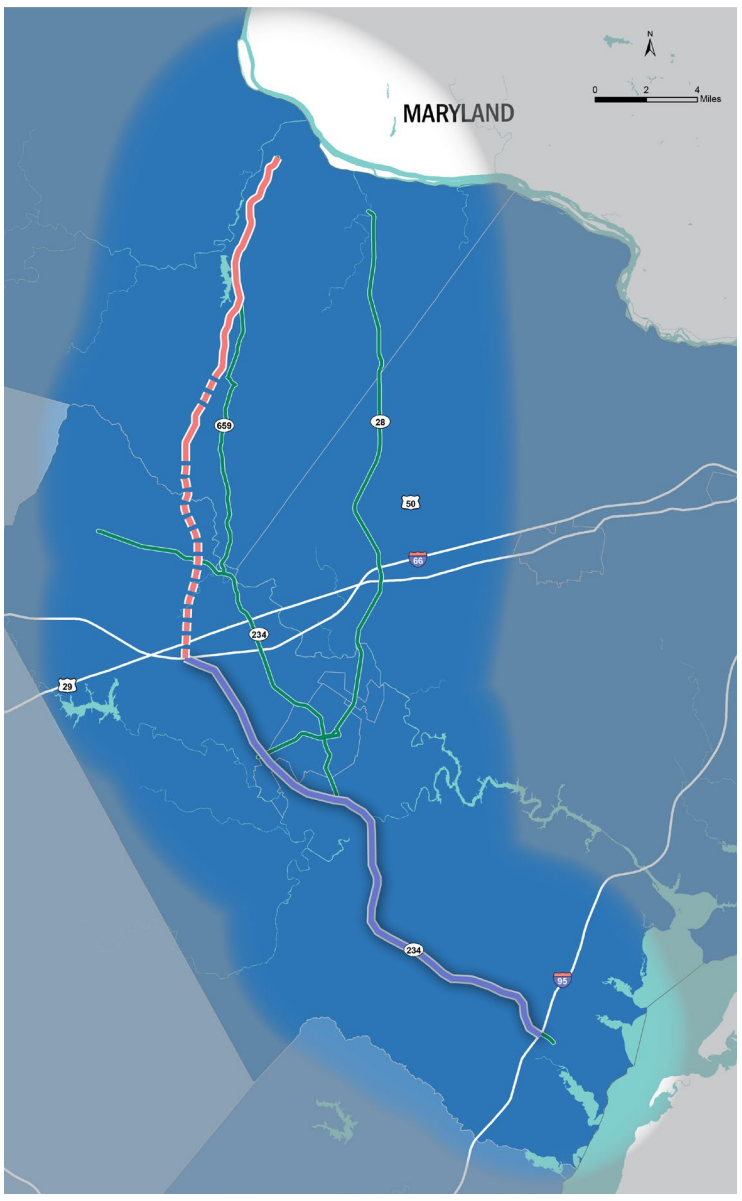
The entirety of Corridor G lies within high-density population centers with greater than 500 persons per square mile (Prince William and Loudoun Counties and the City of Manassas).

Between 2012 and 2025, Loudoun County is anticipated to see the largest population growth (greater than 30 percent) among jurisdictions along the corridor. Prince William County and the City of Manassas Park are anticipated to have the next highest population growth - 11 and 22 percent, respectively. The already densely-populated City of Manassas is expected to experience relatively lower growth (approximately eight percent). Overall, population along the corridor is expected to grow significantly.

Current employment density is highest in the Cities of Manassas and Manassas Park. Employment growth will be high (higher than 26 percent) along most of the corridor; however, employment rates in the City of Manassas and Fairfax County will grow at a slightly slower pace. Corridor G is entirely within the Northern Virginia portion of the Metropolitan Washington MPO Area, where the three largest industry sectors by GDP include professional/scientific/technical services, public administration, and retail trade.

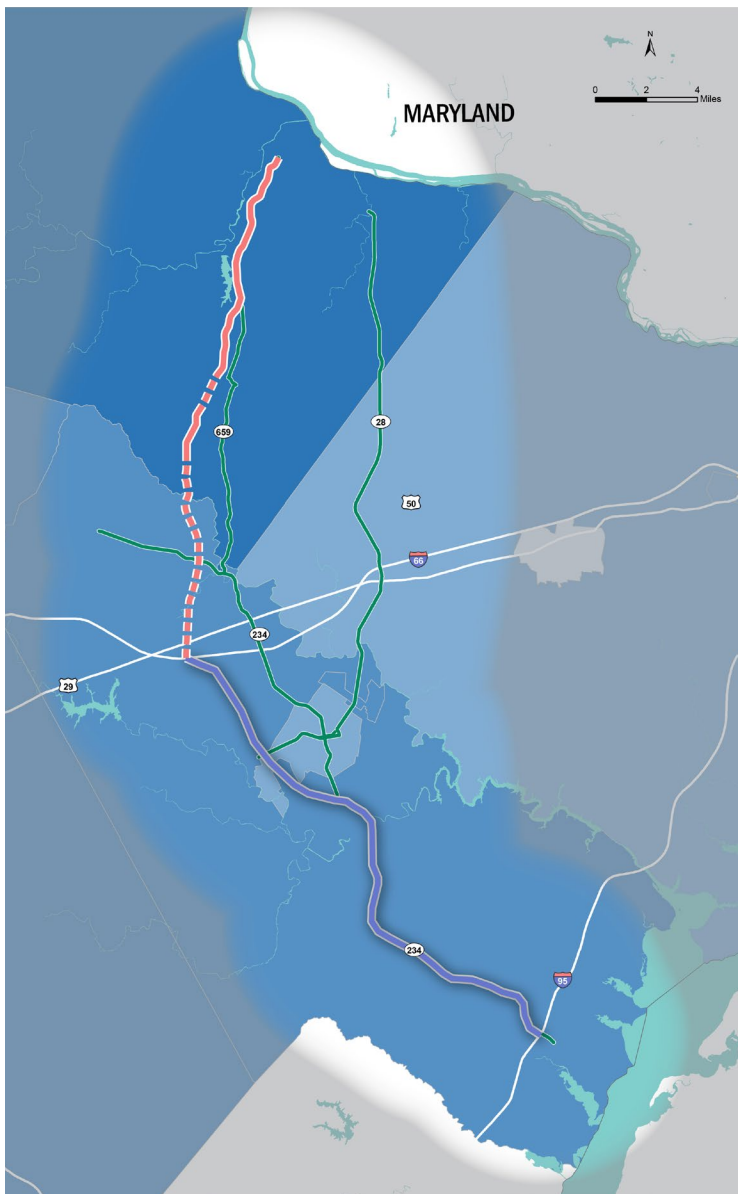
2012 Population Density Persons / Square Mile

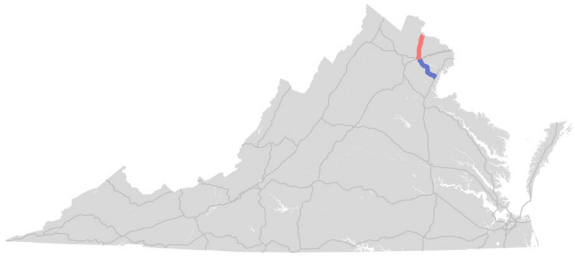
- 0 - 50
- 50 - 100
- 100 - 250
- 250 - 500
- 500 +



Population Growth (2012-2025 Percent Change)

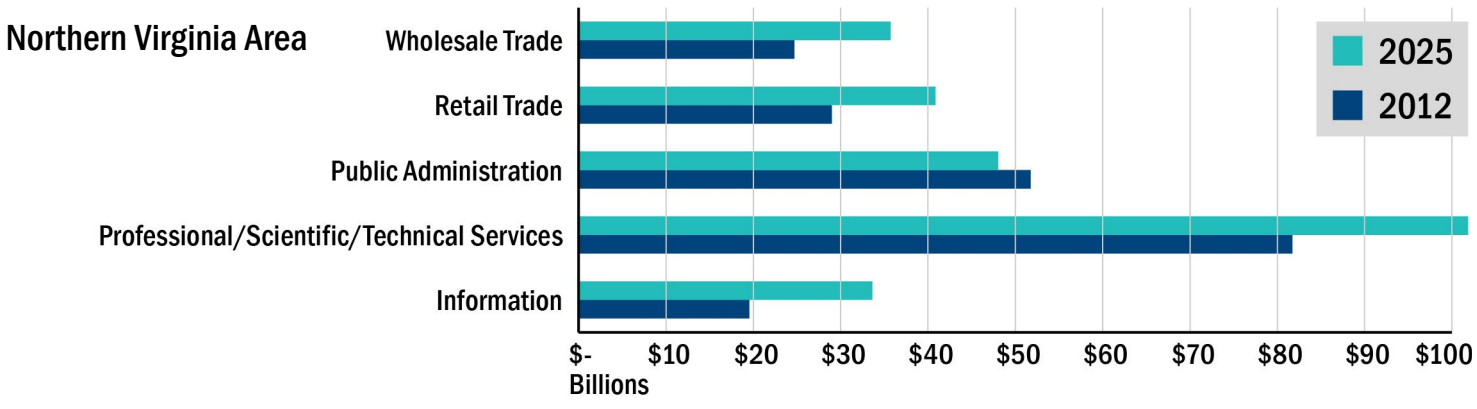
- -8% - 0%
- 1% - 5%
- 6% - 10%
- 11% - 25%
- 26% - 57%





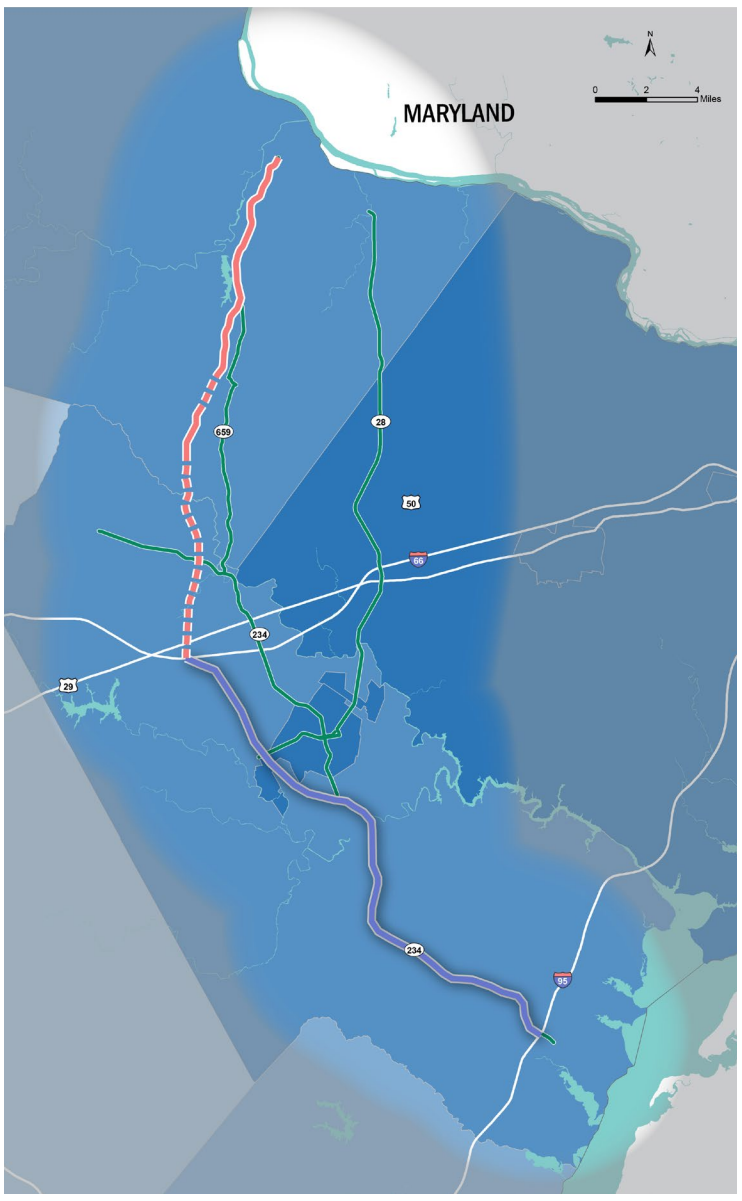
CORRIDOR G OVERVIEW

Top Industries (GDP)



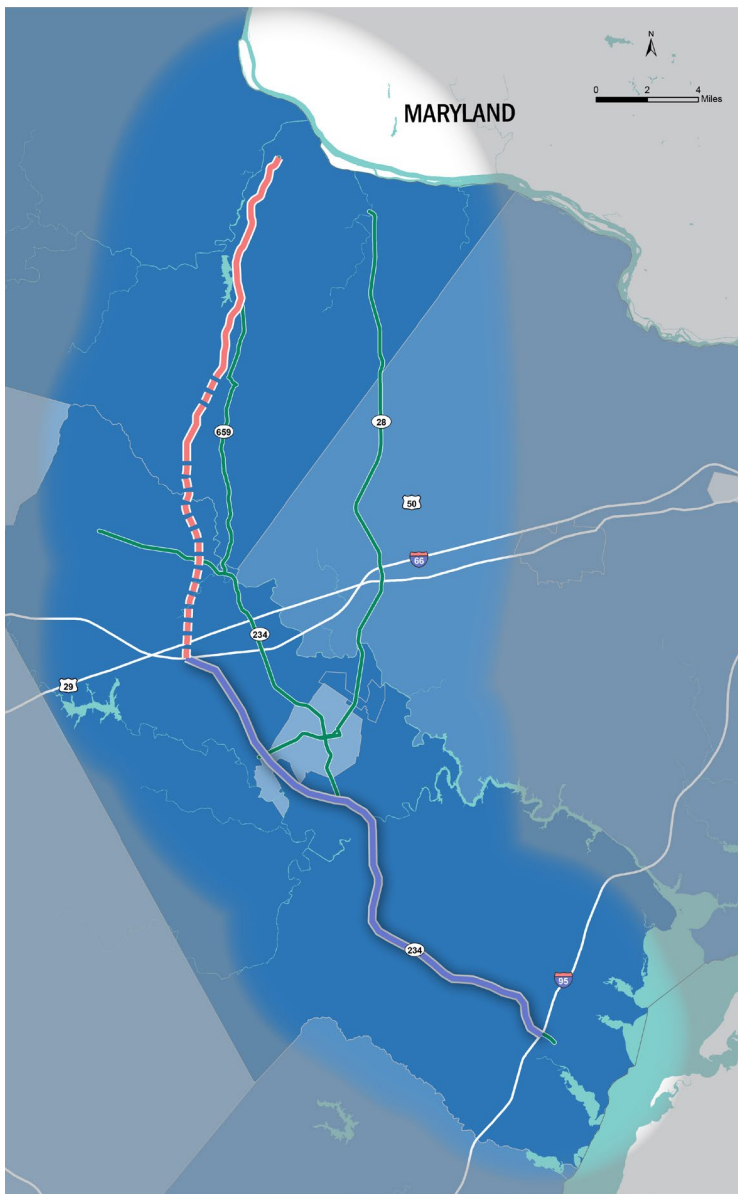
2012 Employment Density Jobs / Square Mile

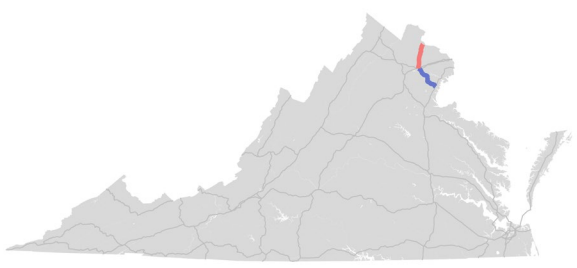
- < 25
- 25 - 100
- 100 - 250
- 250 - 500
- > 500



Employment Growth (2012-2025 Percent Change)

- -7% - 0%
- 1% - 5%
- 6% - 10%
- 11% - 25%
- 26% - 69%



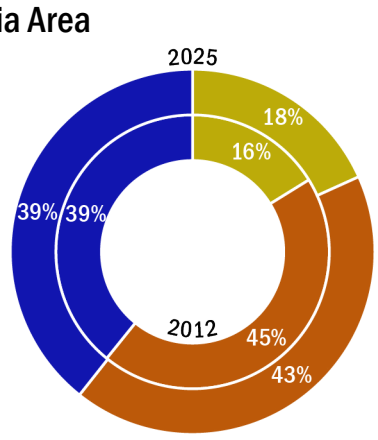


Corridor Travel Patterns

Passenger

Corridor G is located entirely within the Northern Virginia portion of the Metropolitan Washington Council of Governments (MWCOG) region, and thus accommodates a very large portion of local traffic. Almost 60 percent of the traffic along the corridor is represented by trips with both origin and destination ends within the Northern Virginia Area. An additional 35 percent of the traffic on this corridor has a trip origin or destination outside of Northern Virginia, including other areas within the MWCOG MPO area (such as the District of Columbia and Maryland). Only eight percent of traffic on Corridor G is through traffic passing through the Northern Virginia portion of the MPO area.

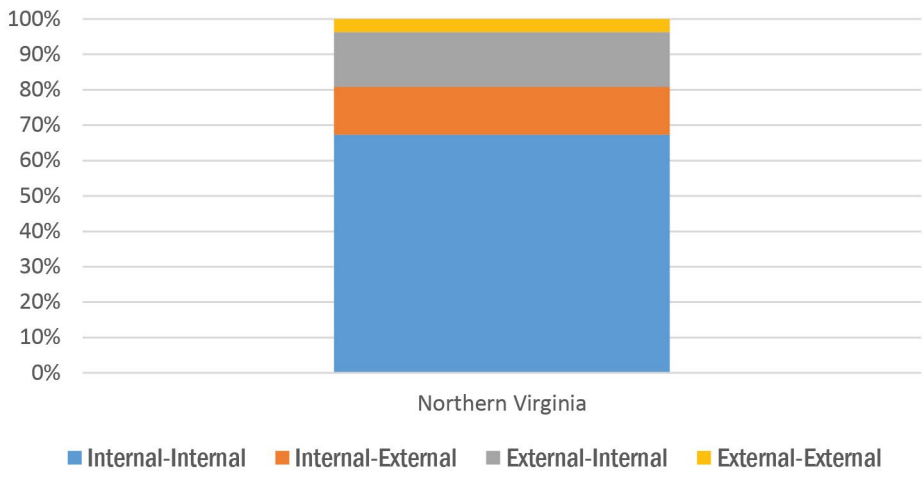
Northern Virginia Area



GDP by Sector, 2012 and 2025

- Freight Dependent
- Local Serving
- Knowledge-based

Distribution of Internal and External Travel

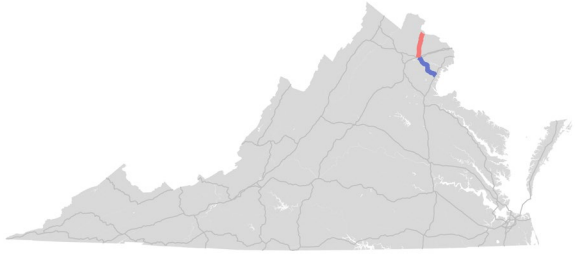


Freight

By truck, Corridor G carried four million tons of freight worth $2 billion in 2012, and is estimated to carry five million tons of freight worth $4 billion in 2025. Truck freight traffic using Corridor G is mostly comprised of freight movements within Virginia, as 50 percent of truck freight tonnage on the corridor is intra-state traffic and just three percent of freight tonnage passes through the Commonwealth.

Truck Freight

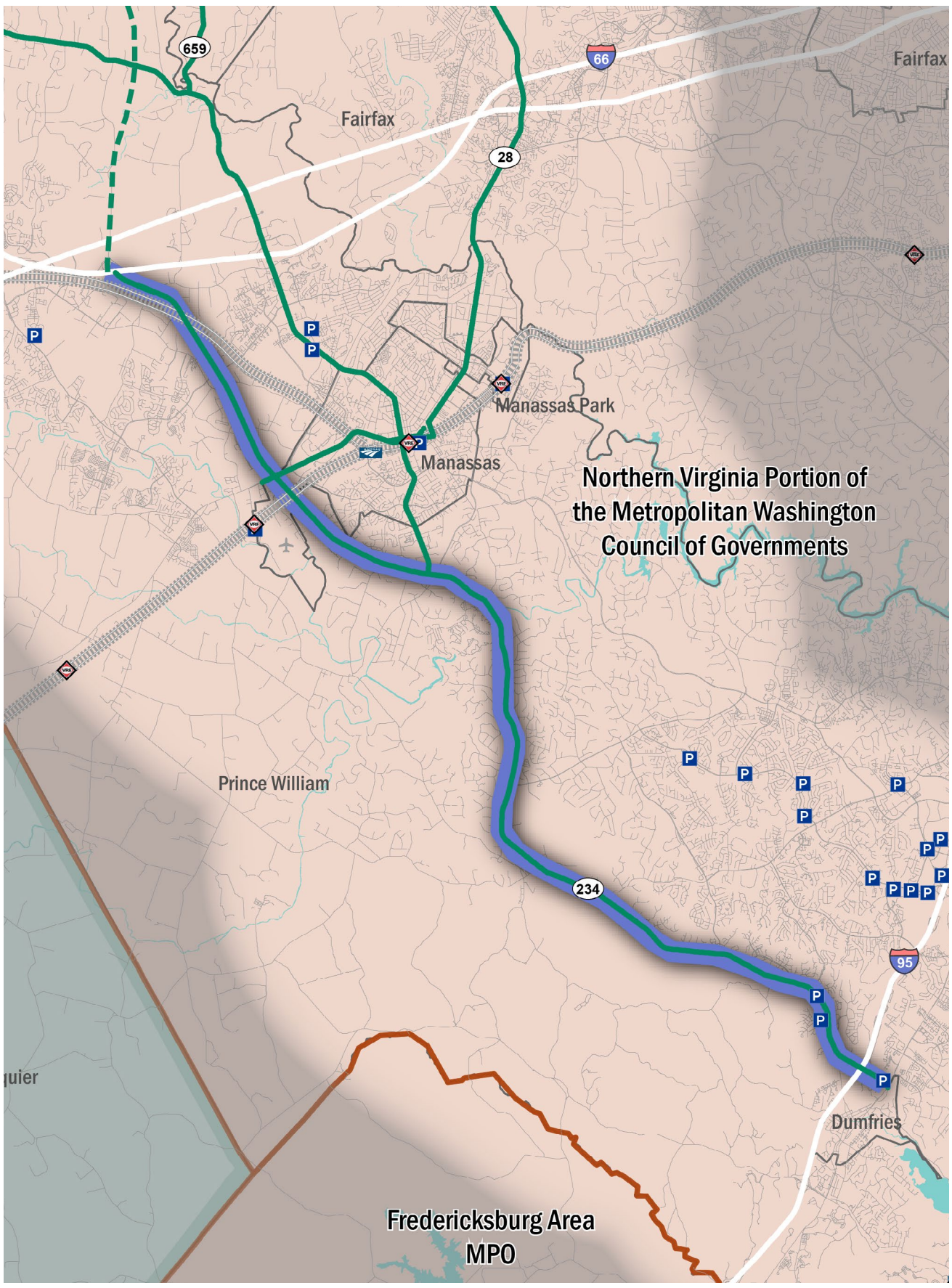
	2012	2025
Truck Freight Value	$2 Billion	$4 Billion
Truck Freight Tonnage	4 Million Tons	5 Million Tons
Freight Value per Ton	$535	$833
Corridor Tonnage Passing Through	3%	3%



II. Segment G1

Corridor Segment G1 Components

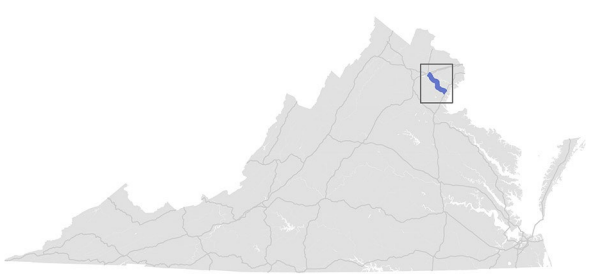
- Route 234
- Route 234 Business
- Route 28



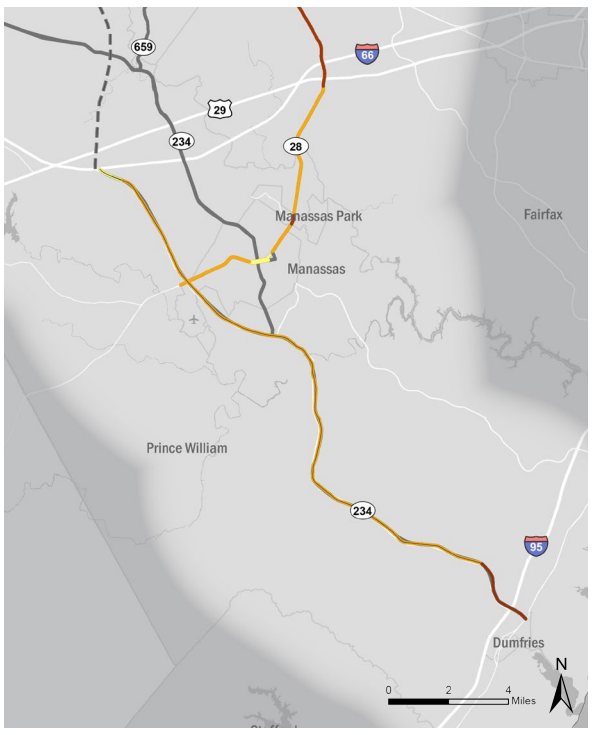
Segment G1

Corridor Component Road
Railroad
Airport Facility
Amtrak Facility
Greyhound Facility
VRE Facility
Metrorail Facility
Port Facility
Park & Ride Facility

MPO Area
Planning District Area

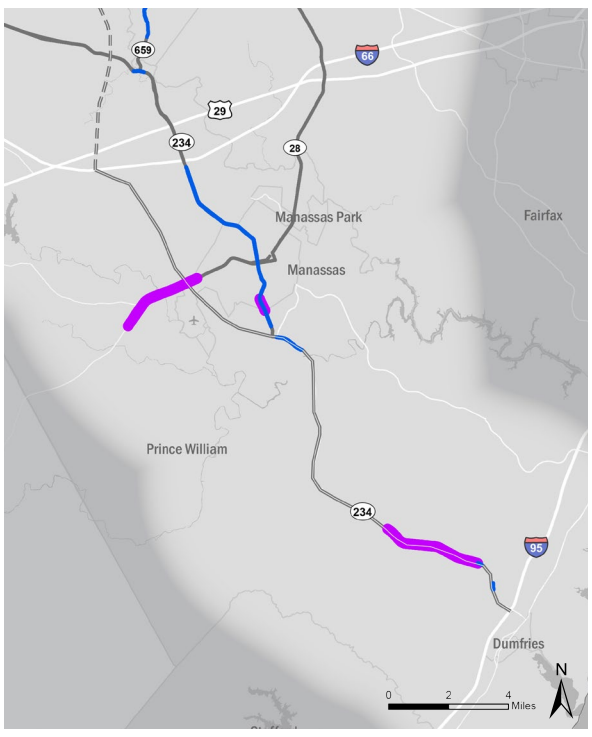


G1 SEGMENT PROFILE



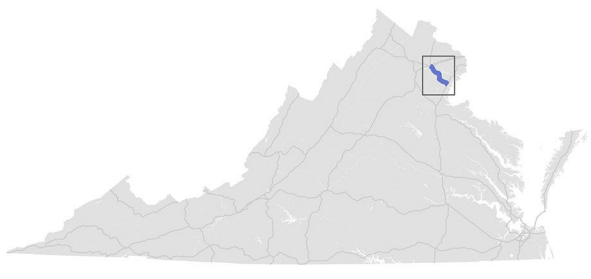
Number of Lanes (both directions)

- 2
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 12
- Primary facility



Future Projects

- Reconstruction with added capacity
- Safety improvements
- Primary facility



Segment G1 begins at US 1 in Prince William County and progresses northwest to the junction of Virginia Route 234 and I-66, serving Prince William County, as well as the cities of Manassas and Manassas Park. The segment travels through the Northern Virginia portion of the Metropolitan Washington MPO Area. Segment G1 functions as a connection from I-95 to I-66 and the Virginia Inland Port. The segment also serves as an important corridor for local commuter travel in Northern Virginia.

Highway Facilities: VA 234 is primarily a four-lane local access road, connecting I-66 and I-95, as well as local residential and commercial areas of Prince William County. Route 28 provides parallel service to the north of Segment G1, and Route 234 Business provides more local access in and around the City of Manassas.

Transit Services: Transit services provide connections from Segment G1 within Northern Virginia and Washington DC including VRE service at Woodbridge and Manassas, commuter bus services provided by PRTC, and private service providers. Amtrak and Greyhound provide service from Manassas and Woodbridge. Park-and-Ride locations are available, especially near Woodbridge.

Rail Facilities: There are no rail facilities that parallel the segment, though Norfolk Southern's Crescent Corridor does intersect the segment at Manassas.

Port Facilities: Segment G1 provides a connection from I-95 to Virginia Inland Port via I-66.

Airport Facilities: There is one reliever airport located in Segment G1.

Major planned and future projects include:

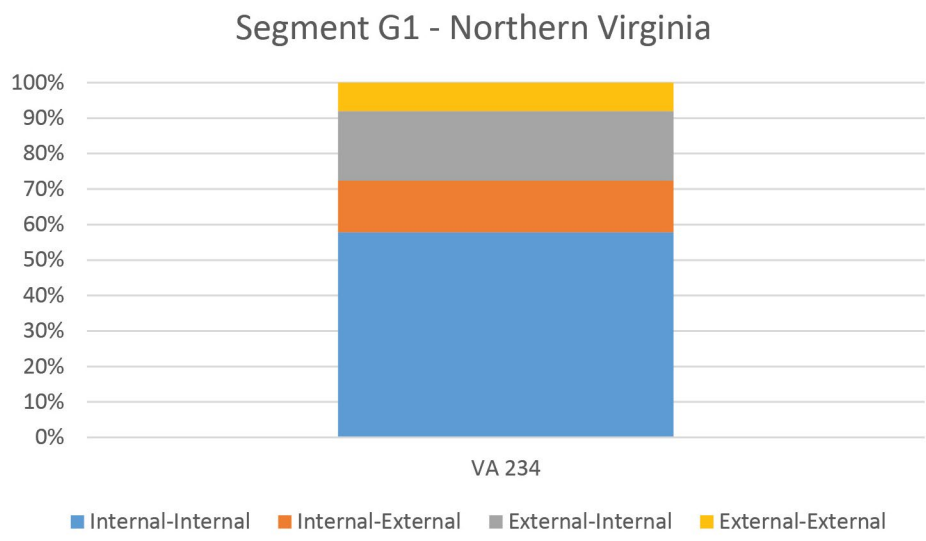
- Pedestrian improvements including 1,300 feet of sidewalk with curb and gutter between Four Seasons Drive and Fortuna Center Plaza on Route 234;
- Widening of Minnieville Road between Route 234 and Route 643 from two lanes to a four-lane divided urban section with pedestrian facilities;
- Realignment of Purcell Road between Route 234 and Vista Brooke Drive. Providing safety and drainage improvements at the curve just east of Vista Brooke Drive on an existing two-lane section of road;
- Widening of Nokesville Road (Route 28) from four to six lanes underneath Route 234; and
- Route 234 bypass interchange construction at relocated Balls Ford Road (Route 621). Balls Ford Road (Route 621) will also be widened.

Travel Demand

Passenger Demand

Segment G1 exists entirely within the Northern Virginia Area, and accommodates large amounts of traffic local to the region. This segment provides connections between multiple CoSS segments within Northern Virginia, including Segment H2, Segment I4 and Segment K3. While this segment provides flexibility and redundancy for intercity passenger traffic in or through Northern Virginia, it is not the primary route for any intercity traffic.

On Route 234 in Segment G1, 58 percent of travel is local traffic with both its origin and destination inside the Northern Virginia Area. An additional 35 percent of traffic in this segment has one end of the trip outside of Northern Virginia, including other areas within the Metropolitan Washington MPO Area (such as the District of Columbia and Maryland). Only eight percent of the travel is through traffic passing through the Northern Virginia Area.



Freight Demand

By truck, Segment G1 carried three million tons of freight worth $3 billion in 2012, and is estimated to carry four million tons of freight worth $5 billion in 2025. Truck freight traffic using Corridor G is mostly comprised of freight movements within Virginia, as 50 percent of truck freight tonnage on the corridor is intra-state traffic and just three percent of freight tonnage passes through the Commonwealth. Truck freight between Loudoun County and North Carolina accounts for more than ten percent of the total truck freight tonnage and 12 percent of the total value on the corridor. There are also significant truck freight flows between Fauquier County and Pennsylvania, accounting for five percent of the truck tonnage on Corridor G. An additional five percent of the truck tonnage on the corridor travels between Loudoun County and Chesterfield County in Virginia.

Truck Freight

Major Origins (by Tonnage)
1. Virginia (72% / 69%)
2. Loudoun County (26% / 19%)
3. North Carolina (9% / 9%)
4. Pennsylania (7% / 7%)
5. Maryland (4% / 6%)

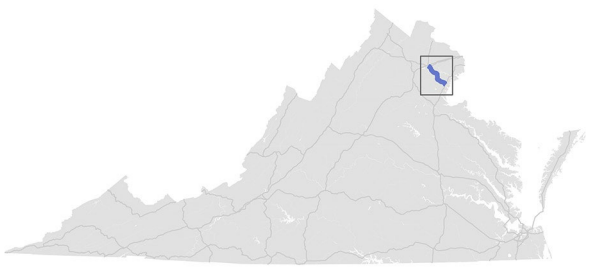
Corridor Tonnage Originating in Segment G1: 32% / 26%

Major Origin-Destination Pairs for Freight
Loudoun County and North Carolina
Culpeper County and Pennsylvania
Fauquier County and Pennsylvania
Loudoun County and Chesterfield County
Loudoun County and City of Richmond*

Percentages represent 2012 / 2025 values.
*Includes freight passing through the Port of Virginia.

Major Destinations (by Tonnage)
1. Virginia (72% / 77%)
2. Loudoun County (25% / 31%)
3. Pennsylvania (12% / 10%)
4. Prince William County (8% / 8%)
5. North Carolina (7% / 5%)

Corridor Tonnage Destined for Segment G1: 37% / 45%



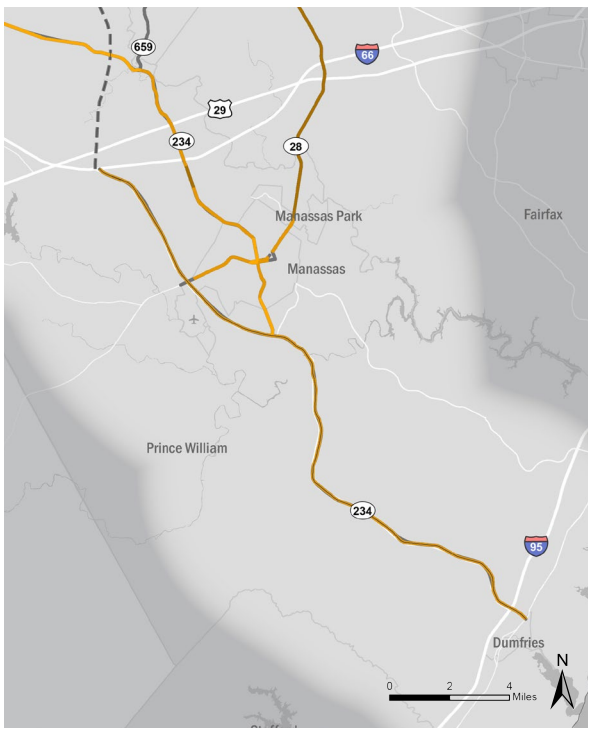
Traffic Conditions

Traffic Volume and AADT

Average daily traffic volumes along Route 234 in Segment G1 range from 24,000 to 45,000 vehicles, with the highest volumes occurring at either end of the segment near the interchanges with I-66 and I-95. By 2025, traffic volumes on Segment G1 are projected to increase along Route 234, bringing the average daily traffic volume up by 6,000 to 10,000 vehicles per day.

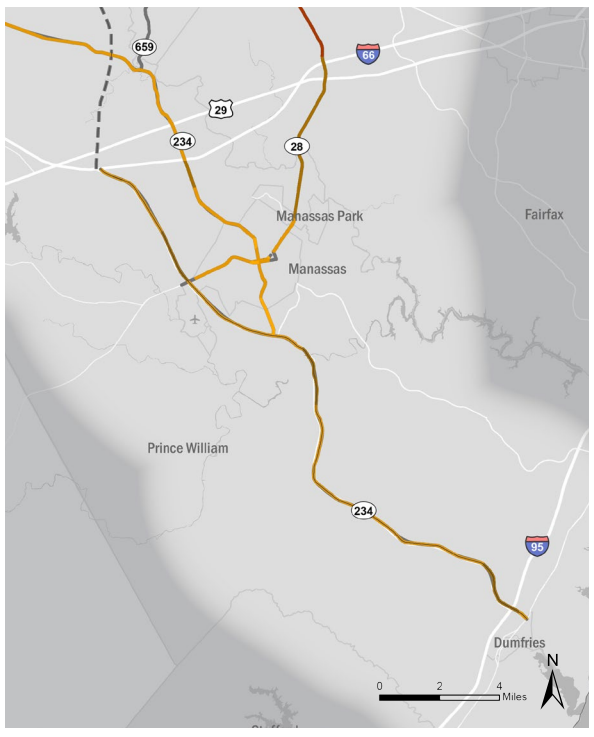
Traffic Volume 2014 (AADT)

- < 10,000
- 10,000 - 50,000
- 50,000 - 100,000
- 100,000 - 200,000
- > 200,000
- Primary facility



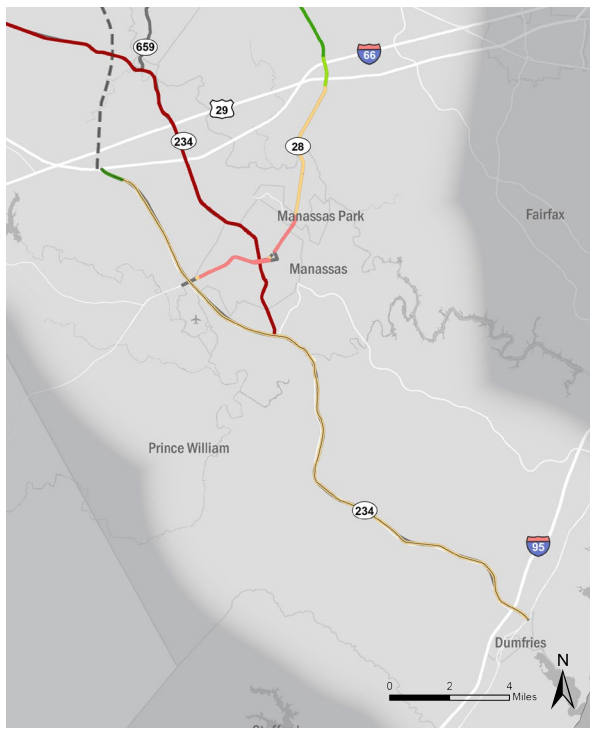
Traffic Volume 2025 (AADT)

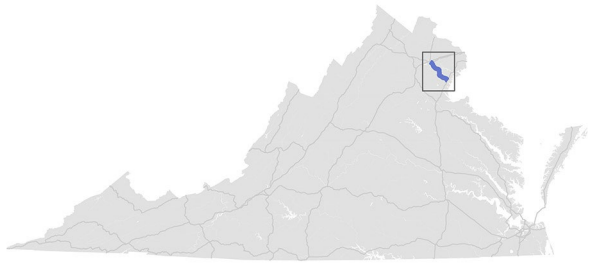
- < 10,000
- 10,000 - 50,000
- 50,000 - 100,000
- 100,000 - 200,000
- > 200,000
- Primary facility



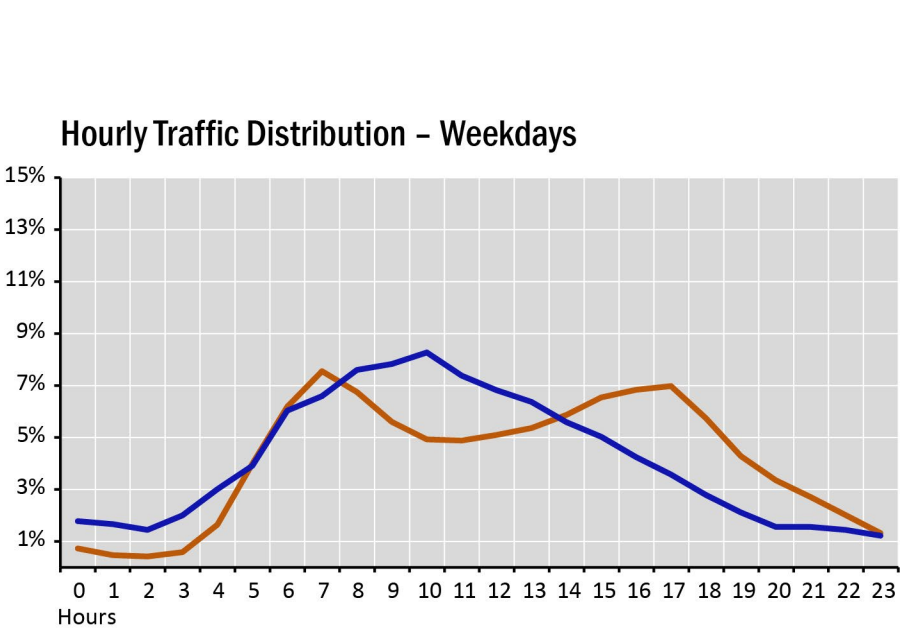
Change in Traffic Volume 2014 - 2025 (AADT)

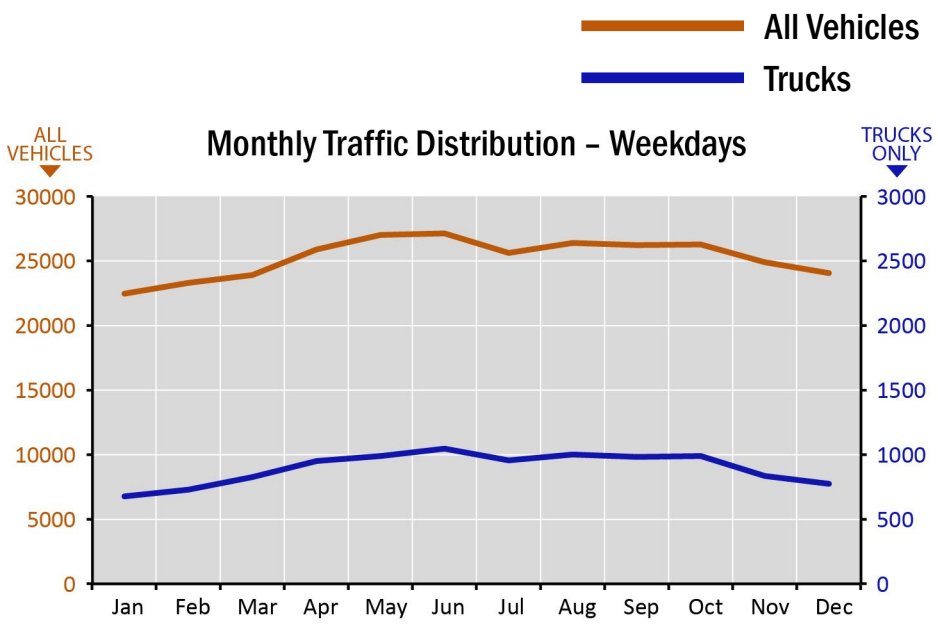
- Decreased
- 0 - 5,000
- 5,000 - 10,000
- 10,000 - 20,000
- > 20,000
- Primary facility

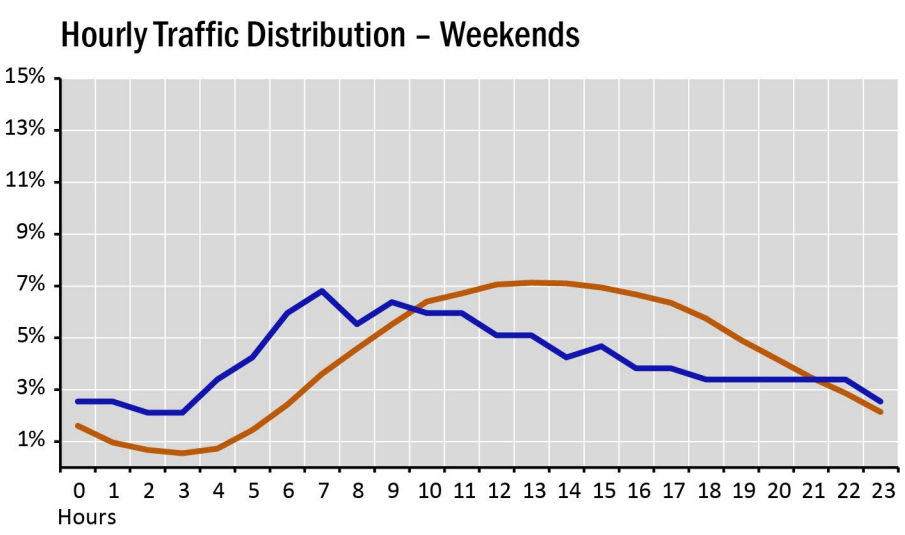


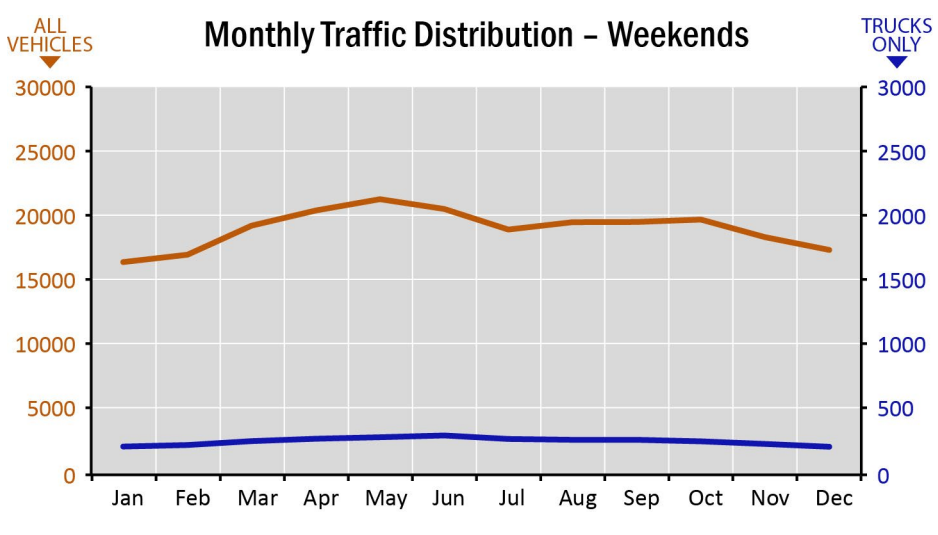


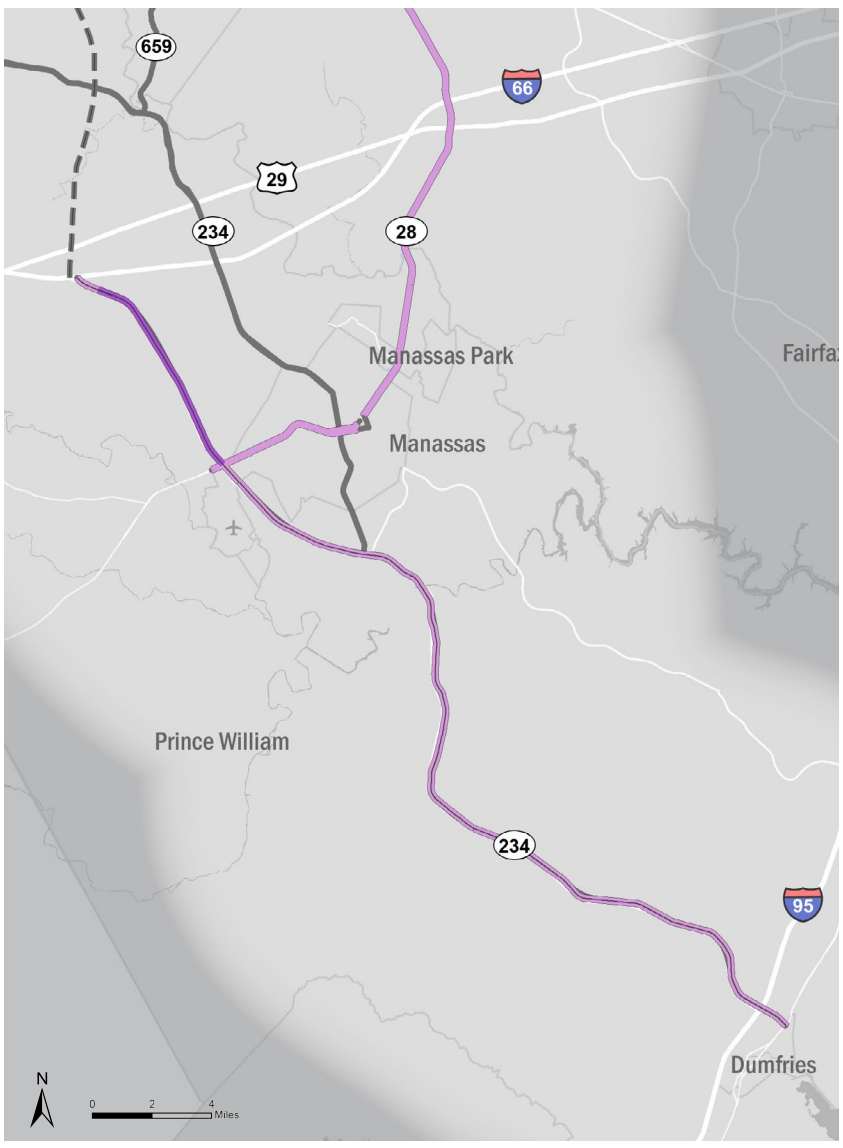
G1 SEGMENT PROFILE











Percent Heavy Trucks

- < 5%
- 5% - 10%
- 10% - 15%
- 15% - 20%
- > 20%
- Primary facility

Traffic Distribution

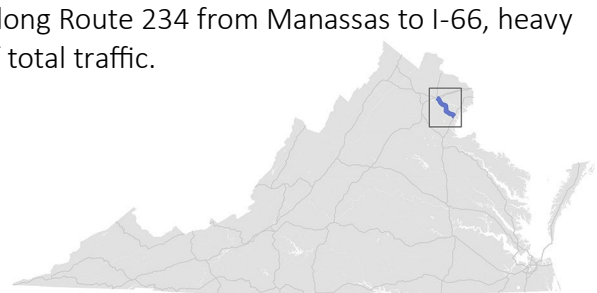
On average, traffic on Segment G1 is distributed throughout the day as shown in the graphs below.

Weekday traffic shows two peak periods over the course of the day, and the highest hourly traffic occurs between 7 and 8 a.m. which accounts for 7.6 percent of daily traffic and a less busy evening peak between 5 and 6 p.m. accounting for 7.0 percent of daily traffic. The combined weekday traffic in the two peak periods (from 6 to 10 a.m. and from 3 to 7 p.m.) accounts for 52 percent of total daily traffic. Peaking patterns for truck traffic are different from other traffic, with a peak hourly flow of 8.3 percent of daily traffic occurring between 10 and 11 a.m. Weekend traffic patterns are different from the typical commute patterns, showing a single peak during the middle of the day with the peak hour flow between 1 and 2 p.m. (7.1 percent of daily traffic) for all traffic. Weekend truck traffic decreases throughout the day, and the peak hourly traffic occurs from 7 to 8 a.m. (6.8 percent of daily traffic).

Weekday traffic volumes on Segment G1 vary by as much as 21 percent throughout the year, with the highpoint in June (around 27,000 vehicles per day) and the low point in January (around 22,000 vehicles per day). Truck volumes vary significantly throughout the year, with the June high (around 1,000 vehicles per day) 55 percent higher than the January low (around 700 vehicles per day). Weekend traffic levels also vary over the course of the year, and the highest levels of weekend traffic (May, around 21,000 vehicles per day) are 30 percent higher than January levels (around 16,000 vehicles per day). Truck volumes account for a relatively small portion of traffic on Segment G1 (three percent of weekday daily traffic and one percent of weekend daily traffic); traffic conditions are much more responsive to variations in automobile traffic than truck traffic.

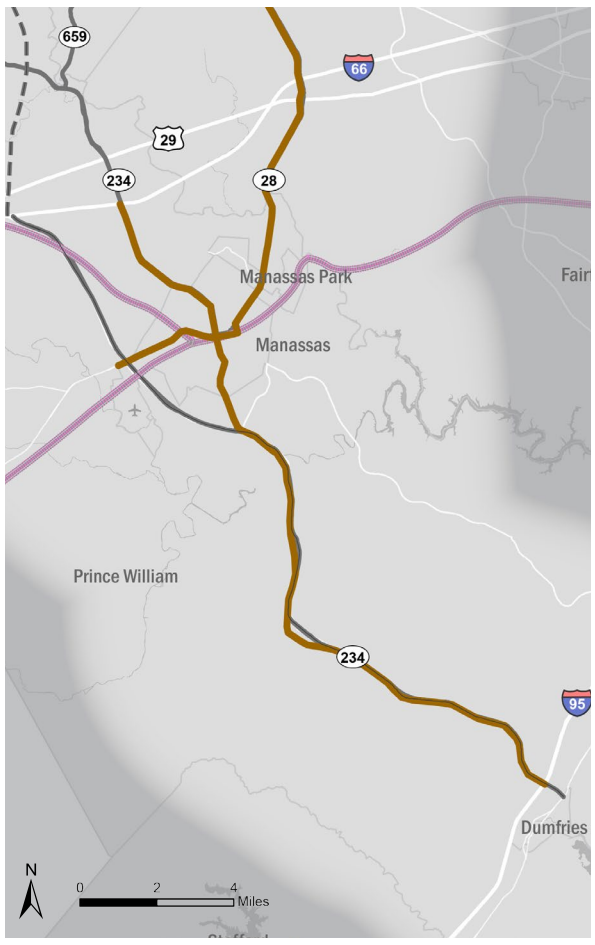
Truck Volume

In Segment G1, heavy trucks account for three percent of total traffic along Route 234 from Dumfries to Manassas. Along Route 234 from Manassas to I-66, heavy trucks account for seven percent of total traffic.



G1 SEGMENT PROFILE

Annual Freight by Tonnage, 2012

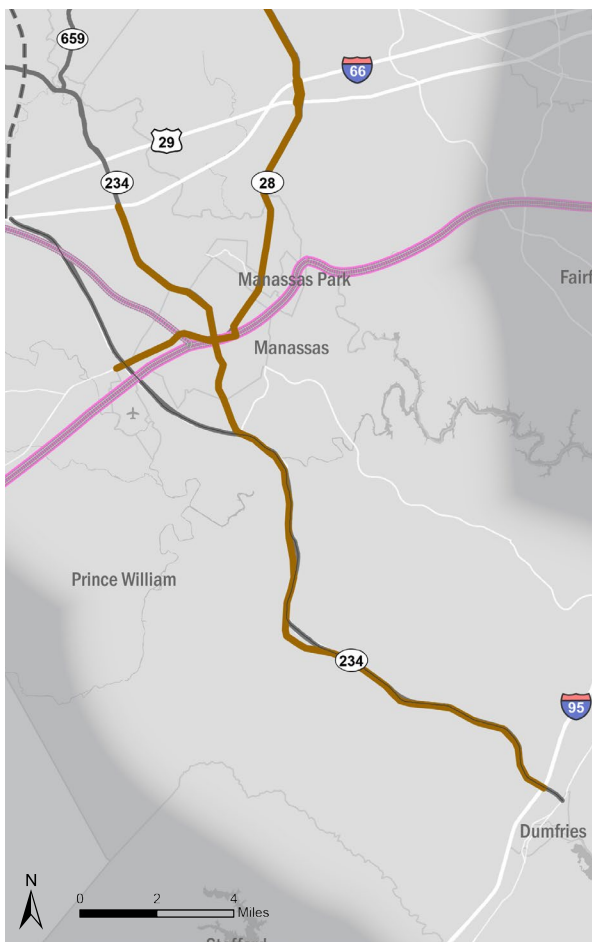


Freight Flows

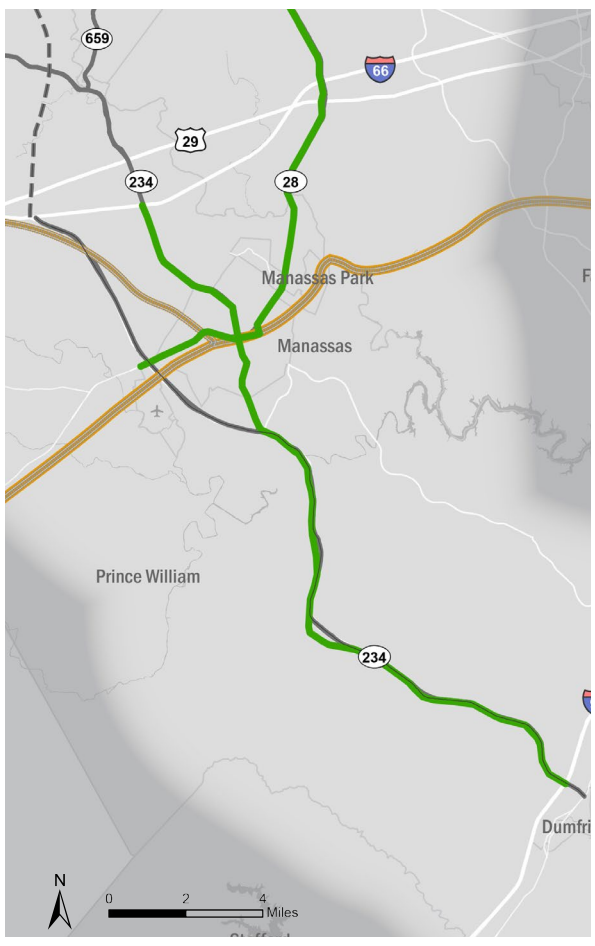
In Corridor G, freight is moved primarily by truck, in terms of both tonnage and value. In Segment G1, rail only provides a parallel facility for trucks between Manassas and I-66. Through Segment G1, more than two million tons (80 percent) of freight is moved by truck, compared to 607,000 tons by rail. In terms of freight value, $2.5 billion (99.7 percent) of freight value travels by truck, compared to $5 million by rail. On average, a ton of freight traveling through Segment G1 by truck is worth $1,009 while a ton of freight traveling by rail is worth $9. By 2025, both rail and truck freight tonnages and total values in Segment G1 are expected to increase, but the relative percentages of tonnage and value moved by truck are expected to remain nearly the same. Value per ton of freight by truck is expected to grow by 2025, with an average of $1,386 per ton, while value per ton of freight by rail is predicted to remain the same.

At the southern end of Segment G1, near the junction with I-95, no parallel rail facility exists. Trucks carry a total of 2.5 million tons of freight, worth $2.5 billion. On average, a ton of freight traveling through the southern end of G1 is worth $1,007. By 2025, truck freight tonnage and value is expected to increase, as is value per ton, to an average of $1,385.

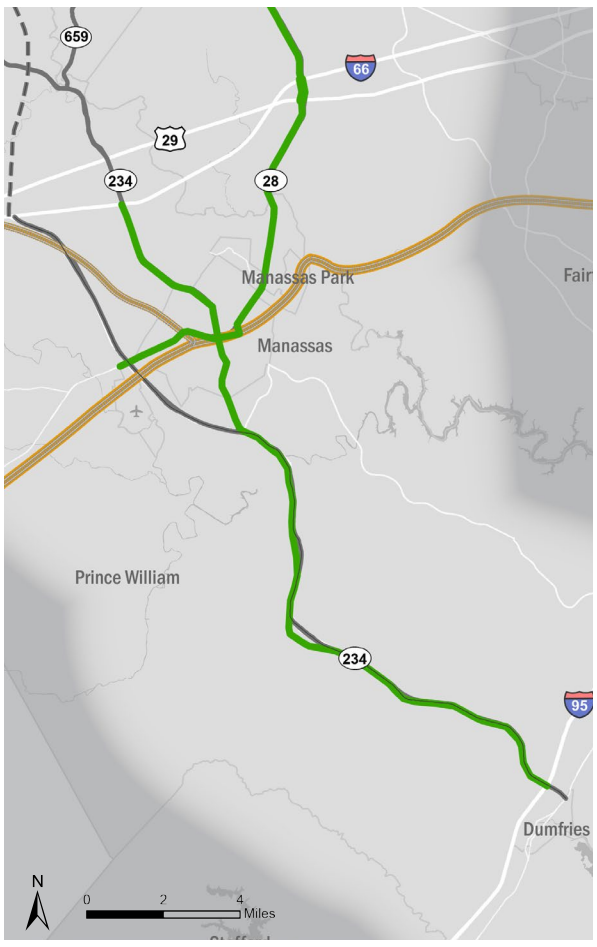
Annual Freight by Tonnage, 2025



Annual Freight by Value, 2012



Annual Freight by Value, 2025



Truck Freight (in tons)

- < 10M
- 10M - 25M
- 25M - 50M
- 50M - 100M
- > 100M
- Primary facility

Rail Freight (in tons)

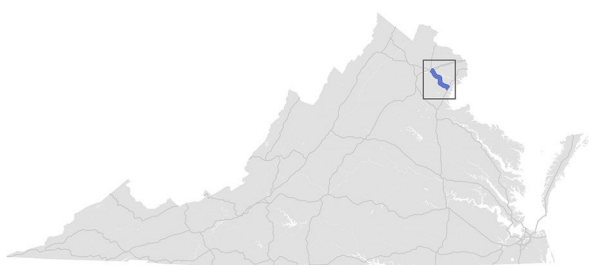
- < 10M
- 10M - 25M
- 25M - 50M
- 50M - 100M
- > 100M
- Primary facility

Truck Freight (in value)

- < $10B
- $10B - $50B
- $50B - $100B
- $100B - $200B
- > $200B
- Primary facility

Rail Freight (in value)

- < $10B
- $10B - $50B
- $50B - $100B
- $100B - $200B
- > $200B
- Primary facility



Redundancy and Mode Choice

Comparable Travel Options

Manassas to Dale City

Inter-City Bus	Train
30 Trips per Day 0:50 Travel Time $8 Est. Cost	0 Trips per Day 0:00 Travel Time $0 Est. Cost

Auto

Via Rte. 234: 0:30 Travel Time $10 Est. Cost

Fredericksburg to Leesburg

Inter-City Bus	Train
0 Trips per Day 0:00 Travel Time $0 Est. Cost	0 Trips per Day 0:00 Travel Time $0 Est. Cost

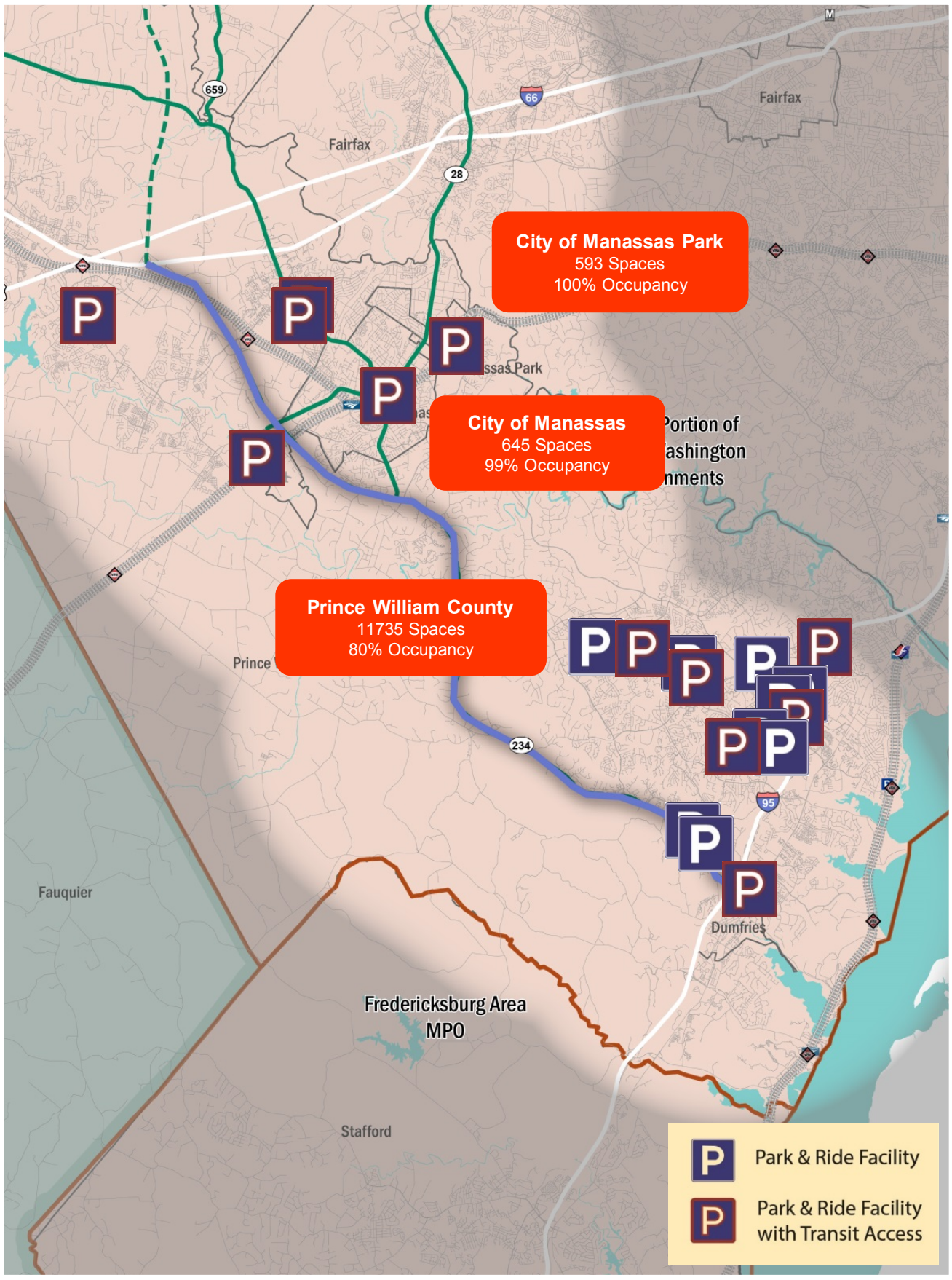
Auto

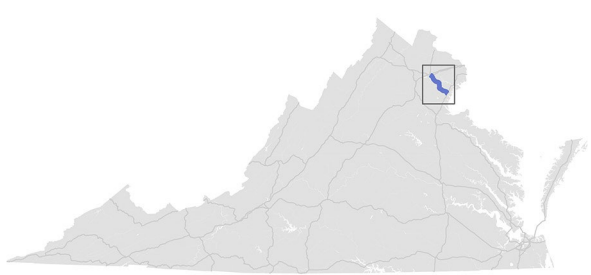
Via Rte. 234: 1:35 Travel Time $43 Est. Cost

Passenger trips on Segment G1 of the North-South Corridor have limited travel options, both in terms of travel path and mode choice. US 234 does not have a parallel highway facility for the full length of Segment G1, although alternatives are available north of the City of Manassas. Based on the 2014 federal standard mileage rate of 56 cents per mile, trips along the corridor would be more expensive by automobile than by the other available modes, such as by bus. Bus service, offered by PRTC, provides access to locations within the segment, but does not currently offer service to the rest of the corridor. Amtrak, Greyhound, and VRE have stations at Woodbridge and Manassas, though these services provide a connection to Washington DC and do not facilitate travel within the corridor.

Park-and-Ride

Within Segment G1, commuters can utilize many Park-and-Ride locations in Prince William County, as well as commuter bus service to Northern Virginia and Washington DC from PRTC. Prince William County has a high number of Park-and-Ride locations (30) and spaces (11,735). The Park-and-Ride locations in Prince William County are heavily used, and the utilization rate of 80 percent is higher than the statewide average of 76 percent.





G1 SEGMENT NEEDS

Safety

Performance Metrics

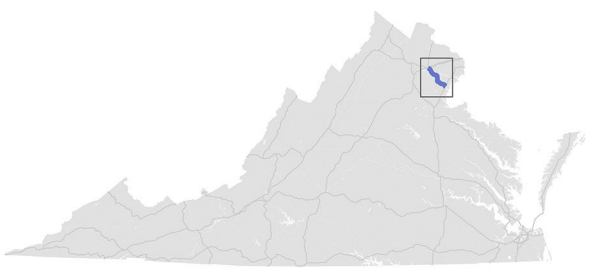
Number of Severe Crashes	266
Severe Crashes/Million VMT	8.4
Number of Railroad Crashes	1

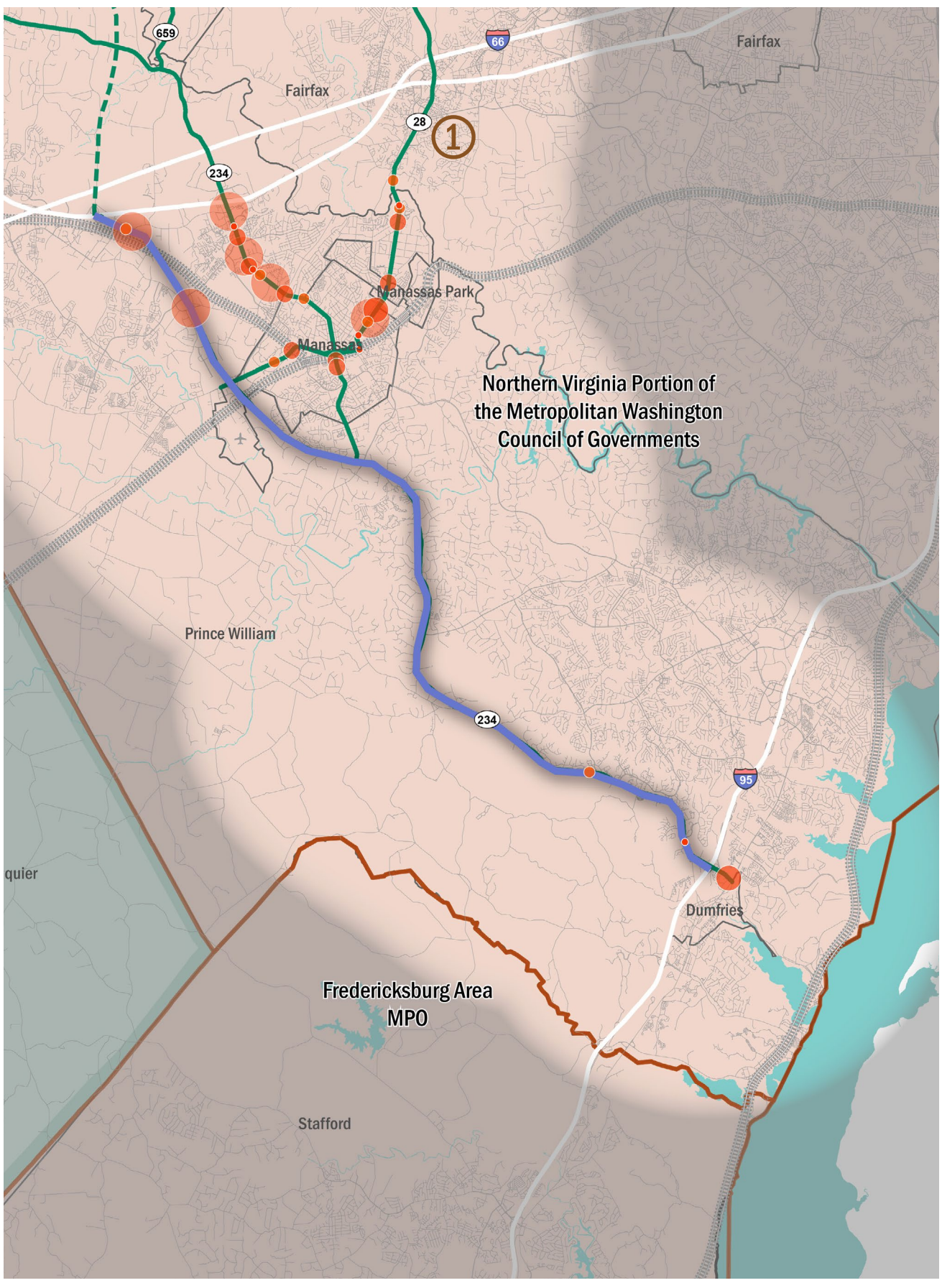
Between 2010 and 2012, 266 severe crashes occurred on Segment G1, resulting in the highest crash rate by far among CoSS segments in the Commonwealth. There are several areas along Segment G1 with high concentrations of severe crashes. Near the intersection of Route 234 (Dumfries Road) and US 1 (North Fraley Boulevard), there were 42 severe collisions. In Manassas, along Route 234 Business (Grant Avenue), 22 incidents occurred within a 0.2-mile stretch between Prince William Street and Byrd Drive. The largest number of crashes, 140, occurred on Sudley Road, south of I-66, over a distance of approximately three miles between Balls Ford Road and Digges Road. Of the 140 crashes, 100 occurred at intersections: 27 of these occurred at Balls Ford Road, 23 took place at Lomond Drive, and 21 happened at Rixlew Lane. On Route 234 (Prince William County Parkway), 21 collisions occurred at the intersection with Wellington Road, and 30 crashes occurred over 0.44 miles at and near the intersection with Balls Ford Road.

Fatality and Injury Crashes (2010 - 2012)

- < 5
- 5 - 10
- 11 - 15
- 16 - 20
- > 20

Railroad Incidents/Accidents per County (2011-2014)



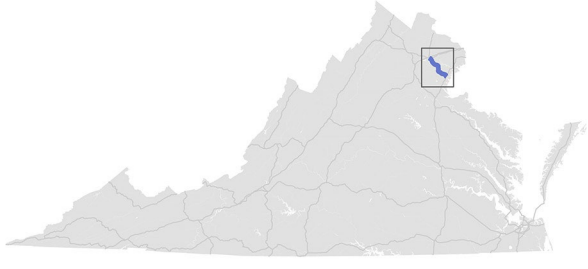


G1 SEGMENT NEEDS

Congestion

Performance Metrics

Person Hours of Delay per Mile	99
Freight Ton Hours of Delay per Mile	19.4K



Passenger Delays

While total passenger delays along Segment G1 are moderate with respect to other CoSS segments, this segment ranks as one of the most highly congested segments for passenger traffic on a per-mile basis, with nearly 100 person-hours per mile of delay. There are significant passenger delays in excess of 100 person-hours per mile in a number of locations:

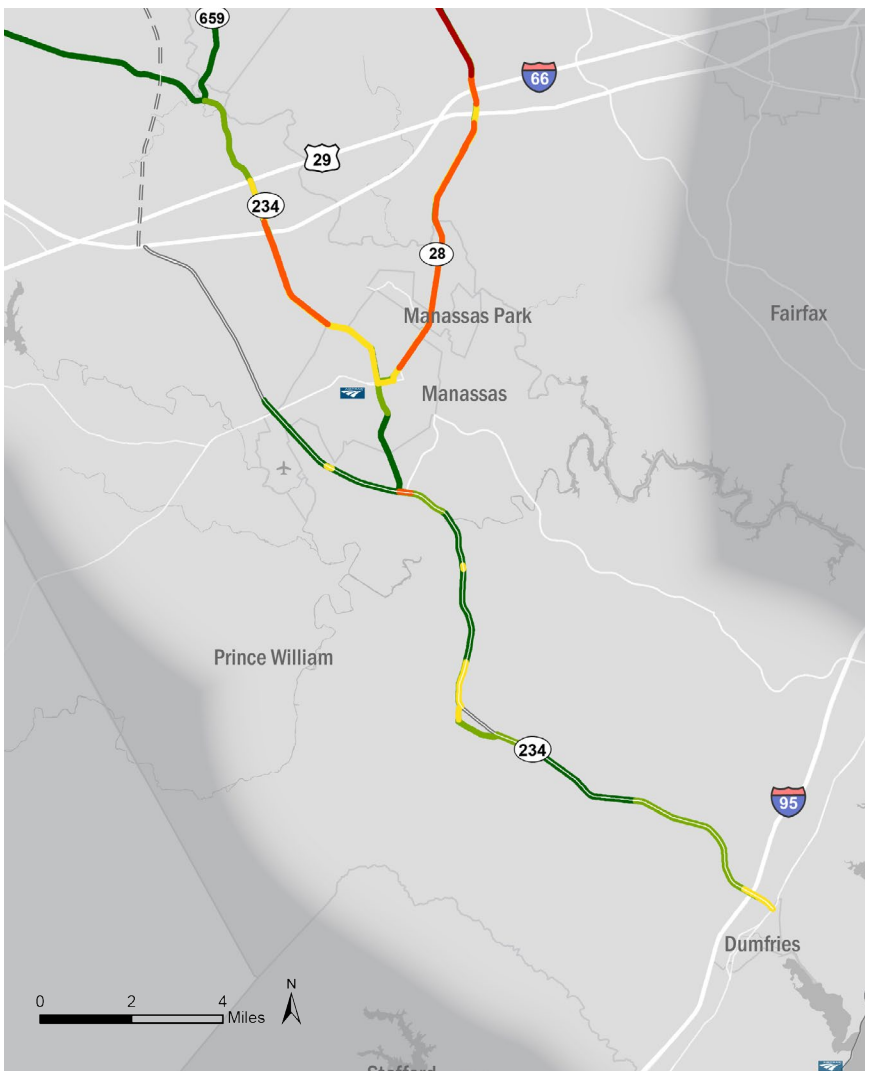
- Route 28 east of Route 234 Business in Fairfax and Prince William Counties and the Cities of Manassas and Manassas Park;
- Route 234 Business between Route 28 and US 29 in Manassas and Prince William County;
- Various locations on Route 234 in Prince William County between Route 28 and Bristow Road (Route 619);
- Route 234 at the intersection with Route 234 Business in Prince William County; and
- Route 234 between I-95 and US 1.

Peak-period passenger delays account for 38 percent of daily congestion, slightly less than the average peak-period congestion share for passengers among CoSS segments.

Freight Delays

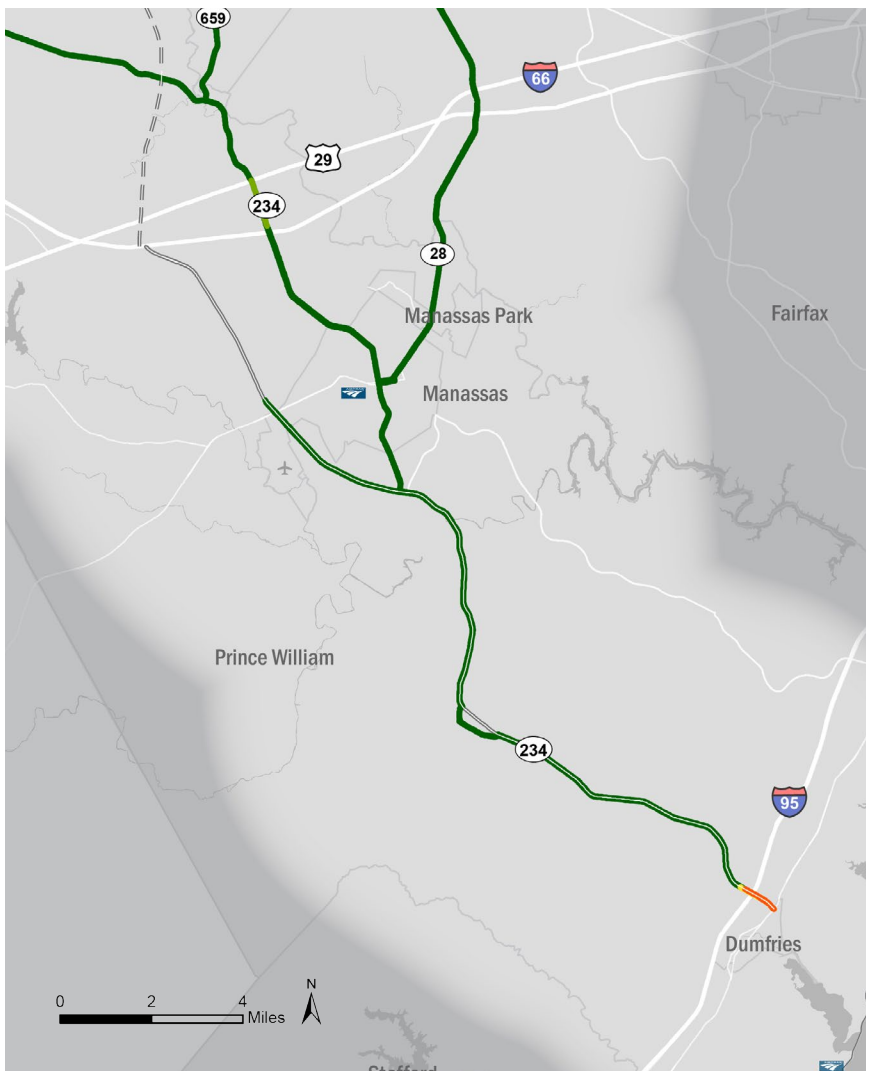
Freight delays along Segment G1 are moderate with respect to other CoSS, with nearly 20,000 ton-hours per mile of delay, although freight congestion is not nearly as severe as passenger congestion for this segment. In general, freight delays along the segment do not exceed 250,000 ton-hours per mile, with the exception of on Route 234 between I-95 and US 1. Peak-period freight delays account for 47 percent of daily congestion, which is higher than the average peak period congestion share for freight among CoSS segments.

Daily Person Hours of Delay Per Mile



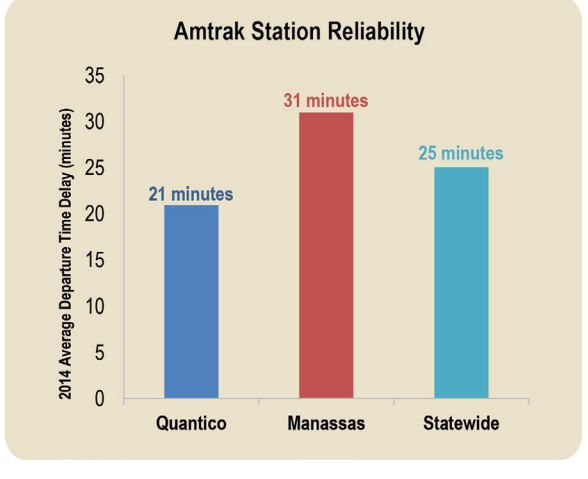
- < 50
- 51 - 100
- 101 - 250
- 251 - 500
- > 500

Daily Freight Ton Hours of Delay Per Mile



- < 100,000
- 100,001 - 250,000
- 250,001 - 500,000
- 500,001 - 1,000,000
- > 1,000,000

Reliability



Weekday Peak Reliability

Reliability of travel during the peak period on a typical weekday on Segment G1 ranges from 0.05 to 0.98 in terms of reliability index, with an average value of 0.22. While this segment has a peak period reliability index much higher than average for the CoSS segments statewide, only a short segment on Route 234 near Bristow Road in Prince William County has a reliability index value exceeding the statewide threshold.

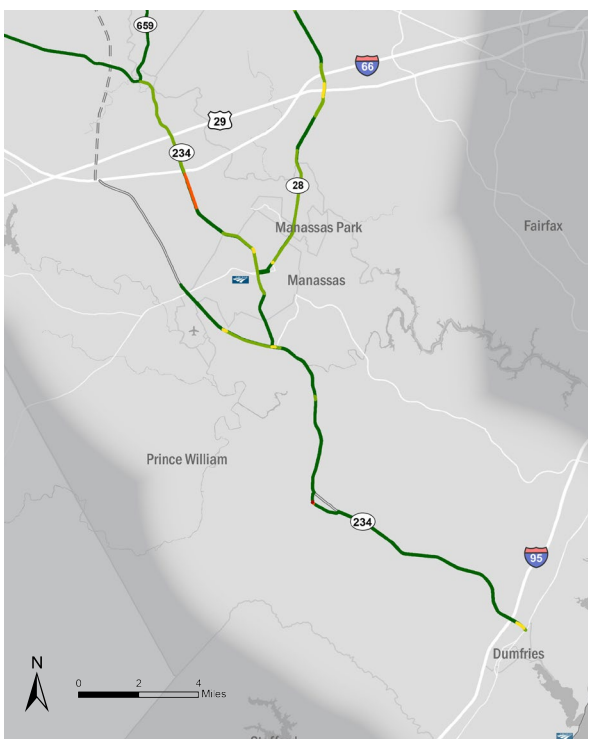
Weekday Reliability

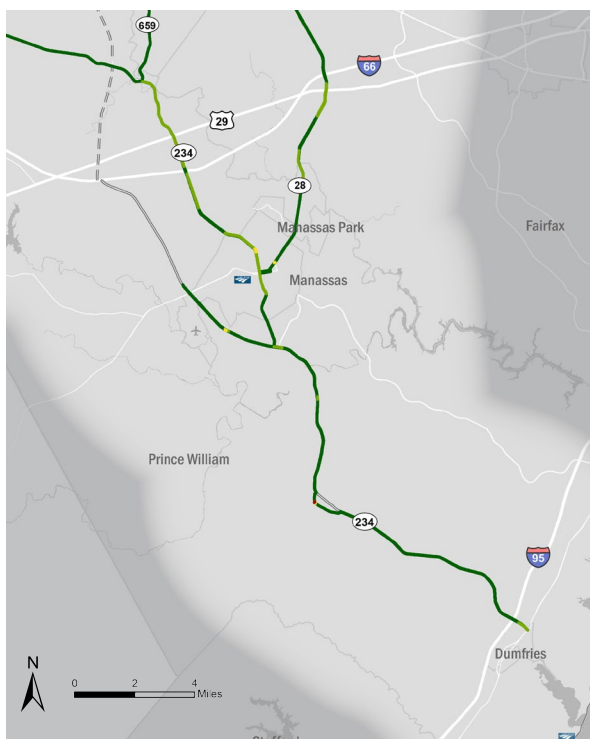
Reliability of travel during a typical weekday ranges from 0.04 to 0.82 in terms of reliability index, with an average value of 0.19. Locations where the weekday reliability index exceeds the statewide threshold include:

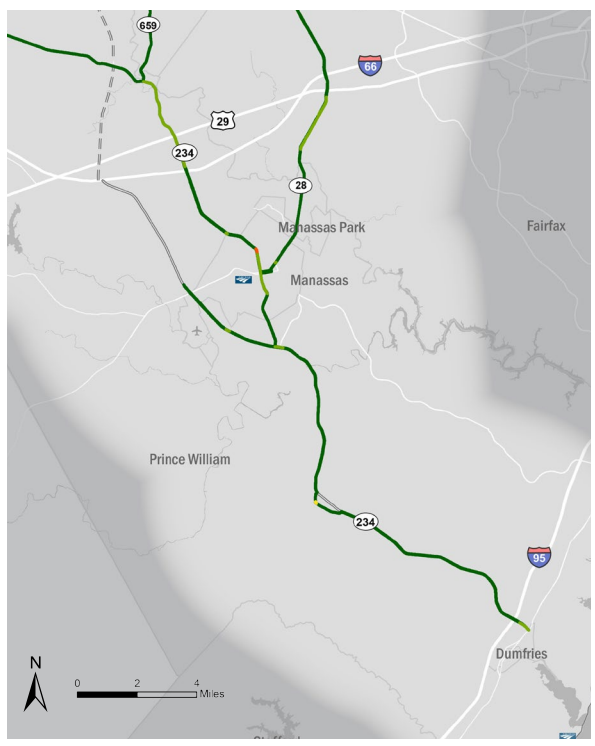
- Route 234 near Bristow Road in Prince William County;
- Route 234 near Clover Hill Road in Prince William County;
- Route 234 Business at the intersection of Sudley Road and Grant Avenue in the City of Manassas; and
- Route 28 near the intersection with Sudley Road in the City of Manassas.

Weekend Reliability

Reliability of travel during a typical weekend ranges from 0.01 to 0.64 in terms of reliability index, with an average value of 0.17. While this segment has a weekend reliability index much higher than average for the CoSS segments statewide, only a short segment on Route 234 Business near the intersection of Sudley Road and Grant Avenue in the City of Manassas has a reliability index value exceeding the statewide threshold.





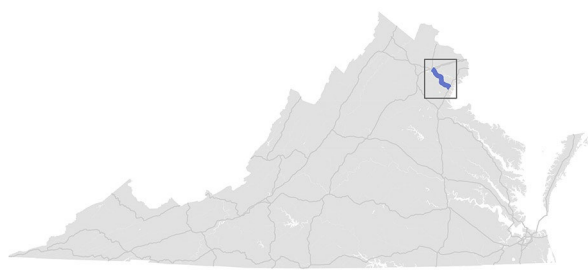


Reliability Index

- < 0.2
- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- > 0.8
- Primary facility (in white)

Statewide reliability index thresholds have been set for weekday peak, weekday and weekend travel to assess the reliability of travel on each segment on all corridors of statewide significance. A higher reliability index indicates that travel times are more unreliable. The following are the reliability index thresholds:

- Weekday Peak - 0.80
- Weekday - 0.40
- Weekend - 0.60



Summary of Needs

Identified locations are approximate. See "Summary of Needs" table on the following page for details.

Mode Choice

Redundancy

Safety

Congestion

Bottlenecks

Reliability

F

E, K

J, D

I, N

G

A

H, Q

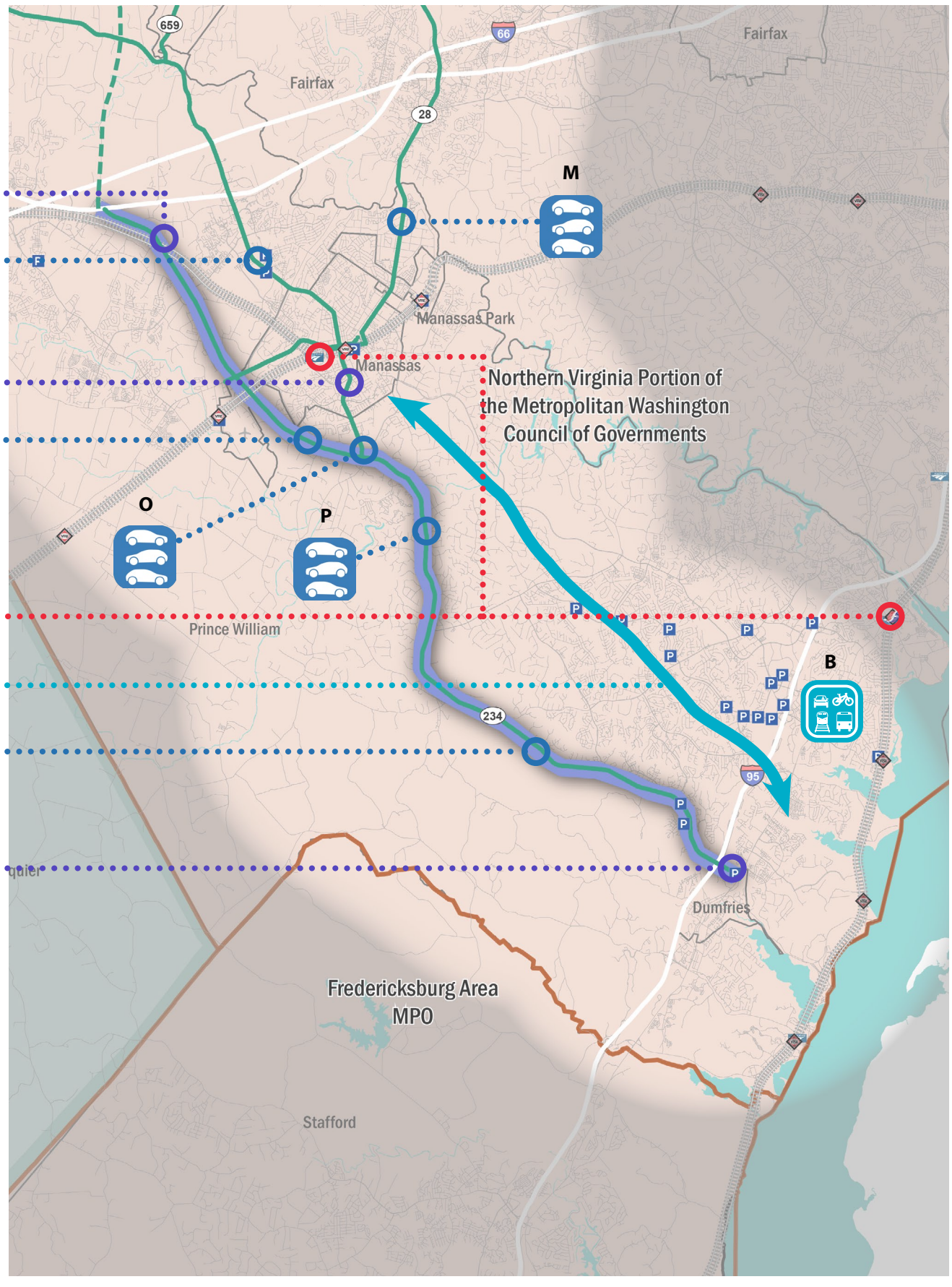
L, C

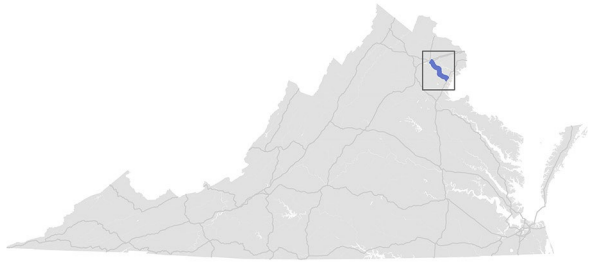
M

O

P

B





G1 SEGMENT NEEDS

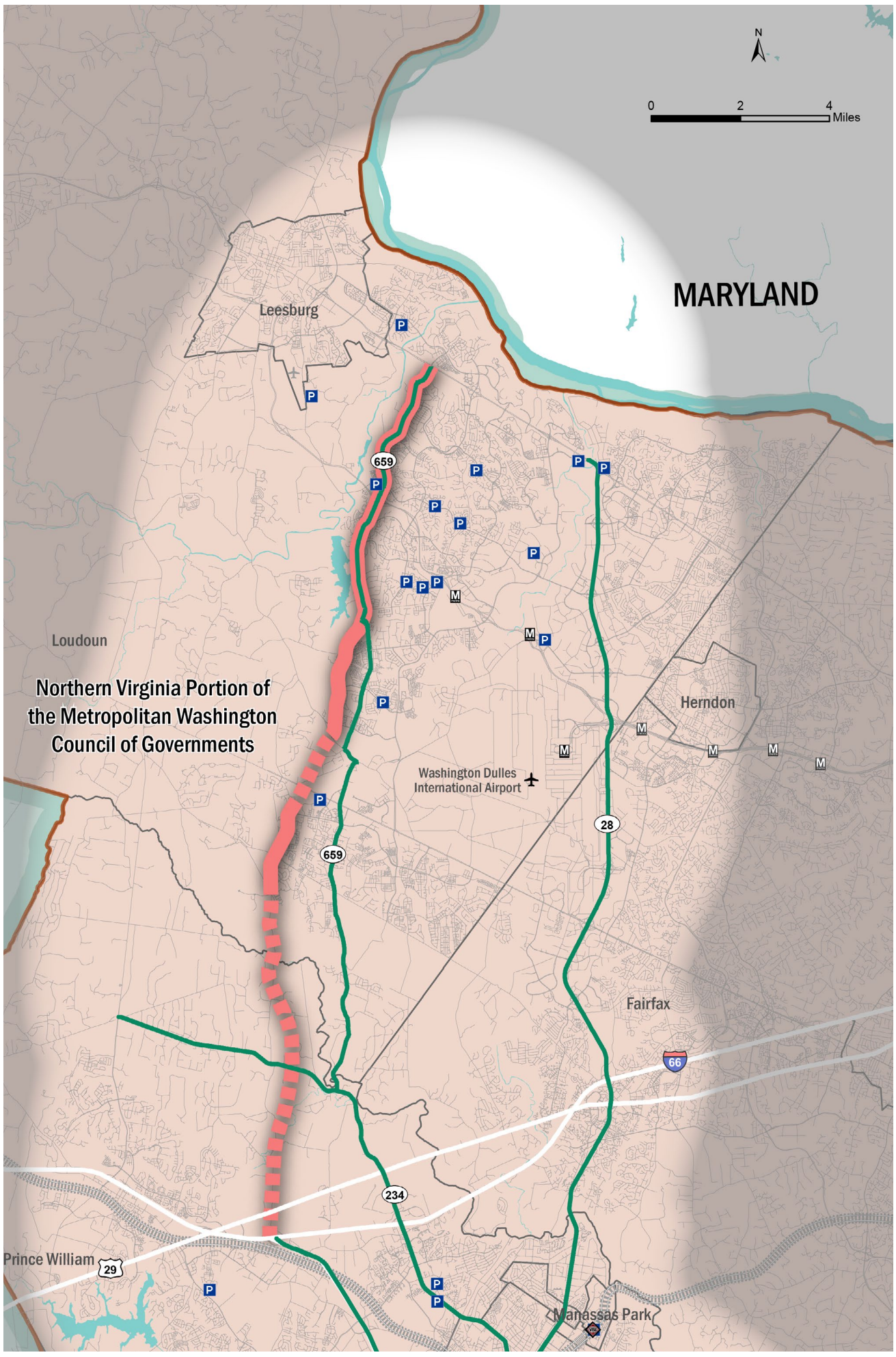
Summary of Needs - G1 Segment

A.		Passenger rail services do not facilitate travel within the corridor
B.		Park and Ride lots in Prince William County have higher utilization rates than statewide average
C.		Intersection of Dumfries Rd and US 1 in Dumfries: 42 severe crashes
D.		VA 234-Business between Prince William St and Byrd Dr in Manassas: 22 severe crashes
E.		Sudley Rd between Balls Ford Rd and Digges Rd in Manassas: 140 severe crashes
F.		Prince William County Pkwy at Wellington Rd and Balls Ford Rd in Manassas: 51 severe crashes
G.		Unreliable Amtrak service from Quantico (21 minutes average departure delay) and Manassas Station (31 minutes average departure delay) totaling over 13,800 person-hours of delay from this segment.
H.		Reliability issue at VA Route 234 and Independent Hill Drive in Prince William County
I.		Reliability issue at VA Route 234 (Prince William Parkway) and Clover Hill Road in Prince William County
J.		Reliability issue at VA Route 234 (Dumfries Road) and Wellington Road in Manassas
K.		Congestion on VA Route 234 (Grant Avenue/Sudley Road) between VA Route 28 and I-66
L.		Congestion issue on VA Route 234 at I-95 and US 1 in Dumfries
M.		Congestion on VA Route 28 between VA Route 234 (Grant Avenue) and I-66
N.		Congestion issue at VA Route 234 (Prince William Parkway) and Clover Hill Road in Prince William County
O.		Congestion issue at VA Route 234 (Prince William Parkway) and VA Route 234 (Dumfries Road) south of Manassas
P.		Congestion issue on VA Route 234 near Morningside Drive in Prince William County
Q.		Congestion issue at VA Route 234 and Independent Hill Drive in Prince William County

III. Segment G2

Corridor Segment G2 Components

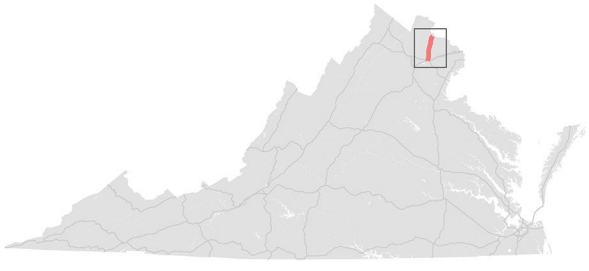
- Route 234
- Route 659
- Bi-County Parkway
- Northstar Boulevard
- Washington Dulles International Airport



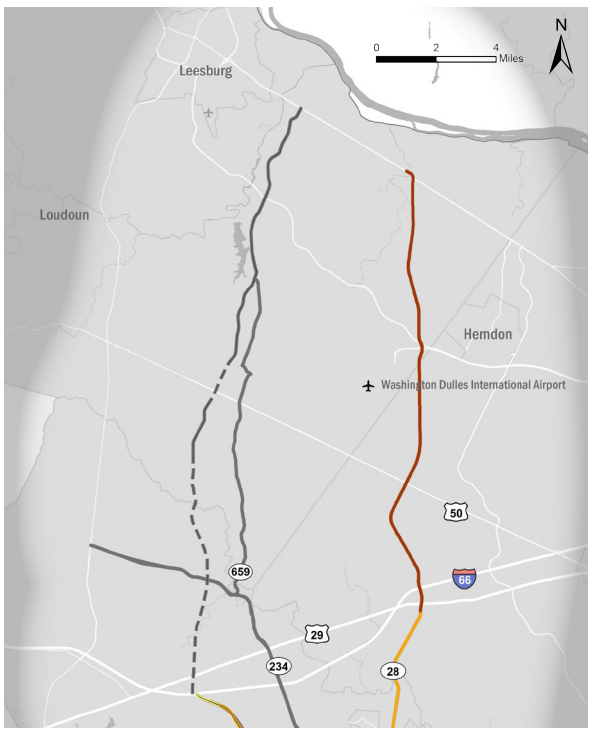
Segment G2

Corridor Component Road
Railroad
Airport Facility
Amtrak Facility
Greyhound Facility
VRE Facility
Metrorail Facility
Port Facility
Park & Ride Facility

MPO Area
Planning District Area



G2 SEGMENT PROFILE



Number of Lanes (both directions)

- 2
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 12
- Primary facility

Segment G2 begins at I-66 and progresses north to Route 7, serving Prince William and Loudoun Counties. The segment travels through the Northern Virginia portion of the Metropolitan Washington MPO Area.

With the construction of the Bi-County Parkway, Segment G2 is intended to provide an important connection for passengers and freight to Dulles International Airport, I-66, and I-95. Additionally, the segment is intended to serve local commuting traffic and provide a link between growing communities in the region, such as Ashburn, Brambleton, and Manassas.

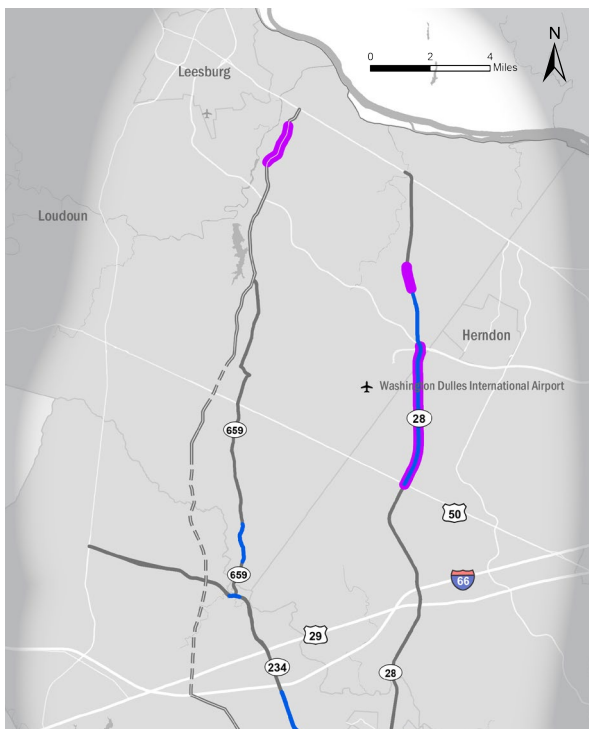
Highway Facilities: The Bi-County Parkway is a proposed limited-access highway providing connections between Dulles International Airport, I-66 and I-95, as well as to local residential and commercial areas of Prince William County and Loudoun County. Northstar Boulevard and Route 659 are roadway facilities that will be incorporated into the new Bi-County Parkway. Route 28 and US 15 serve as the closest parallel facilities to the Bi-County Parkway corridor in Segment G2.

Transit Services: Commuter bus services throughout the segment are provided by Loudoun County Transit, PRTC, and private service providers. VRE provides commuter rail within Northern Virginia and Washington DC nearby at Gainesville. The Washington Metropolitan Area Transit Authority (WMATA) is currently constructing the second phase of the Metrorail Silver Line, which will have a station in Ashburn that will provide transit access to the Metropolitan Washington region. There are numerous Park-and-Ride locations available, especially near Ashburn.

Rail Facilities: There are no rail facilities that parallel the segment.

Port Facilities: Segment G2 provides a connection from Dulles International Airport to I-95, as well as the Virginia Inland Port via I-66.

Airport Facilities: Dulles International Airport provides commercial air service in the segment and is the busiest airport in the Commonwealth in terms of both passengers and freight. There is also one reliever airport located in Segment G2.

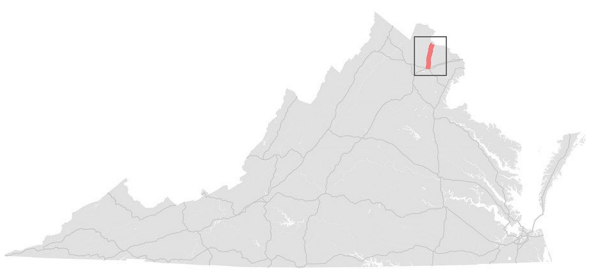


Future Projects

- Reconstruction with added capacity
- Safety improvements
- Primary facility

Major planned and future projects include:

- Widening of Belmont Ridge Road (Route 659) between Hay Road and Gloucester Parkway to four lanes; and
- Widening of Harry Byrd Highway (Route 7) at intersection with Belmont Ridge Road (Route 659).



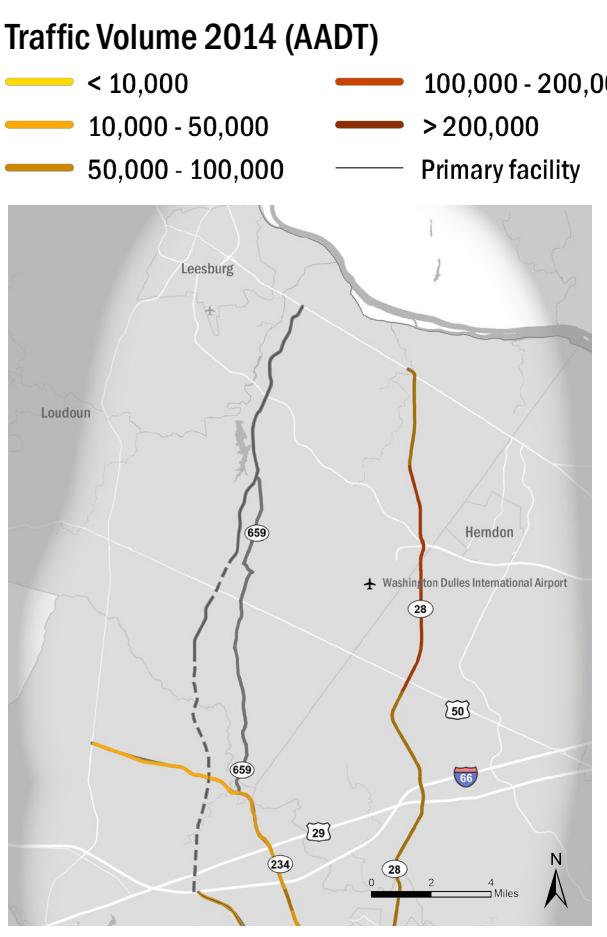
Travel Demand and Traffic Conditions

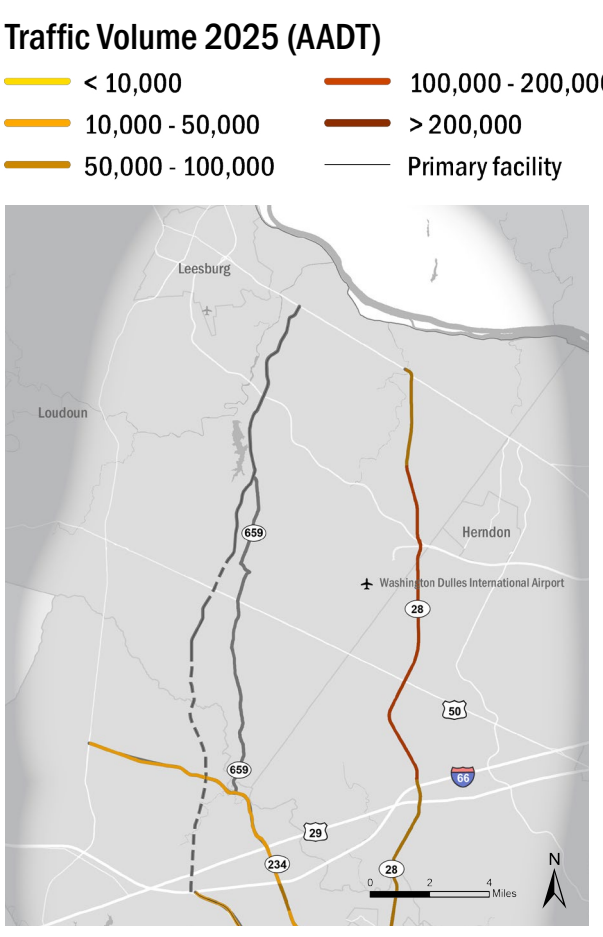
Passenger Demand

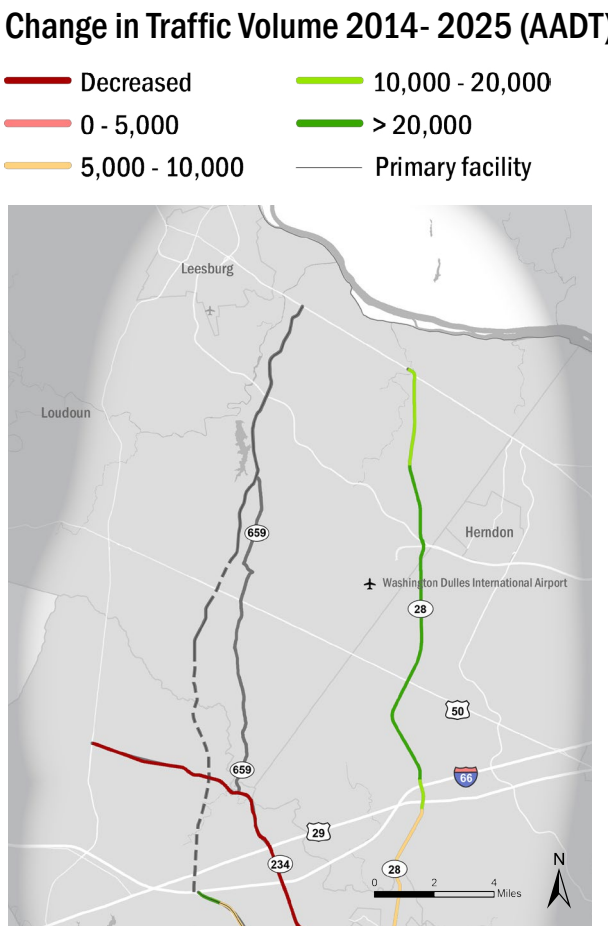
Currently, the primary facility of Segment G2 is not fully constructed, and few direct high capacity connections exist along this CoSS. Segment G2 is entirely within the Northern Virginia portion of the MWCOG region, and accommodates large amounts of traffic local to the region. Traffic analysis results on this specific segment are not yet available, but it can be reasonably assumed that it will perform similarly to Segment G1, which carries only eight percent of traffic passing through the Northern Virginia portion of the Metropolitan Washington MPO Area.

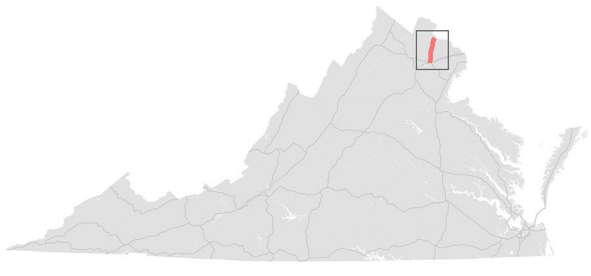
Traffic Volume and AADT

Segment G2 contains the proposed Bi-County Parkway, which has not been constructed. Other highways in the vicinity of the proposed location of the Bi-County Parkway include U.S. 15 and Route 28. Along U.S. 15 from U.S. 29 to Route 7 in Leesburg, average daily traffic volumes on most sections of highway range from 12,000 to 17,000 vehicles. The exception is the section along U.S. 15 from I-66 northward to Route 234; this section has an average daily traffic volume of 31,000 vehicles. By 2025, daily traffic volumes are projected to increase along U.S. 15 from U.S. 29 to U.S. 50 by 3,000 to 7,000 vehicles. By 2025, traffic volumes along U.S. 15 are projected to range from 9,000 to 38,000 vehicles per day. Current average daily traffic volumes along Route 28 from Manassas to Route 7 range from 45,000 to 134,000 vehicles, with the highest volumes near the junction with the Dulles Toll Road (Route 267). Along Route 28 north of I-66, traffic volumes are projected to increase greatly, ranging from 15,000 to 28,000 more vehicles per day. By 2025, traffic volumes along Route 28 north of I-66 are projected to range between 87,000 and 157,000 vehicles per day.



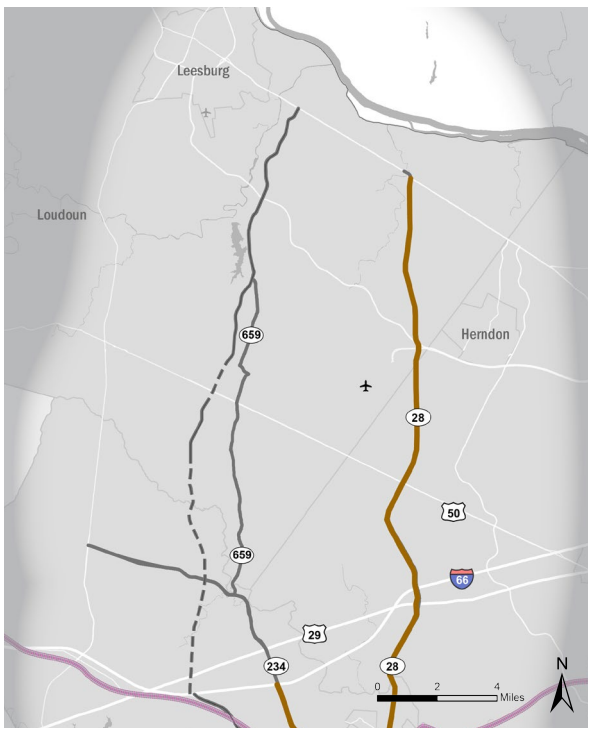






G2 SEGMENT PROFILE

Annual Freight by Tonnage, 2012



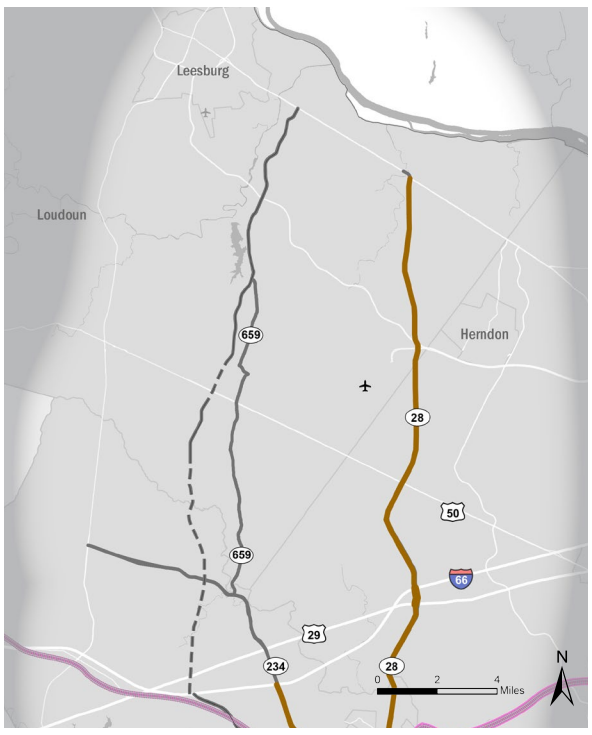
Freight Flows

In Segment G2, freight moves along existing parallel roadways, US 15 and Route 28, as well as through the Dulles International Airport. The Bi-County Parkway, which in intended to become the segment's primary roadway in the future, has not yet been constructed and no parallel rail facility exists. Dulles International Airport accommodates 174 million tons of freight arriving and departing annually, in addition to its passenger service. Route 28 provides direct access to Dulles International Airport and trucks using Route 28 carry more than five million tons of freight, worth over $4 billion. US 15, located west of the proposed Bi-County Parkway, carries more than one million tons of truck freight worth $442 million. Trucks on Route 28 carry more valuable freight than on US 15, on average $810 per ton on Route 28 compared to $368 on US 15. This difference will be even more pronounced by 2025, when freight on Route 28 is estimated to be worth an average of $1,219 per ton in comparison to $392 per ton on US 15.

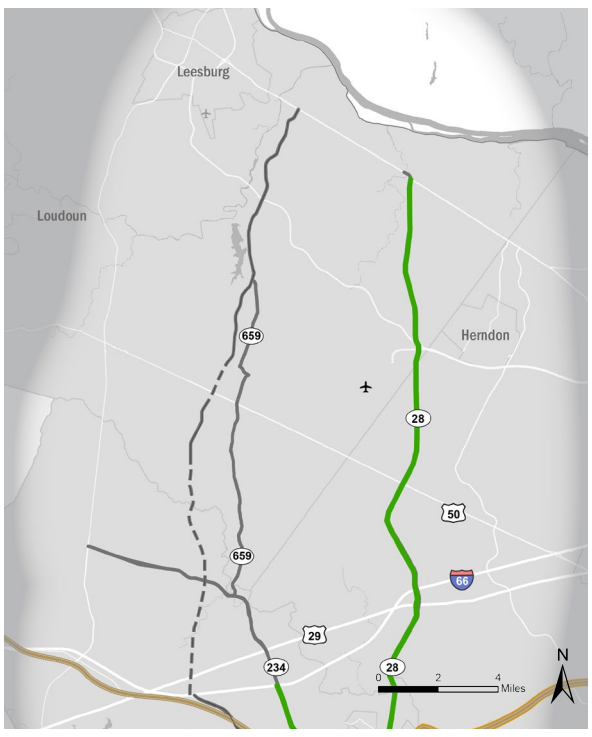
Truck Volume

Segment G2 includes the proposed Bi-County Parkway, which has not yet been constructed. Trucks account for a small percentage of daily traffic on Segment G2. On Route 28 in Fairfax and Loudoun Counties, trucks account for just one percent of daily traffic. On US 15 in Loudoun County, trucks comprise between four and six percent of daily traffic.

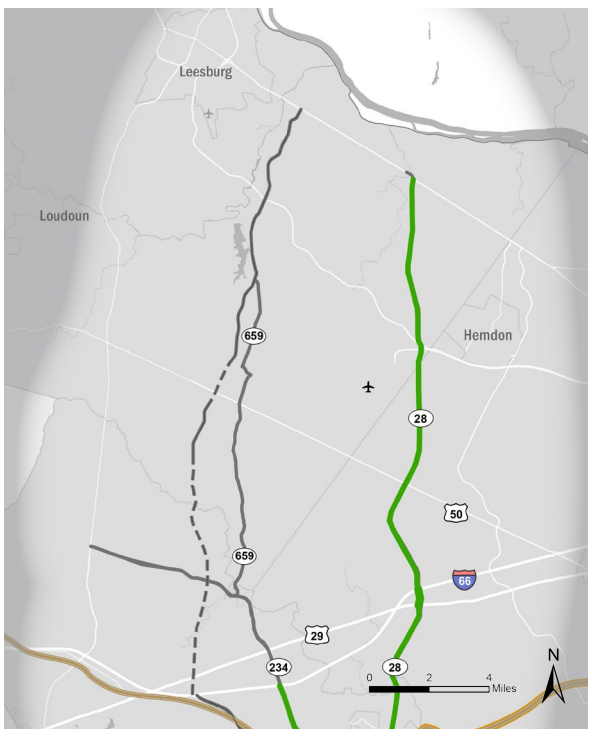
Annual Freight by Tonnage, 2025



Annual Freight by Value, 2012



Annual Freight by Value, 2025



Truck Freight (in tons)

- < 10M
- 10M - 25M
- 25M - 50M
- 50M - 100M
- > 100M
- Primary facility

Rail Freight (in tons)

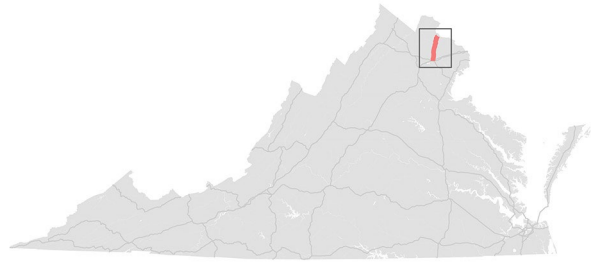
- < 10M
- 10M - 25M
- 25M - 50M
- 50M - 100M
- > 100M
- Primary facility

Truck Freight (in value)

- < $10B
- $10B - $50B
- $50B - $100B
- $100B - $200B
- > $200B
- Primary facility

Rail Freight (in value)

- < $10B
- $10B - $50B
- $50B - $100B
- $100B - $200B
- > $200B
- Primary facility



Redundancy and Mode Choice

Comparable Travel Options

Leesburg to Manassas

Inter-City Bus	*Train*
0 Trips per Day 0:00 Travel Time $0 Est. Cost	0 Trips per Day 0:00 Travel Time $0 Est. Cost

Auto

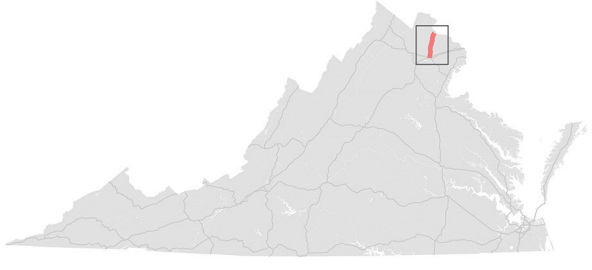
Via Rte. 234: 0:50 Travel Time $19 Est. Cost

Fredericksburg to Leesburg

Inter-City Bus	*Train*
0 Trips per Day 0:00 Travel Time $0 Est. Cost	0 Trips per Day 0:00 Travel Time $0 Est. Cost

Auto

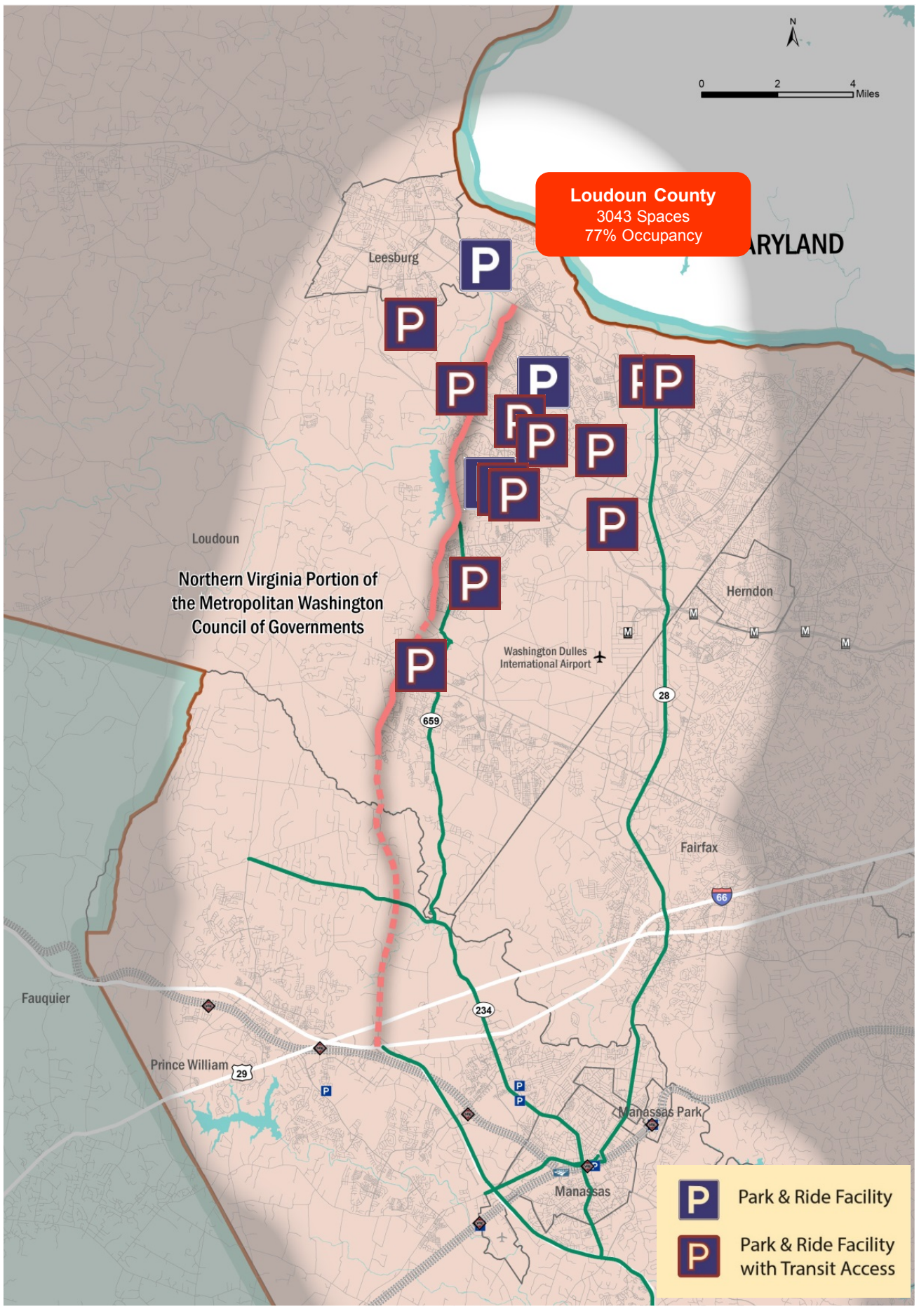
Via Rte. 234: 1:35 Travel Time $43 Est. Cost



Passenger trips on Segment G2 of the North-South Corridor currently have limited travel options, both in terms of travel path and mode choice. The proposed Bi-County Parkway has two parallel highway facilities, US 15 and Route 28, as it travels through Segment G2. No alternative modes provide connections within the segment or to the rest of the corridor, though transit service has been proposed as part of the implementation of the Bi-County Parkway. Current bus service, offered by PRTC, Loudoun County Transit, and VRE service at Gainesville provides connections to Washington DC but does not facilitate travel within the corridor. WMATA is currently constructing the second phase of the Metrorail Silver Line, which will have a station in Ashburn that will provide transit access to Northern Virginia, Washington DC, and Maryland, but not to the rest of the corridor. Dulles International Airport links passengers in the corridor to locations all over the world.

Park-and-Ride

Within Segment G2, commuters can utilize many Park-and-Ride locations, as well as commuter bus service to Northern Virginia and Washington DC from PRTC and Loudoun County Transit. Prince William County has a higher number of Park-and-Ride locations (30) and spaces (11,735) than Loudoun County, as well as a higher utilization rate of available spaces. However, within Segment G2, more of the Park-and-Ride locations are clustered near Ashburn in Loudoun County, while the majority of Park-and-Ride facilities in Prince William County are located near Manassas and Woodbridge in Segment G1. The Park-and-Ride locations in Prince William County and Loudoun County are heavily used, with utilization rates of 80 percent and 77 percent, respectively. Both counties have higher than average park-and-ride utilization rates, as the statewide average is 76 percent.



G2 SEGMENT NEEDS

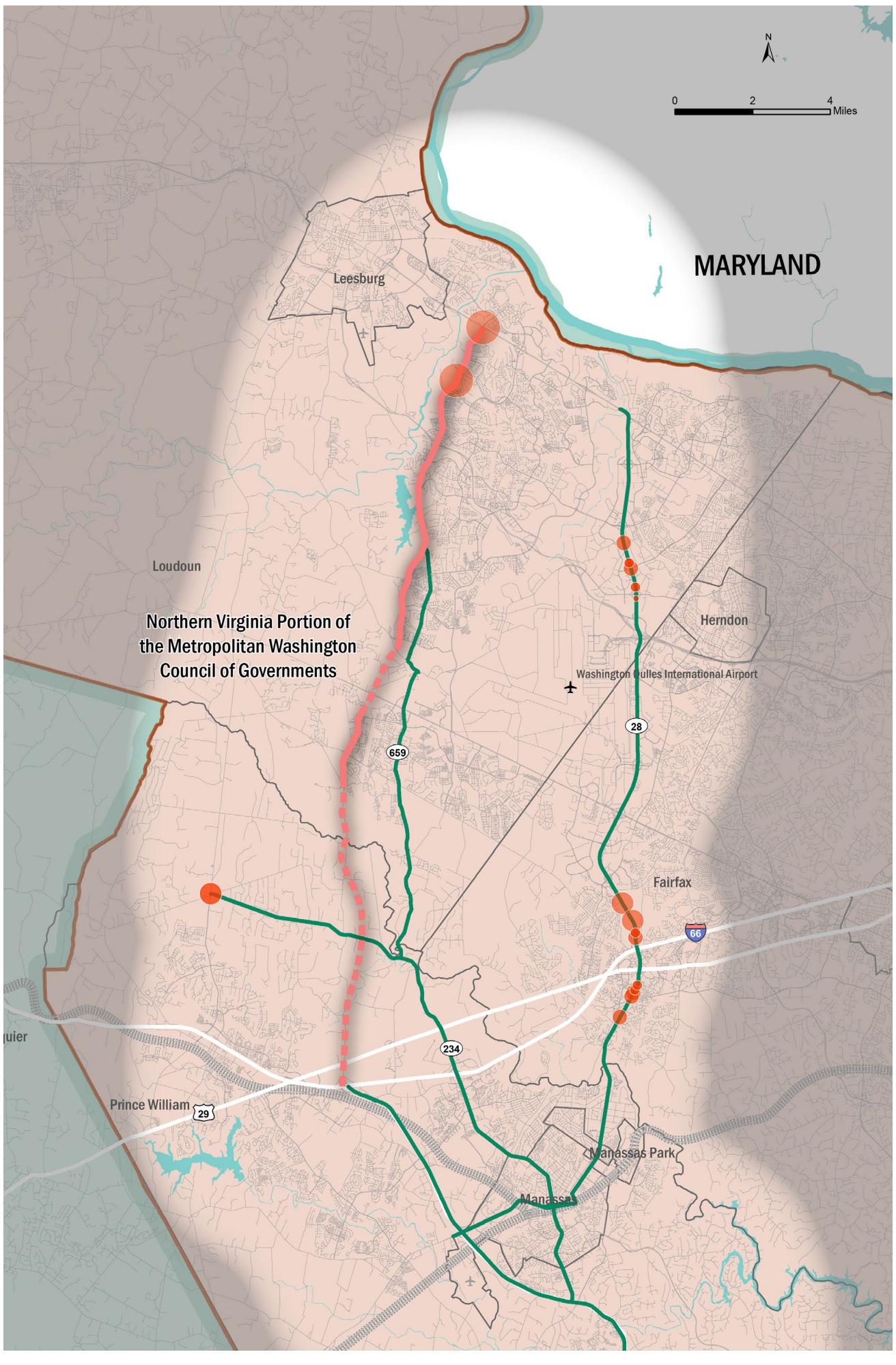
Safety

Performance Metrics

Number of Severe Crashes	20
Severe Crashes/Million VMT	--
Number of Railroad Crashes	0

Currently, the primary facility of Segment G2 is not fully constructed, resulting in a small number of severe crashes in Segment G2 between 2010 and 2012. Only one area experienced severe crashes along Segment G2. There were 20 incidents in Haymarket at the intersection of US 15 (James Madison Highway) and Waterfall Road, just south of the Bull Run Golf Club. Other locations on facilities parallel to Segment G2 which experience large concentrations of severe crashes include:

- US 15 at US 50 in Loudoun County (16 crashes);
- Belmont Ridge Road between Route 267 and Route 7 in Loudoun County (53 crashes);
- Route 28 between Route 267 and Waxpool Road in Sterling (46 crashes); and
- Route 28 between US 29 and Westfield Boulevard in Centreville (98 crashes).

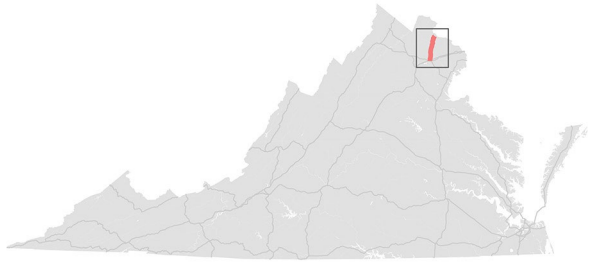


Fatality and Injury Crashes (2010 - 2012)

- < 5
- 5 - 10
- 11 - 15
- 16 - 20
- > 20

Railroad Incidents/Accidents per County (2011-2014)

#



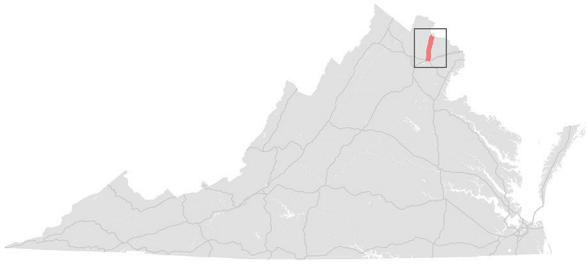
G2 SEGMENT NEEDS

Congestion

Performance Metrics

Person Hours of Delay per Mile 93

Freight Ton Hours of Delay oer Mile 4.9K



Passenger Delays

While the majority of Segment G2 has not yet been constructed, there is already a significant amount of congestion on nearby facilities, with around 8,000 person-hours of delay. This results in 93 person-hours of delay per mile across the entire corridor segment, one of the highest values in the Commonwealth. Locations with significant levels of passenger delay include:

- Route 28 between the City of Manassas Park and US 50 in Fairfax County;
- Route 28 south of Route 625 in Loudoun County;
- Route 659 (Belmont Ridge Road) between the Dulles Greenway and Route 7 in Loudoun County; and
- Route 659 between US 50 and Shreveport Drive in Loudoun County.

Freight Delays

Compared with other CoSS segments, G2 has minimal freight delays, since this segment is not currently a major freight corridor. As such, there are no locations of significant freight delay along Segment G2. Peak-period freight delays account for 42 percent of daily congestion, which is considerably above the average peak period congestion share for freight among CoSS segments.

Daily Person Hours of Delay Per Mile

< 50
51 - 100
101 - 250
251 - 500
> 500

Daily Freight Ton Hours of Delay Per Mile

< 100,000
100,001 - 250,000
250,001 - 500,000
500,001 - 1,000,000
> 1,000,000

Reliability

Weekday Peak Reliability

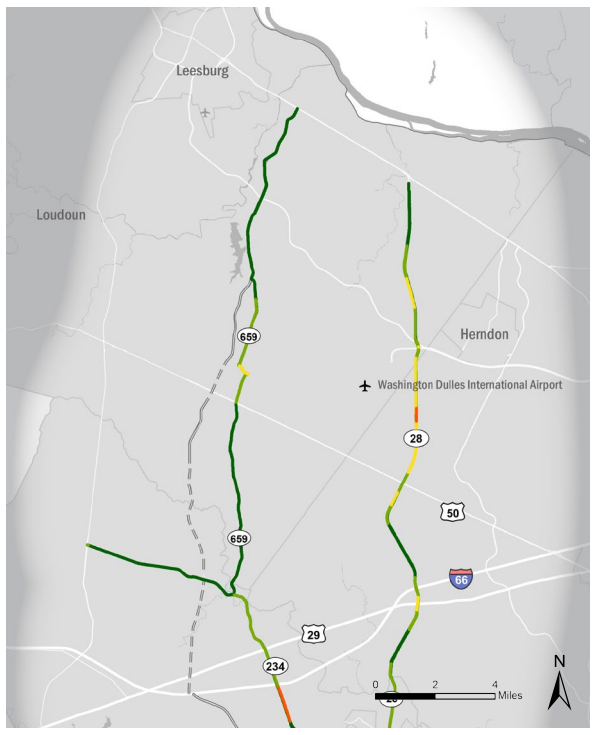
Reliability of travel during the peak period on a typical weekday on Segment G2 ranges from 0.00 to 0.62 in terms of reliability index, with an average value of 0.26. While this segment does have a peak period reliability index much higher than average for the CoSS segments statewide, none of the locations along Segment G2 have reliability index values exceeding the statewide threshold.

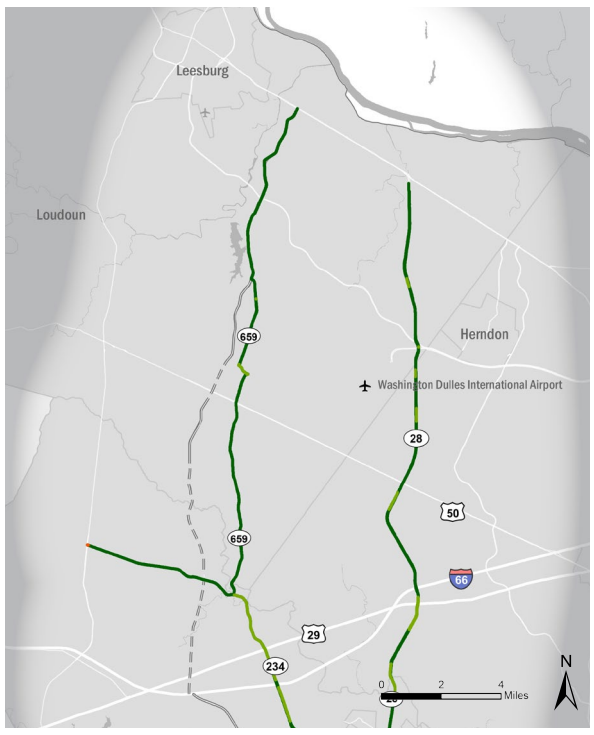
Weekday Reliability

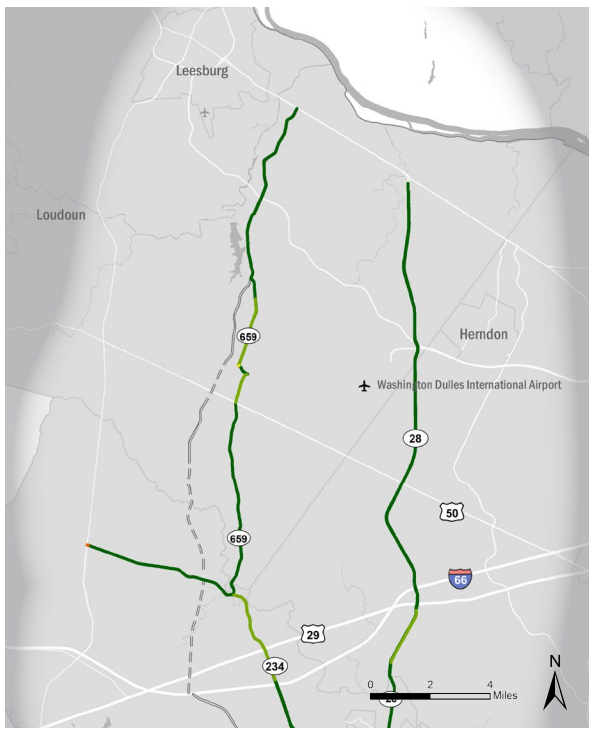
Reliability of travel during on a typical weekday on Segment G2 ranges from 0.05 to 0.69 in terms of reliability index, with an average value of 0.17. While this segment does have a weekday reliability index much higher than average for the CoSS segments statewide, only a short section on Route 234 at US 15 in Prince William County has a reliability index value exceeding the statewide threshold.

Weekend Reliability

Reliability of travel during on a typical weekend on Segment G2 ranges from 0.00 to 0.65 in terms of reliability index, with an average value of 0.11. While this segment does have a weekend reliability index higher than average for the CoSS segments statewide, only a short section on Route 234 at US 15 in Prince William County has a reliability index value exceeding the statewide threshold.





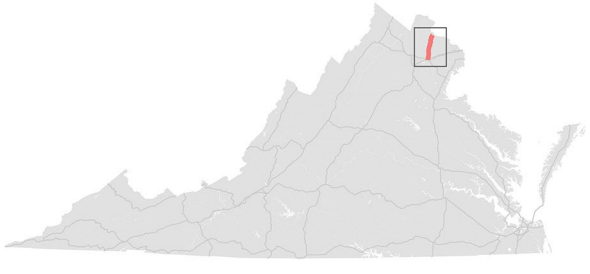


Reliability Index

- < 0.2
- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- > 0.8
- Primary facility (in white)

Statewide reliability index thresholds have been set for weekday peak, weekday and weekend travel to assess the reliability of travel on each segment on all corridors of statewide significance. A higher reliability index indicates that travel times are more unreliable. The following are the reliability index thresholds:

- Weekday Peak - 0.80
- Weekday - 0.40
- Weekend - 0.60



G2 SEGMENT NEEDS

Summary of Needs

Identified locations are approximate. See "Summary of Needs" table on the following page for details.

Mode Choice

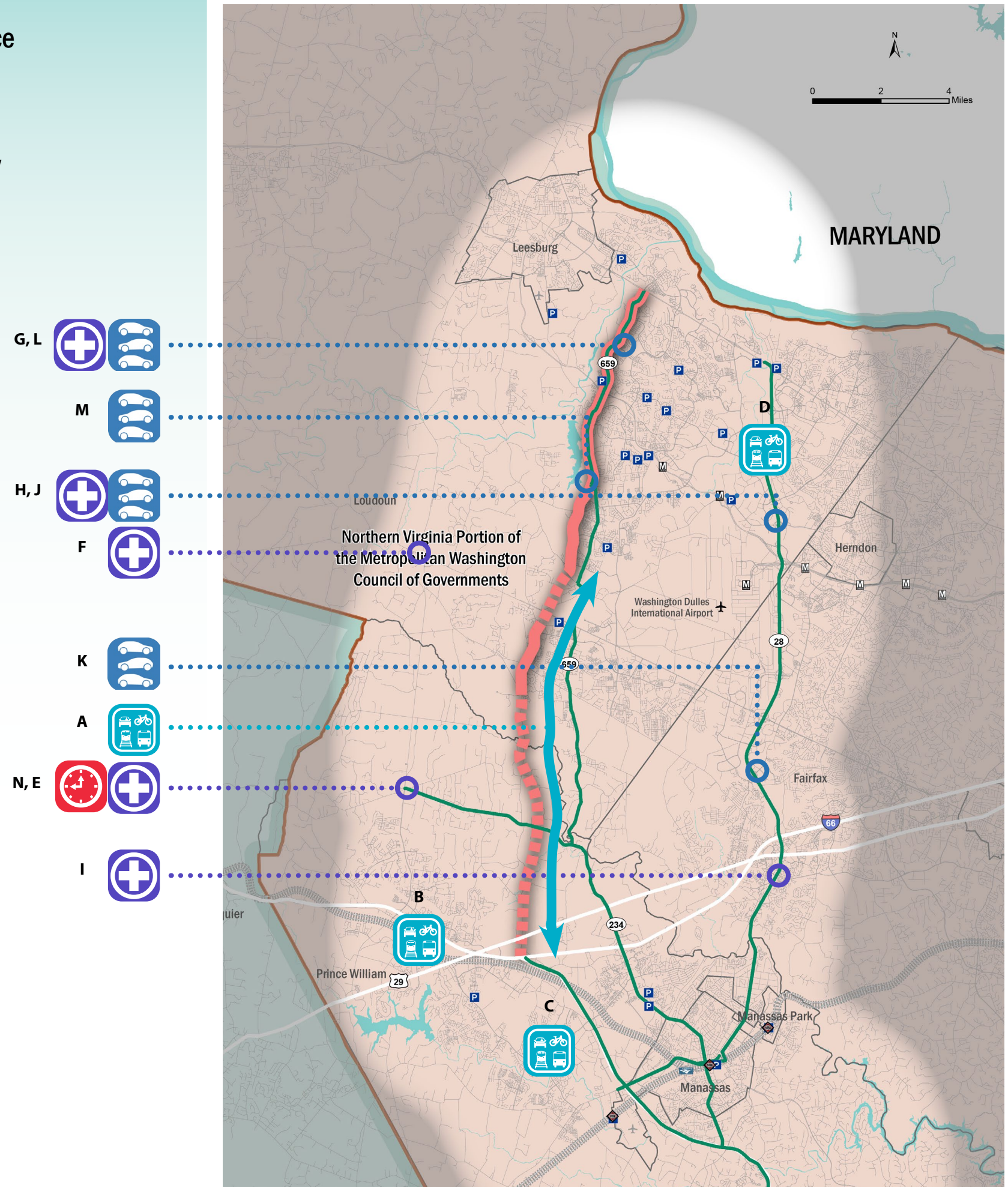
Redundancy

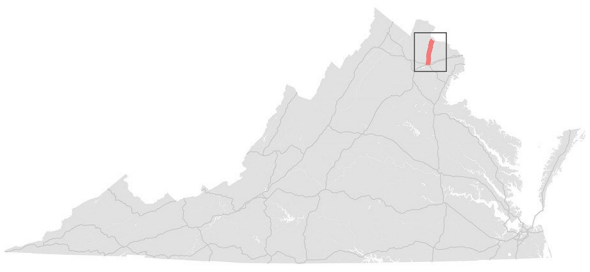
Safety

Congestion

Bottlenecks

Reliability





G2 SEGMENT NEEDS

Summary of Needs - G2 Segment

A.		Continuous, grade-separated facility not present north of I-66
B.		Passenger rail services do not facilitate travel within the corridor
C.		Park and Ride lots in Prince William County have higher utilization rates than statewide average
D.		Park and Ride lots in Loudoun County have higher utilization rates than statewide average
E.		US 15 at Waterfall Rd in Haymarket: 20 severe crashes
F.		US 15 at US 50 in Loudoun County: 16 severe crashes
G.		Belmont Ridge Rd between VA 267 and VA 7: 53 severe crashes
H.		Route 28 between VA 267 and Waxpool Rd in Sterling: 46 severe crashes
I.		Route 28 between US 29 and Westfield Blvds in Centreville: 98 severe crashes
J.		Congestion issue on VA Route 28 between VA Route 267 (Dulles Greenway) and VA Route 625 (Waxpool Road)
K.		Congestion issue on VA Route 28 between I-66 and US 50
L.		Congestion issue on VA Route 659 (Belmont Ridge Road) between VA Route 267 (Dulles Greenway) and VA Route 7 in Loudoun County
M.		Congestion issue at VA Route 659 (Belmont Ridge Road) and VA Route 772 (Ryan Rd) in Brambleton
N.		Reliability issue at VA Route 234 (Sudley Road) and US 15 in Loudoun County