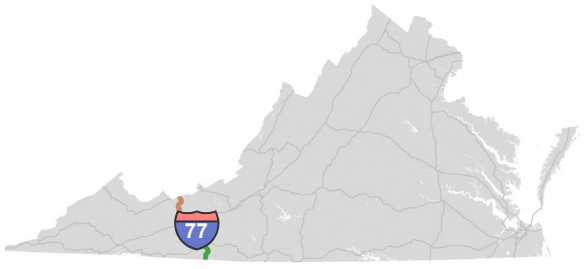
VTrans2040 Multimodal Transportation Plan

Corridors of Statewide Significance Needs Assessment

Western Mountain Corridor (L)



Office of INTERMODAL Planning and Investment

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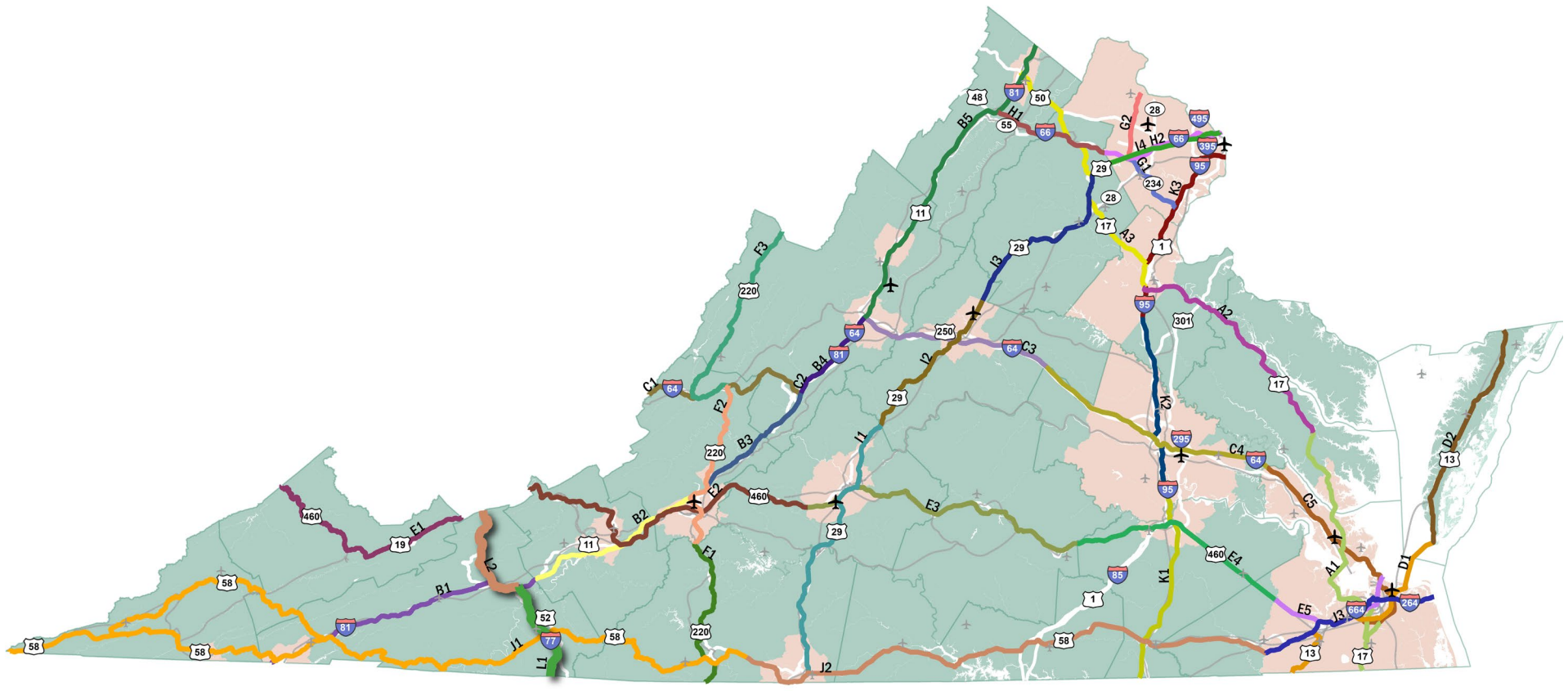
See *Corridors of Statewide Significance, Needs Assessment: Executive Summary and Methodology Report* for details on the overall assessment approach, data sources, and performance measures used throughout this report.

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

The Western Mountain Corridor (Corridor L) is defined primarily by I-77, a multi-lane interstate highway that runs from Ohio to South Carolina, with its northern terminus in Cleveland, Ohio, and its southern terminus in Columbia, South Carolina. In southwestern Virginia, I-77 serves as an important corridor, traversing approximately 67 miles between the West Virginia state line to the north and the North Carolina state line to the south.

I-77 runs concurrently with I-81/US 11 for approximately 13 miles and provides access to US 58 (Corridor J) in southern Virginia and US 460 (Corridor E) just north of the border in West Virginia. US 52 runs parallel or concurrently with I-77 in the corridor throughout its length in Virginia.

Because the Western Mountain Corridor is mostly rural outside of Wytheville, passenger travel is accomplished primarily via the highway facilities. Only a few other travel options are available, including:

- A Greyhound bus station in Wytheville, providing bus connections to North Carolina, West Virginia, and Roanoke;
- Multiple Park-and-Ride lots near Wytheville; and
- A single airport facility, the Twin County Airport, located south of I-81, which serves as a community general-aviation facility. No airport facilities with commercial service are located along the Western Mountain Corridor. The two closest facilities with commercial connections are the Roanoke-Blacksburg Regional Airport and the Tri-Cities Airport in Tennessee.

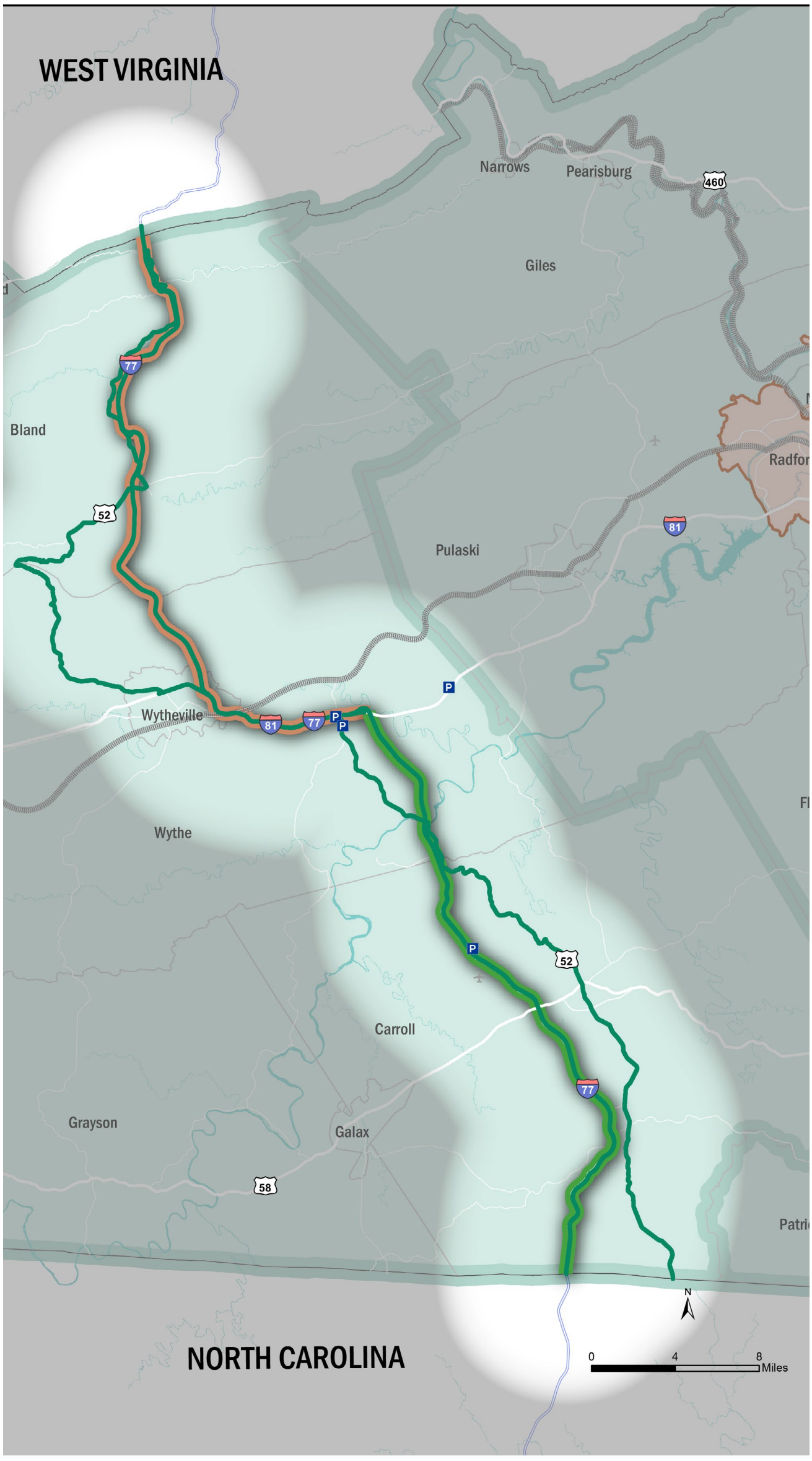
There are no direct connections to any port facilities, although the Western Mountain Corridor is a heavy-freight corridor, acting as an alternative to I-81 and connecting it to the US 58 corridor. There are no direct rail lines along most of the Western Mountain Corridor. However, the western half of Norfolk Southern's Crescent Line runs along the part of the corridor where I-77 runs concurrently with I-81.

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)

Corridor Components

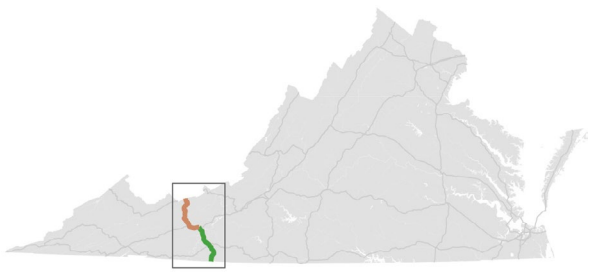
Highway Facilities	
Primary Facility	• I-77
Other Highway Facilities	• US 52
Transit Services	
	• Intercity bus service
Rail Facilities	
	• Norfolk Southern Crescent Corridor



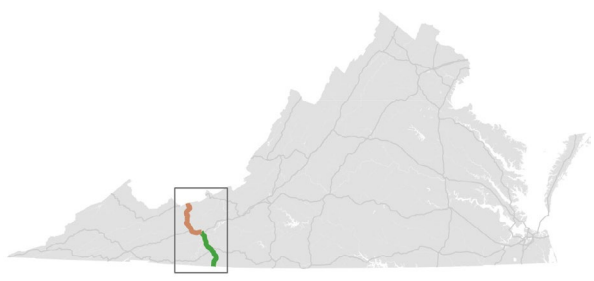
Corridor Segments:
- L1
- L2

- 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

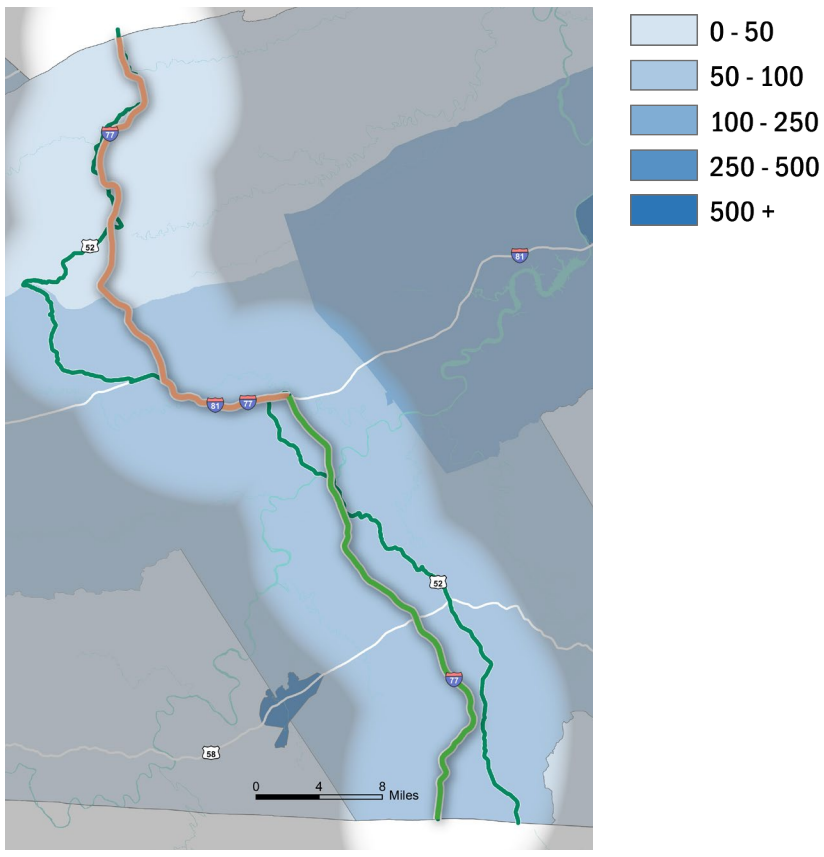


Generally, the population density along Corridor L is less than 100 persons per square mile. Bland County has the lowest density along the corridor with less than 50 persons per square mile. Of the segments in Corridor L, Segment L1 is more densely populated.

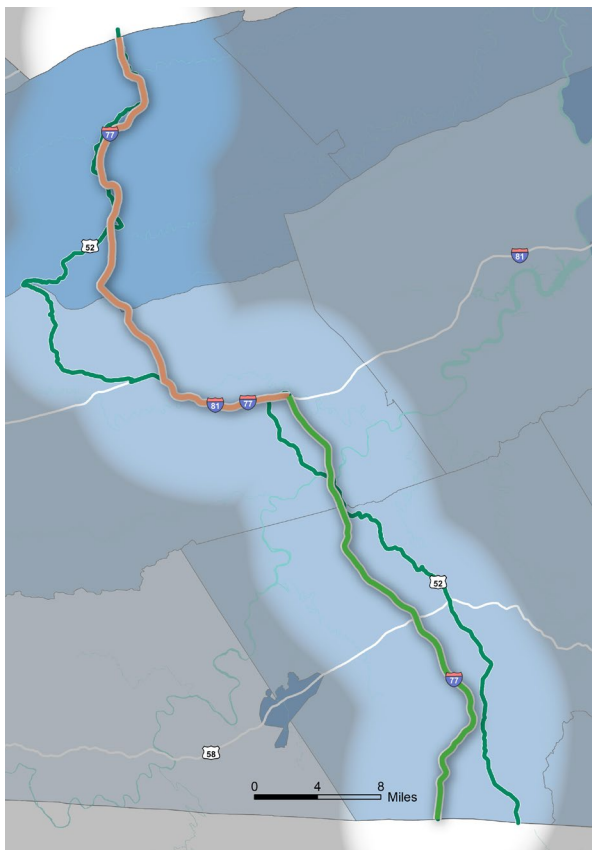
Between 2012 and 2025, Bland County is projected to experience the largest population growth (six to ten percent) among the jurisdictions along the corridor. Carroll and Wythe Counties are anticipated to have population growth between one and five percent. Overall, population along the corridor is expected to grow.

Current employment centers follow a pattern similar to the population centers, with the highest concentration of employment in Wythe County. Employment growth between 2012 and 2025 is forecast to be highest in Bland and Carroll Counties, with an increase in jobs between six and ten percent.

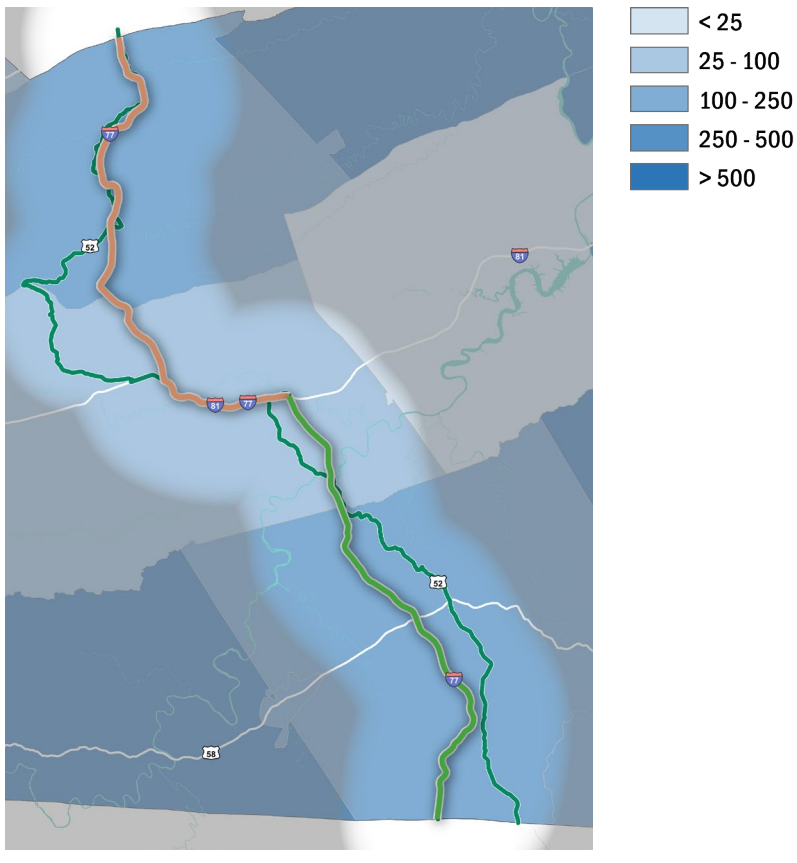
2012 Population Density (Persons / Square Mile)



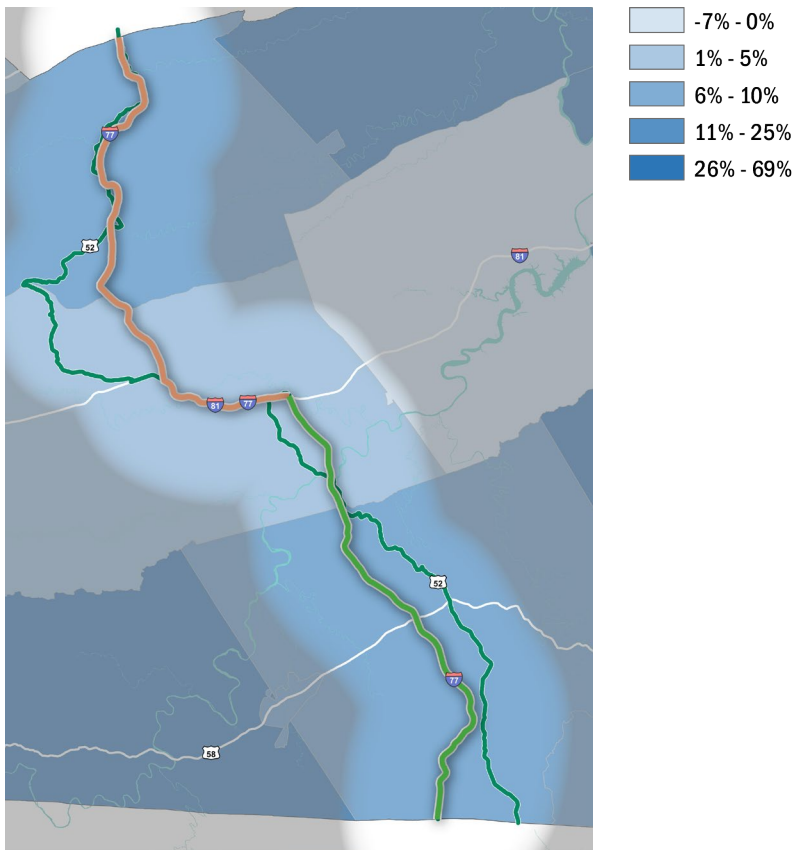
Population Growth (2012 - 2025 Percent Change)



2012 Employment Density (Jobs / Square Mile)



Employment Growth (2012-2025 Percent Change)

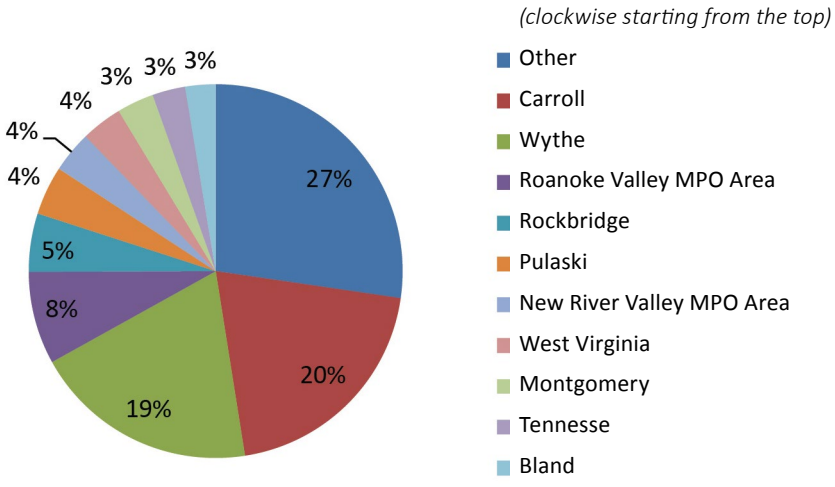


Corridor Travel Patterns

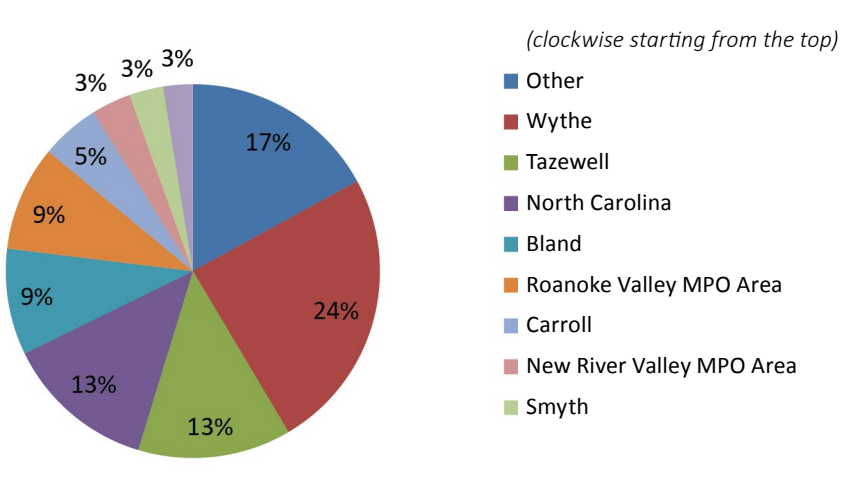
Passenger

Corridor L connects West Virginia and North Carolina, and does not pass through any of the Commonwealth's Metropolitan Planning Organization (MPO) areas. Of the traffic traveling along Corridor L at the West Virginia Border, the highest percentages are destined for locations in Wythe County (24 percent), Tazewell County (13 percent), and North Carolina (13 percent). Of the traffic traveling along Corridor L at the North Carolina border, the highest percentages are destined for locations in Carroll County (20 percent), Wythe County (19 percent), and the Roanoke Valley Area (eight percent).

Corridor L Travel passing North Carolina Border to...



Corridor L Travel passing West Virginia Border to...

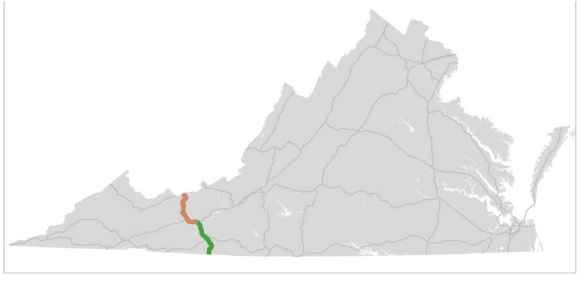


Freight

By truck, Corridor L carried 117 million tons of freight worth $225 billion in 2012, and is estimated to carry 158 million tons of freight worth $334 billion in 2025. Truck freight patterns on this corridor are mostly interstate through-movements, with more than 76 percent of corridor freight tonnage and more than 87 percent of the corridor freight value, passing through Virginia. In terms of both tonnage and value, North Carolina is the largest generator and attractor of truck freight on Corridor L. The largest truck freight movements on Corridor L are between North Carolina and Ohio, accounting for six percent of the total freight tonnage and four percent of the total freight value on the corridor. Several of the largest truck freight flows on Corridor L are movements between the Midwest region and the Southeast region. In terms of value, New York and Pennsylvania are major attractors of truck freight on Corridor L, accounting for 15 percent of the total truck freight value on the corridor.

Truck Freight

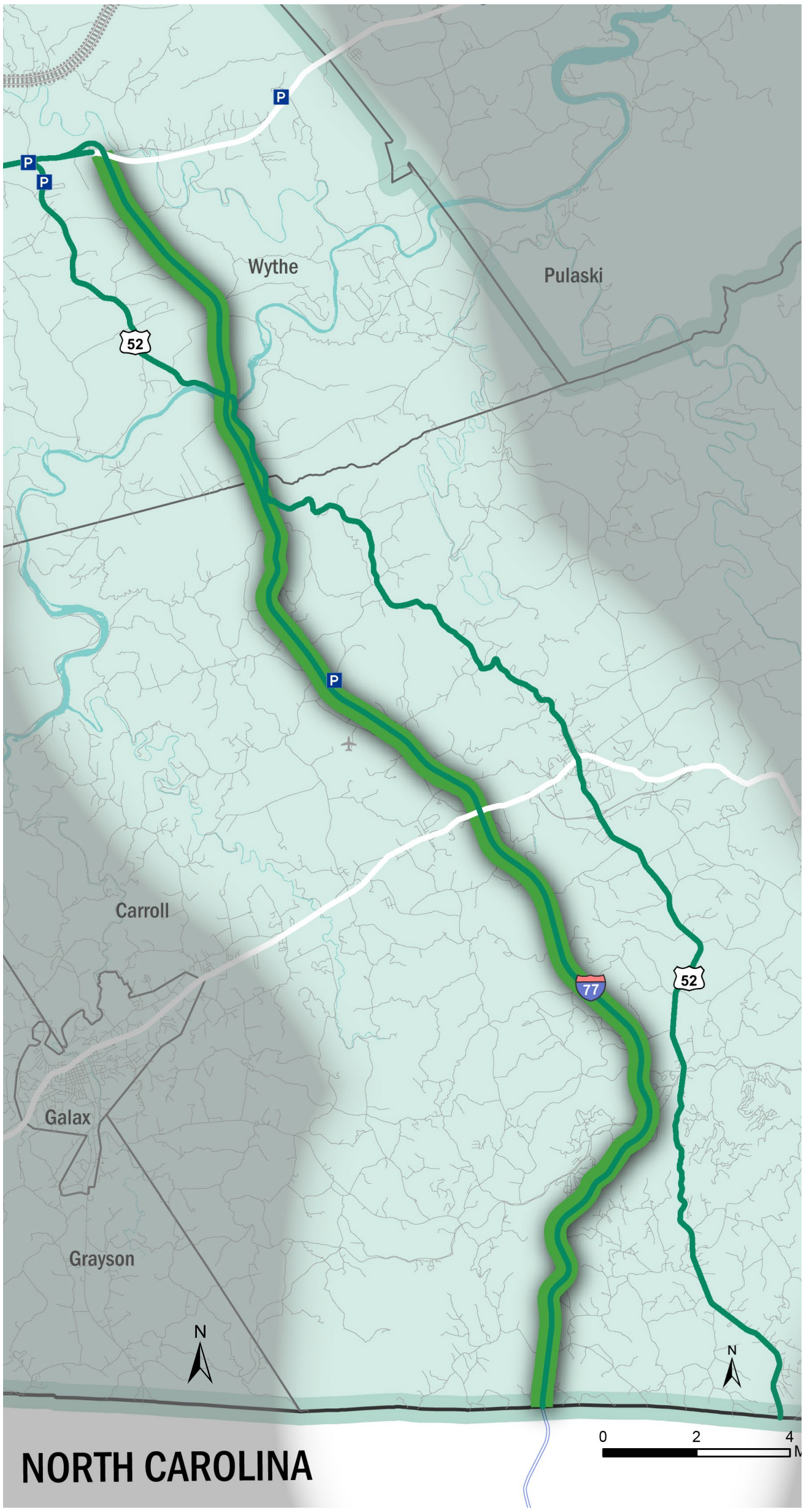
	2012	2025
Truck Freight Value	$225 Billion	$334 Billion
Truck Freight Tonnage	117 Million Tons	158 Million Tons
Freight Value per Ton	$1919	$2111
Corridor Tonnage Passing Through	76%	77%



II. Segment L1

Corridor Segment L1 Components

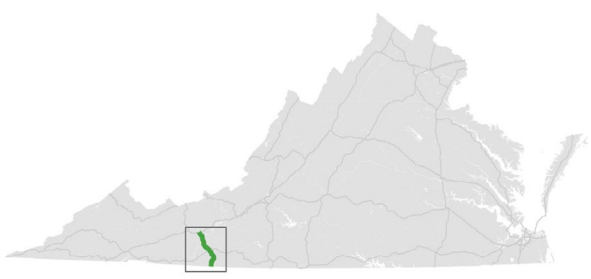
- I-77
- US 52



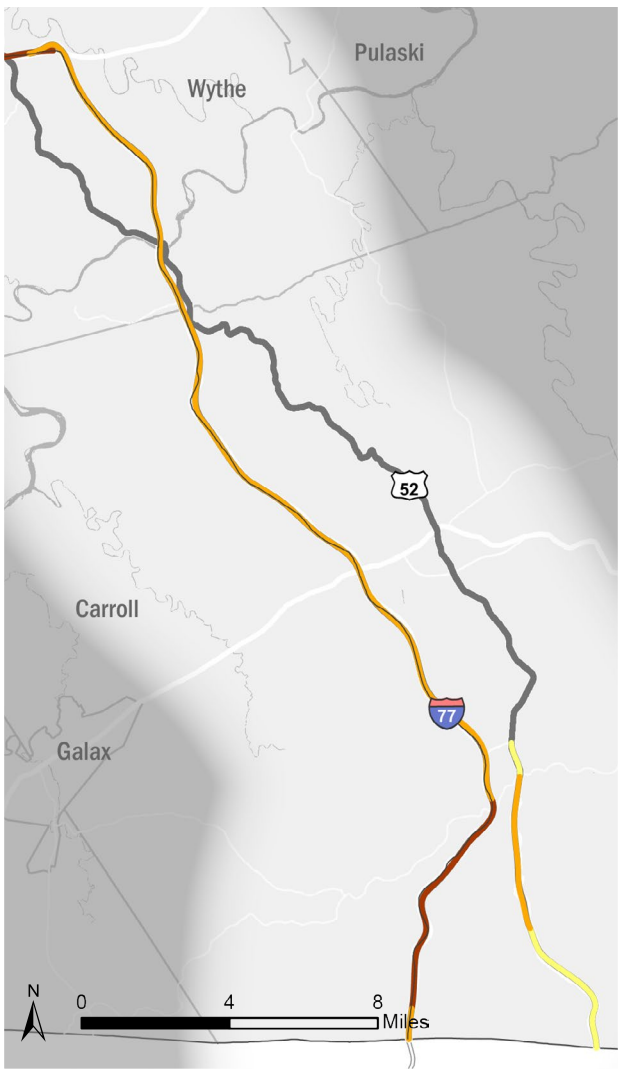
Segment L1

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

MPO Area
Planning District Area

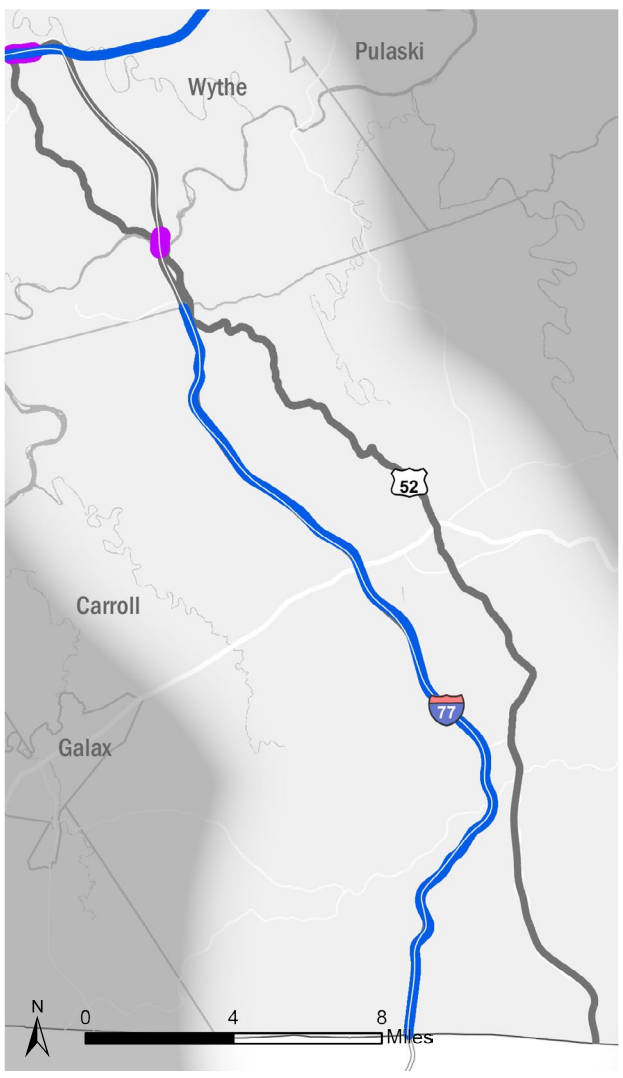


L1 SEGMENT PROFILE



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 L1 begins at the North Carolina border and progresses north to the eastern junction of Interstates I-77 and I-81, serving Carroll and Wythe Counties. The segment does not travel through any area covered by an MPO. Segment L1 serves as an inter-state freight connection, linking North Carolina and South Carolina to West Virginia and the Midwest. The segment also provides a connection between the southeast and freight facilities located within the I-81 corridor, including the Virginia Inland Port.

Highway Facilities: I-77 is primarily a rural highway with four lanes through most of Segment L1. US 52 serves as a parallel highway facility to I-77 throughout this segment.

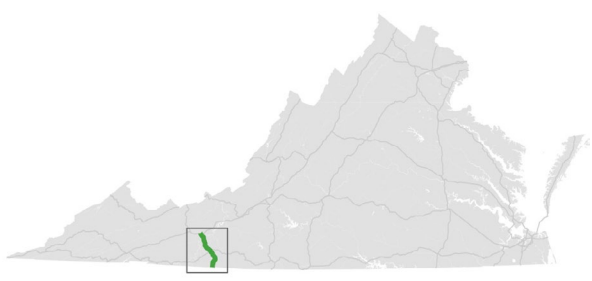
Transit Services: There is one Park-and-Ride location within Segment L1, located north of Woodlawn in Carroll County.

Rail Facilities: There are no freight rail facilities in Segment L1.

Port Facilities: Segment L1 does not provide direct connections to any port facilities, although it does connect to US 58 and I-81, which connect to the Port of Virginia facilities in the Hampton Roads Area and the Virginia Inland Port, respectively.

Airport Facilities: There are no commercial airports in this segment.

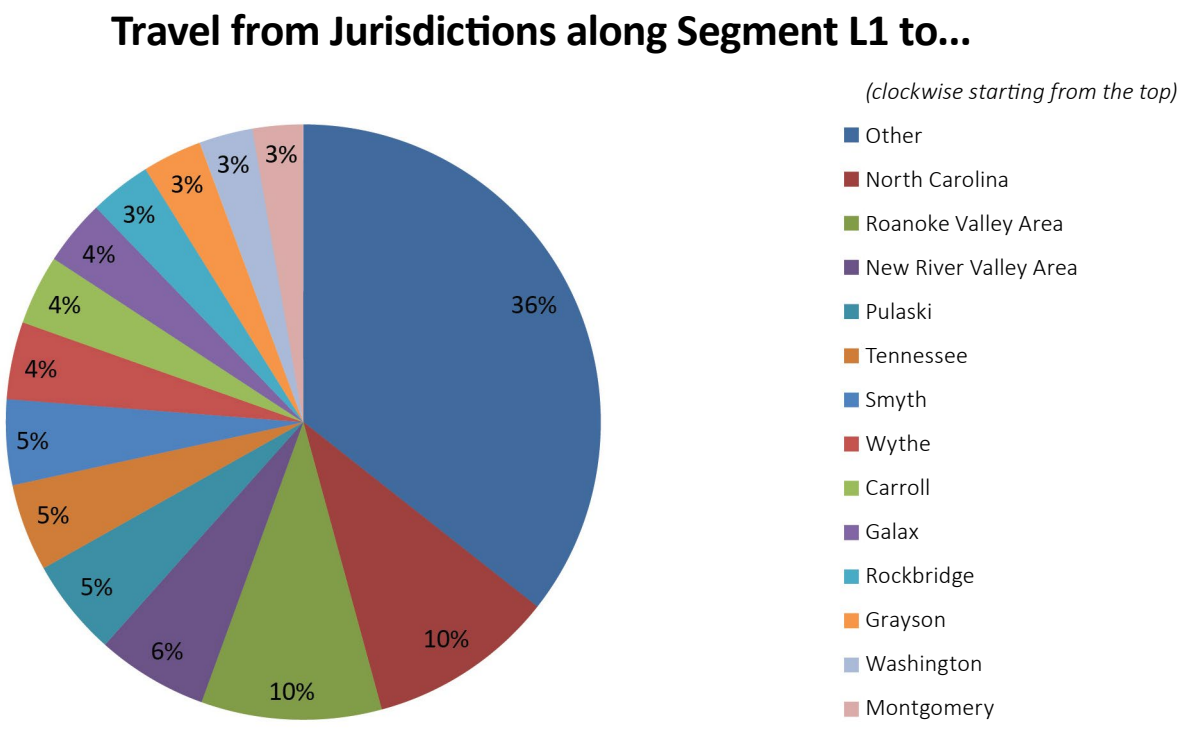
Major planned and future projects include: There are no major planned projects to improve safety or increase capacity at this time.



Travel Demand

Passenger Demand

Segment L1, the southern segment on Corridor L, connects North Carolina to Corridor B via Carroll and Wythe Counties, although it does not provide direct access to any of the Commonwealth's MPO Areas. Intercity passenger travel from these counties accounts for a small percentage of intercity travel in the Commonwealth (just over one percent), but major markets for this travel include North Carolina (ten percent), the Roanoke Valley Area (ten percent), and travel between the two counties (eight percent total), all of which may use portions of Segment L1.



L1 SEGMENT PROFILE

Freight Demand

By truck, Segment L1 carried 80 million tons of freight worth $142 billion in 2012, and is estimated to carry 109 million tons of freight worth $204 billion in 2025. Truck freight patterns on this corridor are mostly interstate through-movements, with more than 76 percent of corridor freight tonnage and more than 87 percent of the corridor freight value, passing through Virginia. In terms of both tonnage and value, North Carolina is the largest generator and attractor of truck freight on Corridor L. The largest truck freight movements on Corridor L are between North Carolina and Ohio, accounting for six percent of the total freight tonnage and four percent of the total freight value on the corridor. Several of the largest truck freight flows on Corridor L are movements between the Midwest and Southeast regions. In terms of value, New York and Pennsylvania are major attractors of truck freight on Corridor L, accounting for 15 percent of the total truck freight value on the corridor. Jurisdictions adjacent to Segment L1 are not major generators or attractors of truck freight on Corridor L, with less than one percent of the freight value originating from or destined for these jurisdictions. Wythe County is the largest generator of truck freight along Segment L1, accounting for two percent of the total truck freight tonnage on Corridor L.

Truck Freight

Major Origins (by Tonnage)
1. North Carolina (16% / 15%)
2. Virginia (14% / 12%)
3. Ohio (8% / 8%)
4. Pennsylvania (7% / 8%)
5. Tennessee (7% / 7%)

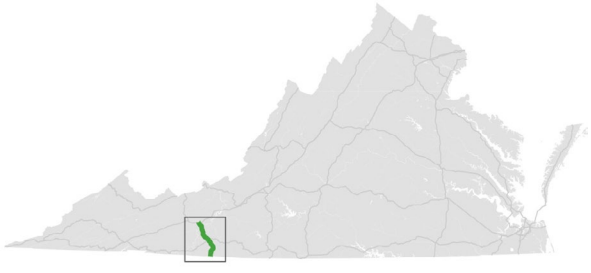
Corridor Tonnage Originating in Segment L1: 3% / 3%

Major Origin-Destination Pairs for Freight
North Carolina and Ohio
North Carolina and Pennsylvania
North Carolina and West Virginia
Ohio and Florida
Ohio and South Carolina

Percentages represent 2012 / 2025 values.

Major Destinations (by Tonnage)
1. North Carolina (17% / 18%)
2. Virginia (13% / 13%)
3. Pennsylvania (7% / 7%)
4. New York (6% / 6%)
5. Ohio (5% / 5%)

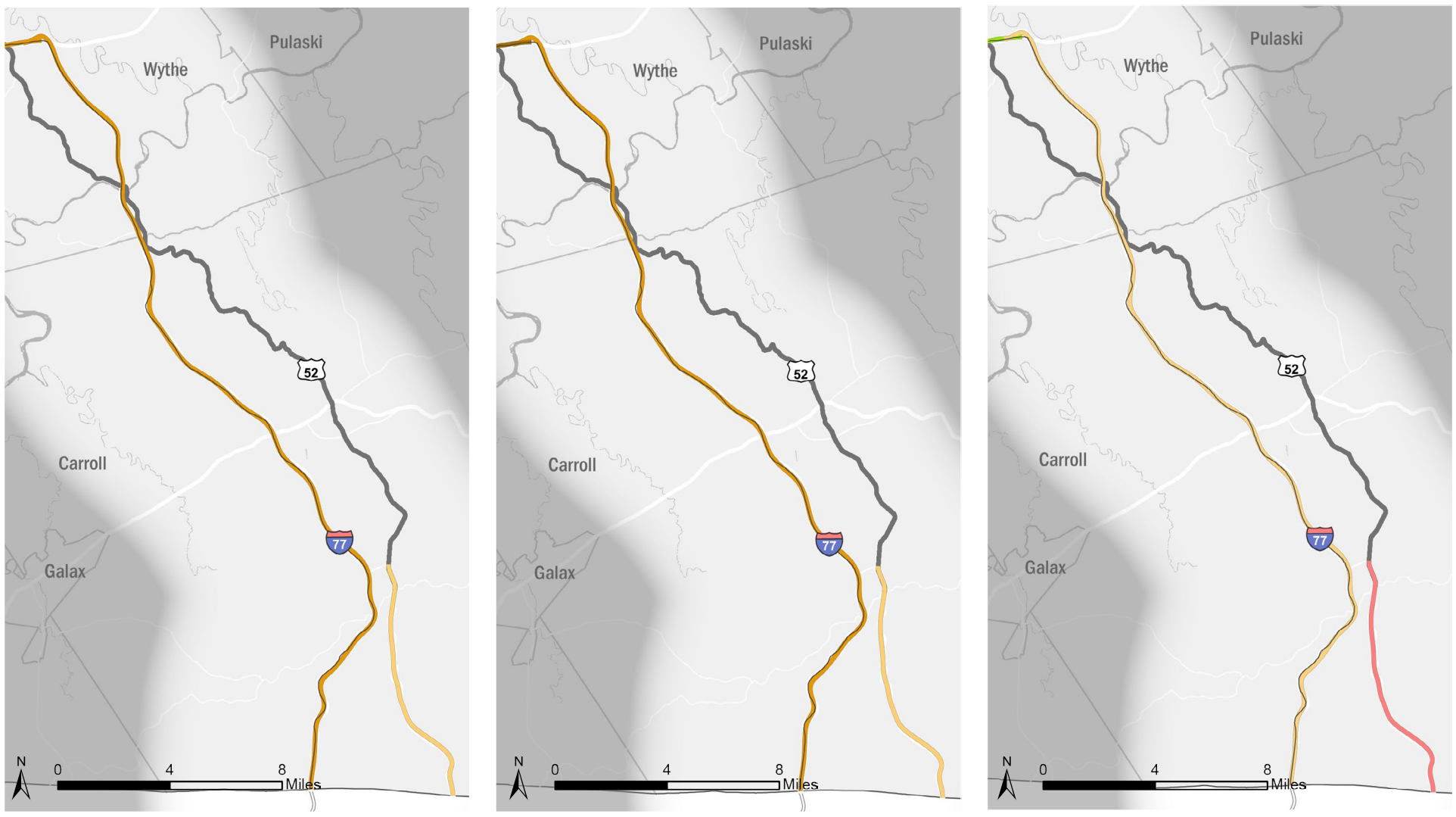
Corridor Tonnage Destined for Segment L1: 1% / 1%

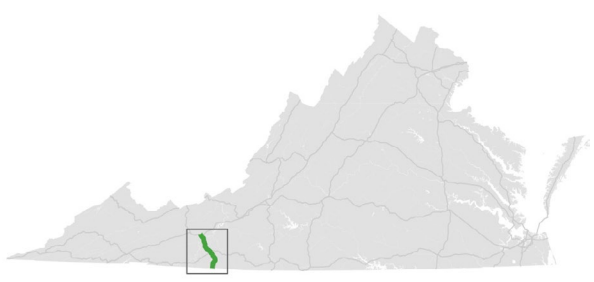


Traffic Conditions

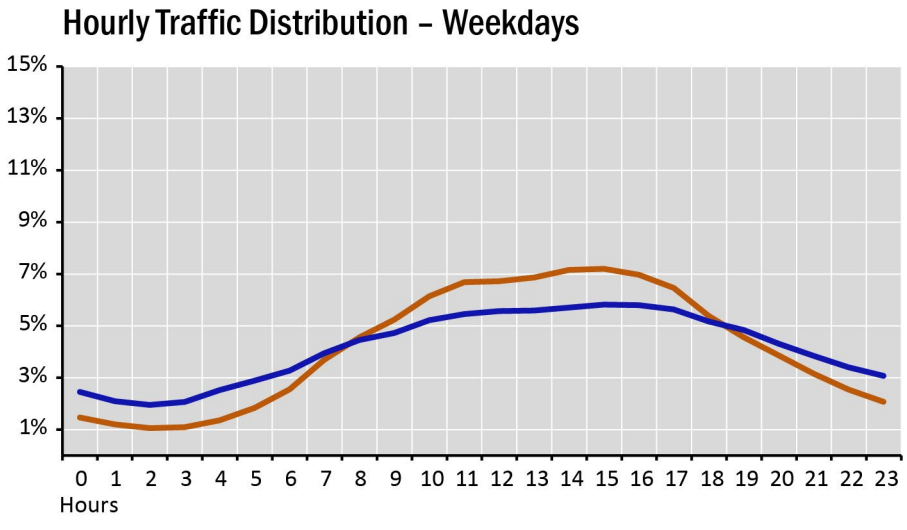
Traffic Volume and AADT

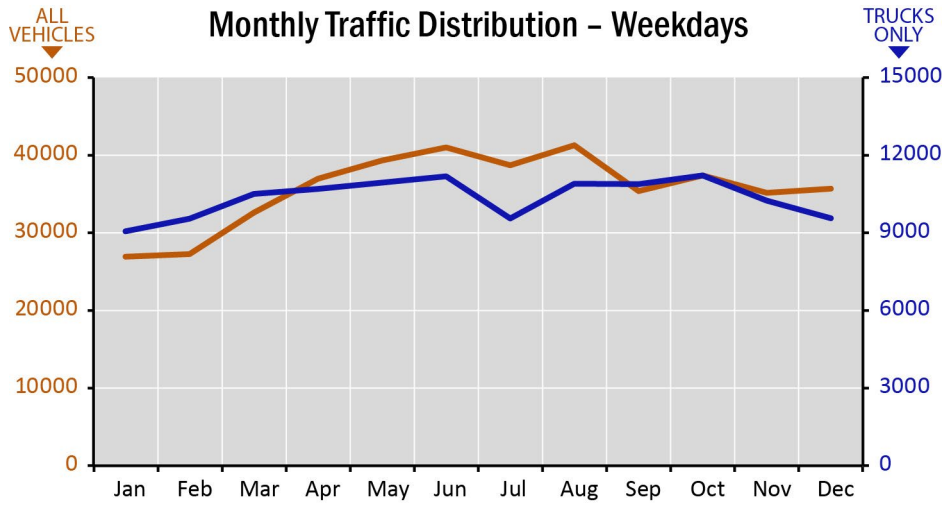
Throughout Segment L1 along I-77, average daily traffic volumes range from 35,000 to 42,000 vehicles. Traffic volumes on US 52 are much lower, with daily volumes less than 8,000 vehicles per day. By 2025, daily traffic volumes along I-77 throughout Segment L1 are projected to increase by approximately 6,000 additional vehicles, with much lower growth projected for US 52.

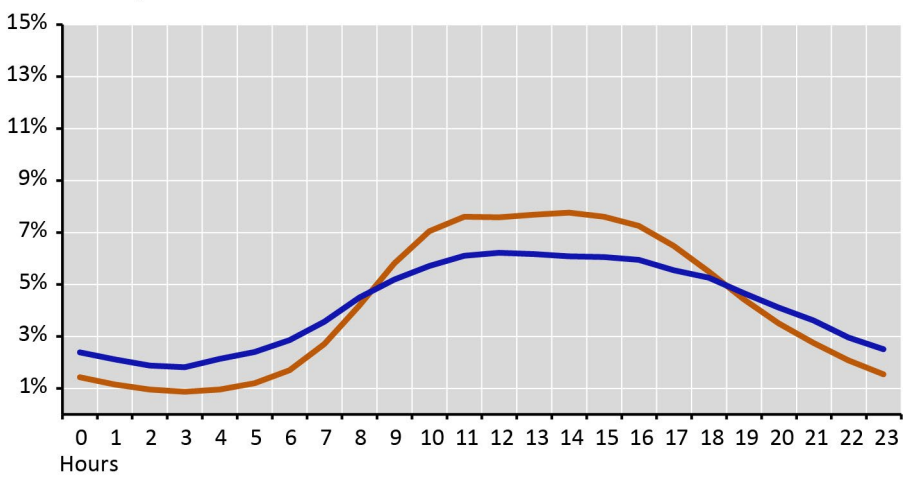


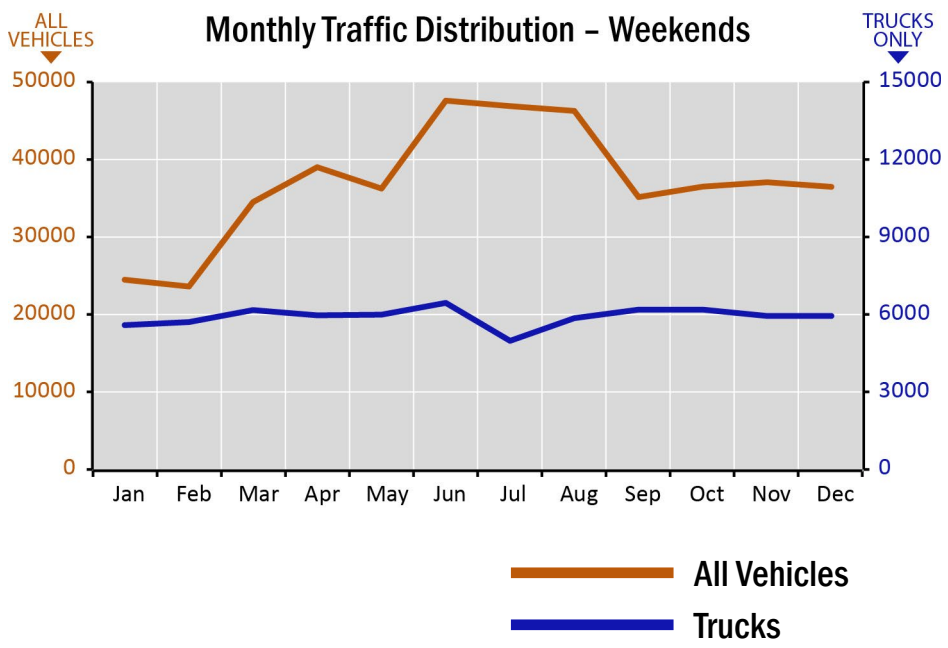


L1 SEGMENT PROFILE





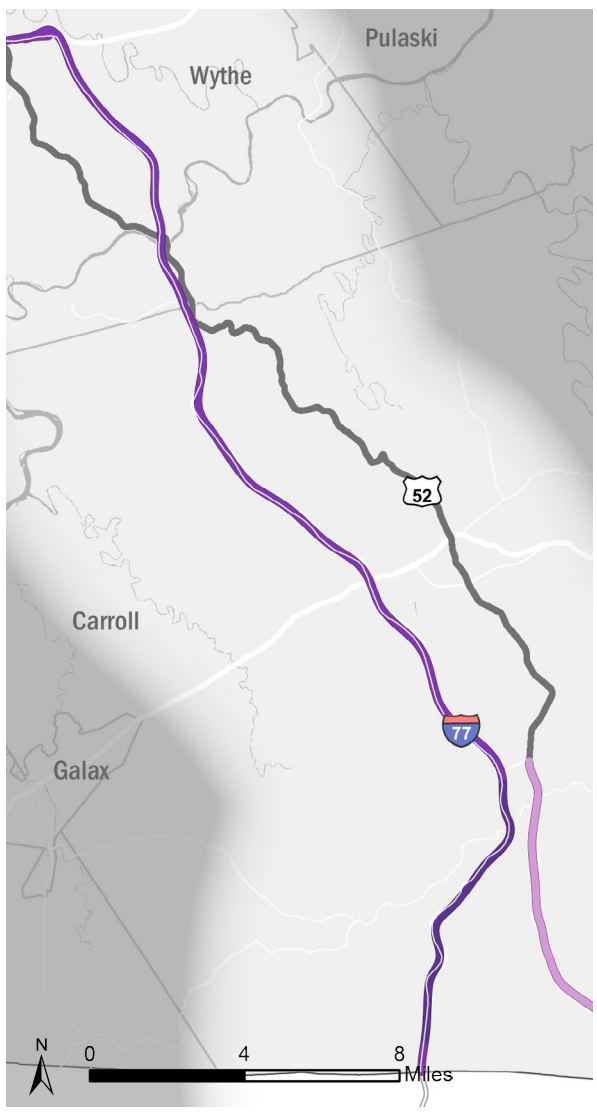




Traffic Distribution

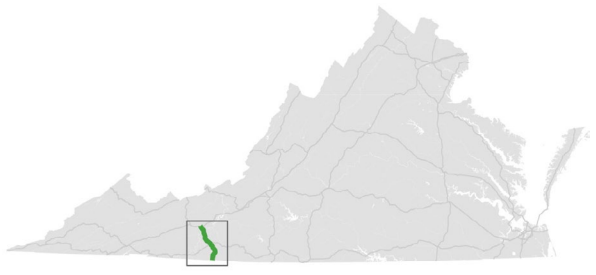
On average, traffic on Segment L1 is distributed throughout the day as shown in the graphs below. Weekday traffic shows a single midday peak period, which is very different from typical commute patterns. The highest hourly traffic occurs between 3 and 4 p.m. which accounts for 7.2 percent of daily traffic. The combined weekday traffic from 7 a.m. to 7 p.m. accounts for 73 percent of total daily traffic. Peaking patterns for truck traffic show a similar profile, with an hourly peak flow of 5.8 percent from 4 to 5 p.m. Weekend traffic patterns also show a single midday peak, with the highest percentage of hourly traffic occurring between 2 and 3 p.m. (7.8 percent of daily traffic) for all traffic, and noon to 1 p.m. (6.2 percent of daily traffic) for truck traffic.

Weekday traffic volumes on Segment L1 vary by as much as 54 percent throughout the year, with the high point in August (around 41,000 vehicles per day) and the low point in January (around 27,000 vehicles per day). Truck volumes vary less than passenger volumes, with the October high (around 11,000 vehicles per day) 24 percent higher than the January low (around 9,000 vehicles per day). Weekend traffic levels also vary over the course of the year, and the highest levels of weekend traffic (June, around 48,000 vehicles per day) are 102 percent higher than February levels (around 24,000 vehicles per day). Weekend truck traffic is significantly steadier than all vehicle traffic, with the June high (around 6,500 vehicles per day) 29 percent higher than the July low (around 5,000 vehicles per day). Truck volumes account for a significant portion of traffic on Segment L1 (29 percent of overall daily traffic for weekdays and 16 percent of overall daily traffic for weekends); as a result truck traffic has an impact on overall traffic conditions.



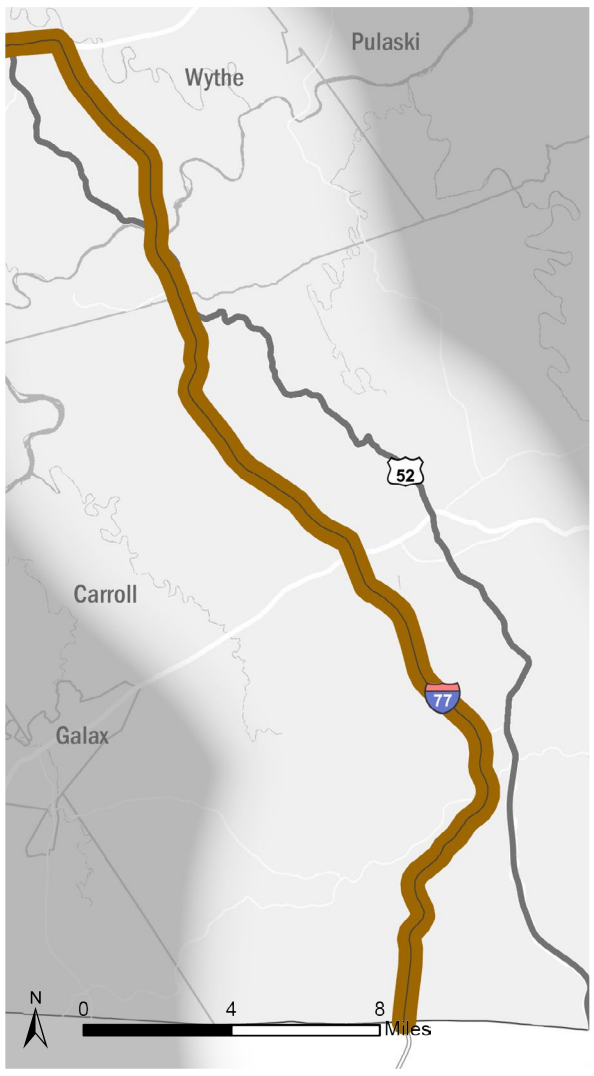
Truck Volumes

The percent of daily traffic comprised of heavy trucks on Segment L1 is relatively high. Along I-77 in southern Carroll County, heavy trucks comprise 20 percent of total traffic. Along I-77 from central Carroll County to I-81 in Wythe County, heavy trucks account for 13 percent of total traffic. Trucks account for only three percent of daily traffic on US 52.



L1 SEGMENT PROFILE

Annual Freight by Tonnage, 2012

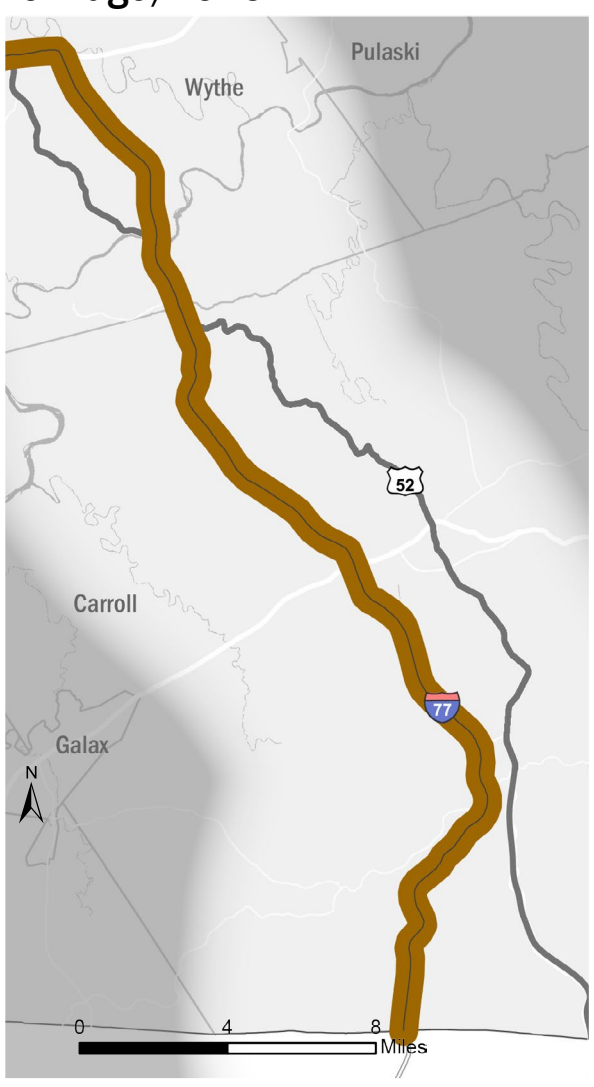


Freight Flows

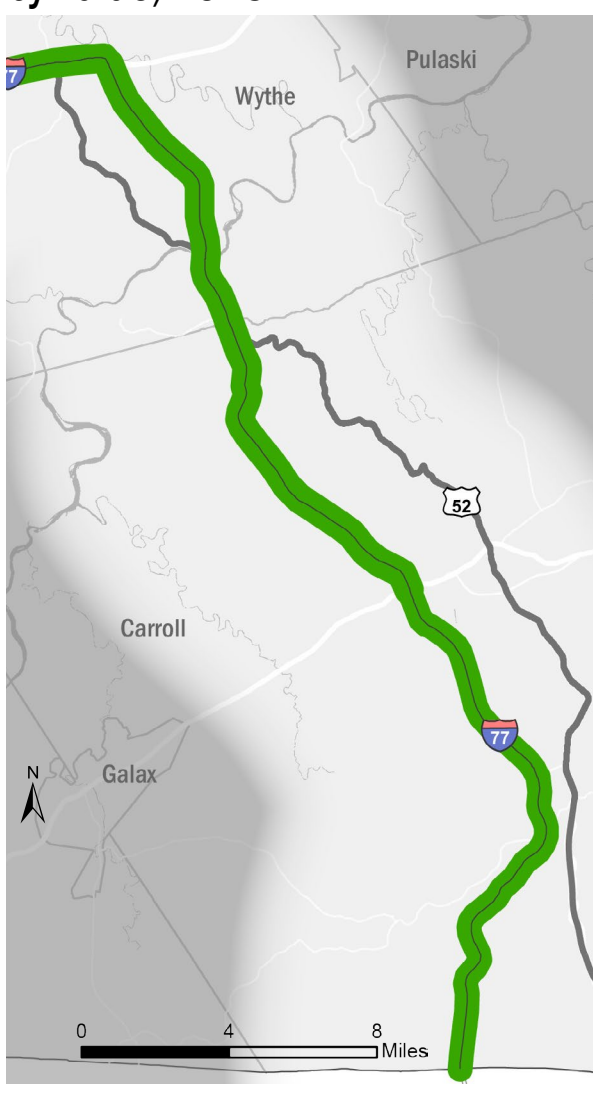
Freight on Segment L1 is moved only by truck as there is no rail link in the Western Mountain Corridor. In Carroll County, 78 million tons of freight worth 138.5 billion is moved through this section of Segment L1 by truck. On average, a ton of freight moving through this section of Segment L1 is worth $1,774. In 2025, truck freight tonnage and value in this area of Segment L1 are expected to increase. It is anticipated that value per ton on trucks will increase to $1,882.

Annual Freight by Value, 2012

Annual Freight by Tonnage, 2025

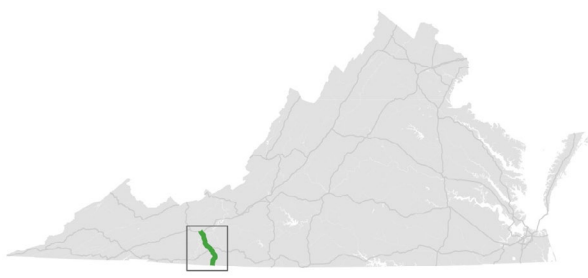


Annual Freight by Value, 2025



Truck Freight (in tons)

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



Truck Freight (Value)

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

Redundancy and Mode Choice

Comparable Travel Options

Wytheville to Charlotte, NC

Inter-City Bus
2 Trips per Day
2:40 Travel Time
$47 Est. Cost

Train
0 Trips per Day
0:00 Travel Time
$0 Est. Cost

Auto
Via I-77: 2:04 Travel Time $77 Est. Cost
Via I-85 / Rt. 52: 3:23 Travel Time $97 Est. Cost

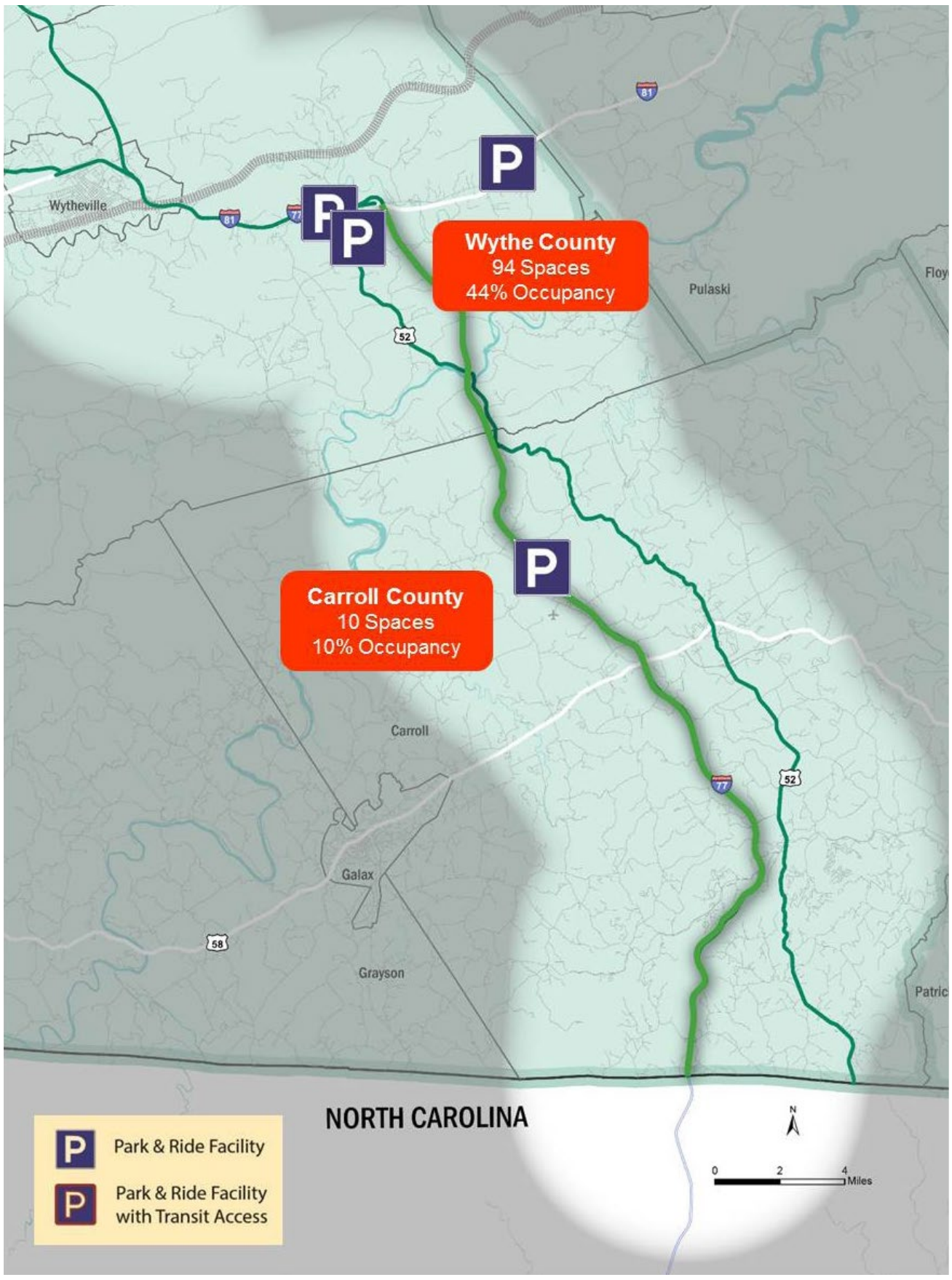
Wytheville to Winston-Salem, NC

Inter-City Bus
1 Trips per Day
1:20 Travel Time
$30 Est. Cost

Train
0 Trips per Day
0:00 Travel Time
$0 Est. Cost

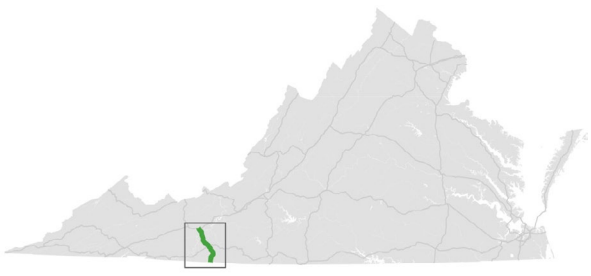
Auto
Via I-77: 1:23 Travel Time $51 Est. Cost
Via Rt. 52: 1:49 Travel Time $50 Est. Cost

Passenger trips on Segment L1 of the Western Mountain Corridor have a limited range of travel options, both in terms of travel path and mode choice. While US 52 serves as a parallel facility, its use for long range travel is limited by speed and capacity; its function as a parallel facility is primarily for local access and bypassing incidents causing congestion on sections of I-77. Applying the 2014 federal standard mileage rates of 56 cents per mile, long-distance trips would be more expensive by automobile than by the available bus service. However, the Greyhound service from Wytheville is limited by the frequency of service.



Park-and-Ride

Within Segment L1, commuters can use one Park-and-Ride location in Carroll County. This Park-and-Ride location, north of Woodland, has a low number of spaces (ten) and a utilization rate of ten percent, which is far below the statewide average of 76 percent for Park-and-Ride utilization.



L1 SEGMENT NEEDS

Safety

Performance Metrics:

Number of Severe Crashes	--
Severe Crashes/Million VMT	--
Number of Railroad Crashes	1

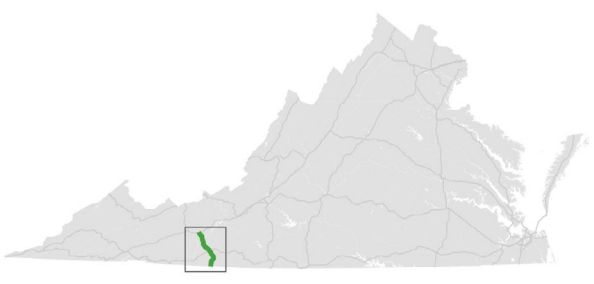
Between 2010 and 2012, no severe crashes occurred along Segment L1.

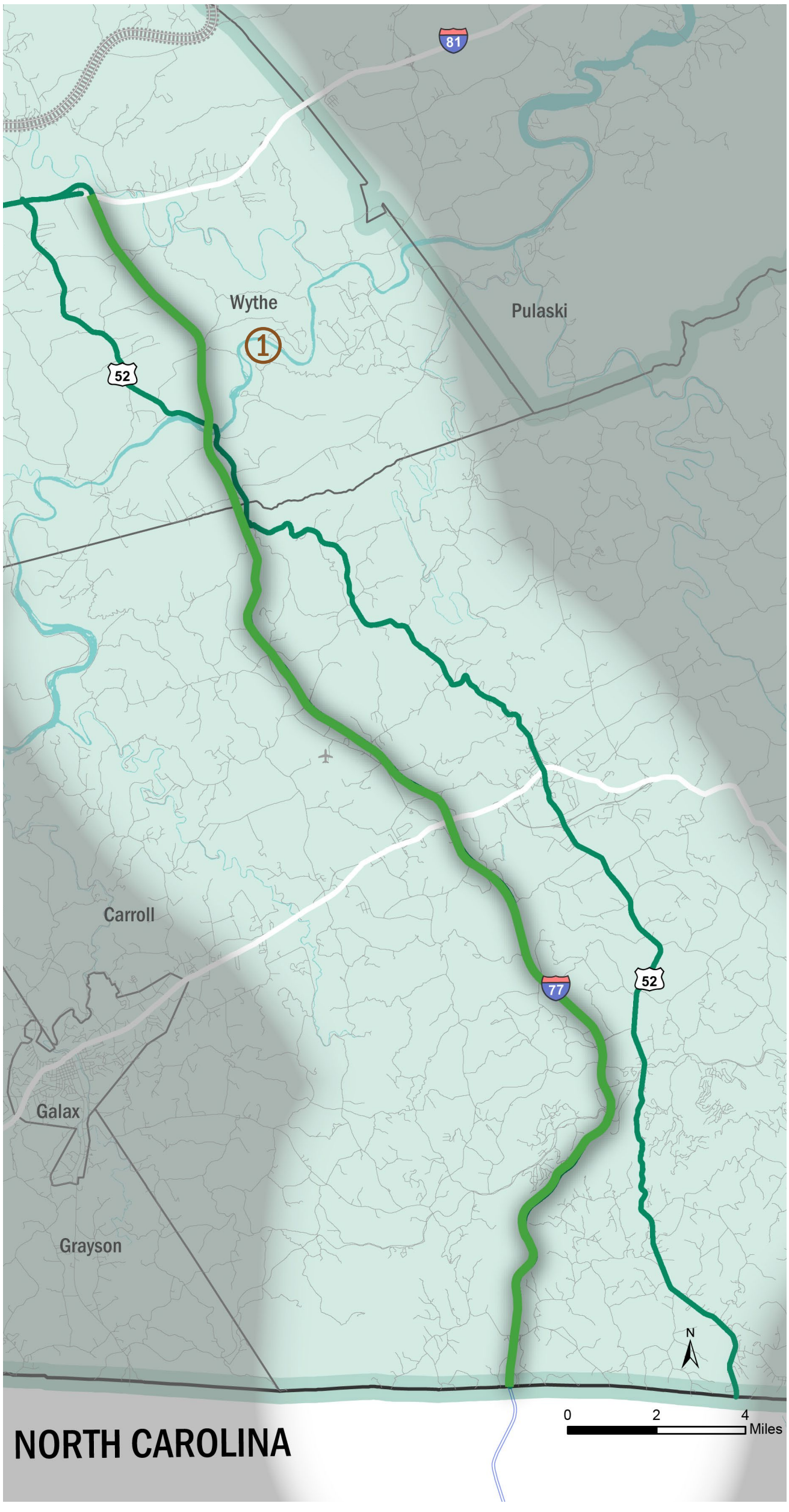
Fatality and Injury Crashes (2010-2012)

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

Railroad Incidents/Accidents per County (2011-2014)

#





Congestion

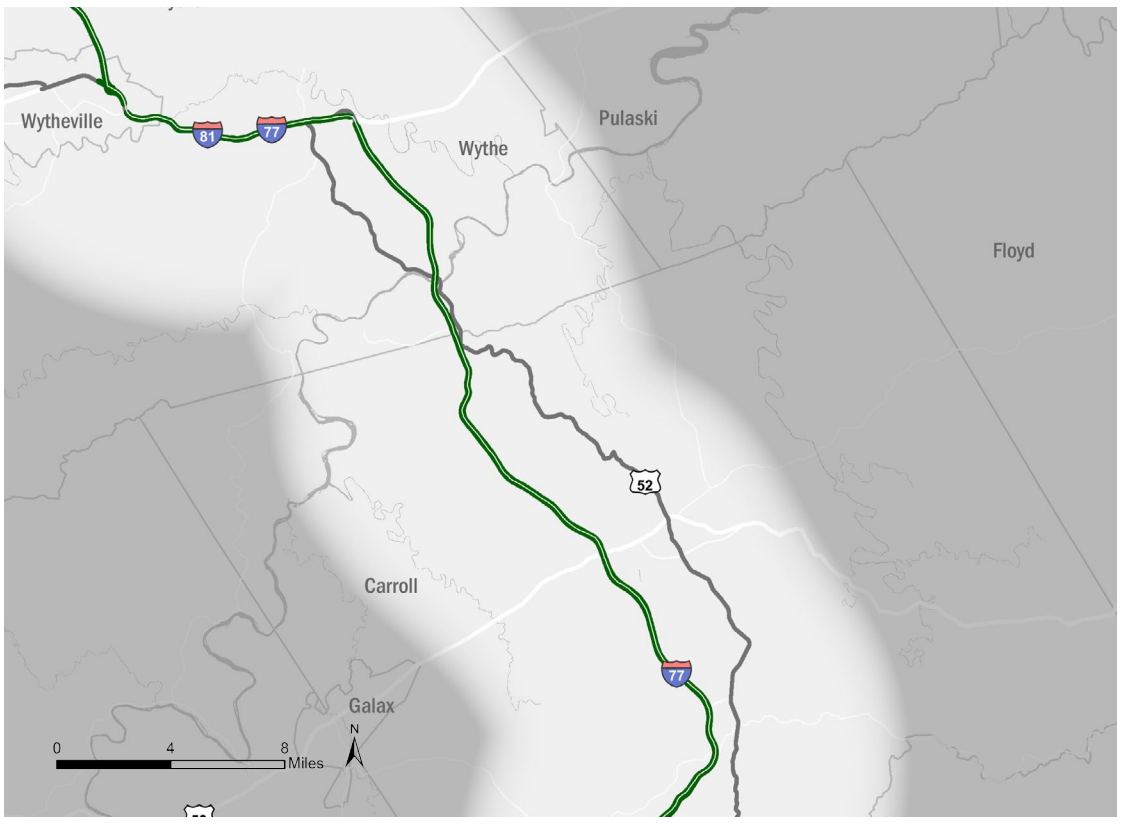
Performance Metrics

Person Hours of Delay per Mile	1
Freight Ton Hours of Delay per Mile	43.4K

Passenger Delays

Passenger delays along Segment L1 are among the lowest in the CoSS segments with daily delays of just 46 person-hours. Passenger congestion is minimal through most of the segment, with no locations experiencing delays of greater than 100 person-hours per mile. Peak-period passenger delays account for 24 percent of daily congestion, which is considerably less than the average for the peak-period share of congestion on CoSS segments.

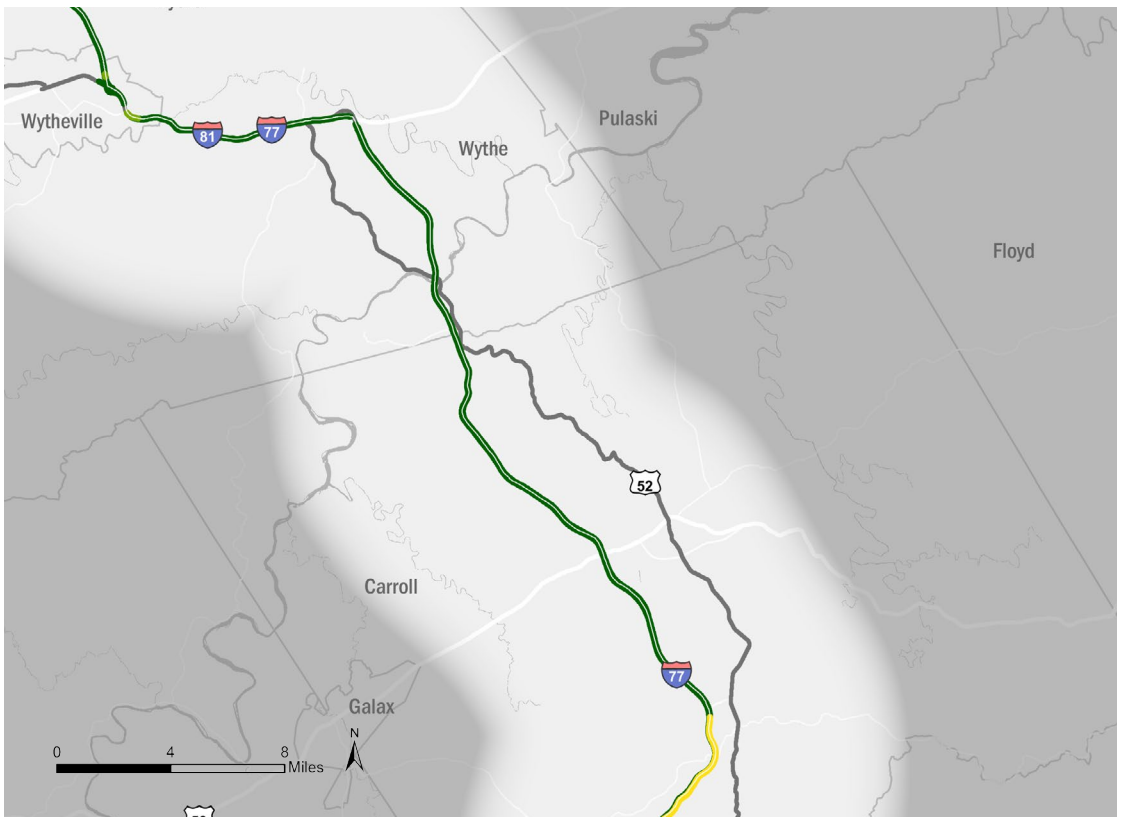
Daily Person Hours of Delay per Mile

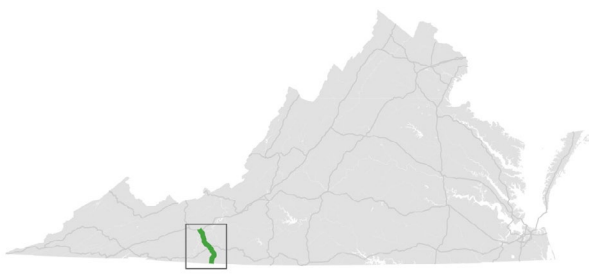


Freight Delays

Unlike passenger delays, there are some significant freight delays on Segment L1. This segment, which is ranked as one of the most congested freight segments, has an average delay of over 43,000 ton-hours per mile. Congestion on most of Segment L1 is minimal, with delays exceeding 250,000 ton-hours per mile on I-77 in Carroll County south of Route 148 near Fancy Gap. This congestion is indicative of heavy freight movement between Virginia and North Carolina. Peak-period freight delays account for 16 percent of daily congestion, which is considerably less than the average for the peak-period share of congestion on CoSS segments.

Daily Freight Ton Hours of Delay per Mile





Reliability

Weekday Peak

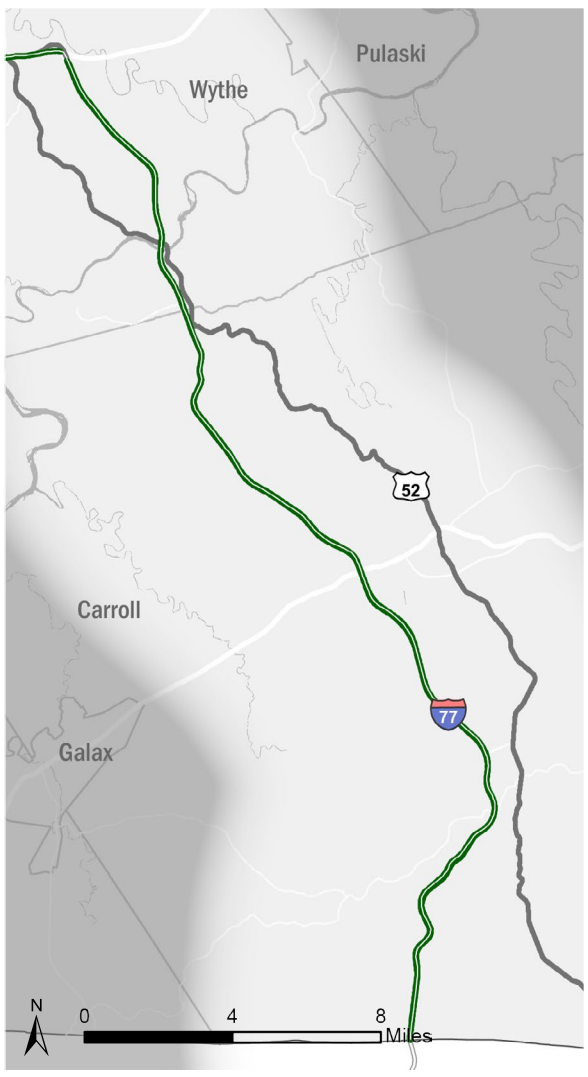
Reliability of travel during the peak period on a typical weekday on Segment L1 ranges from 0.02 to 0.07 in terms of reliability index, with an average value of 0.03. This segment has a peak period reliability index much lower than average for the CoSS segments statewide; therefore, none of the locations along Segment L1 have reliability index values exceeding the statewide threshold.

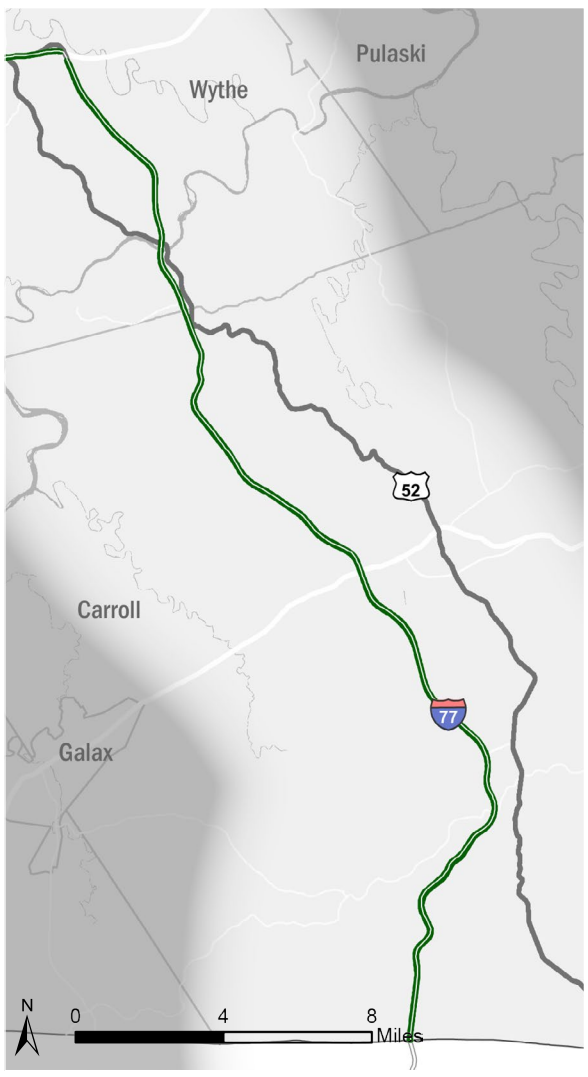
Weekday

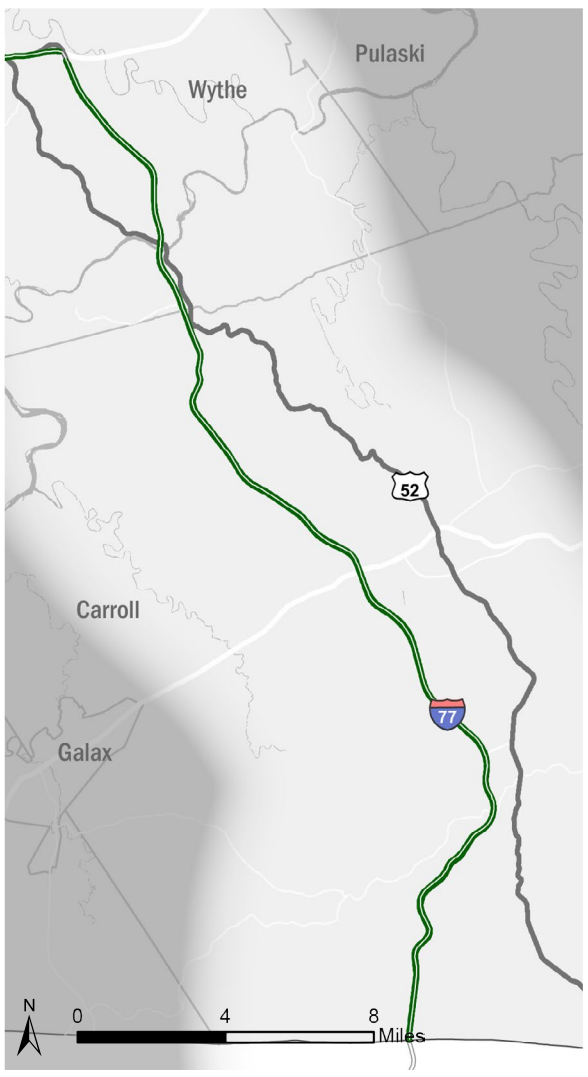
Reliability of travel during a typical weekday ranges from 0.02 to 0.11 in terms of reliability index, with an average value of 0.03. This segment has a weekday reliability index much lower than average for the CoSS segments statewide; therefore, none of the locations along Segment L1 have reliability index values exceeding the statewide threshold.

Weekend

Reliability of travel during a typical weekend ranges from 0.02 to 0.09 in terms of reliability index, with an average value of 0.04. This segment has a weekend reliability index much lower than average for the CoSS segments statewide; therefore, none of the locations along Segment L1 have reliability index values exceeding the statewide threshold.





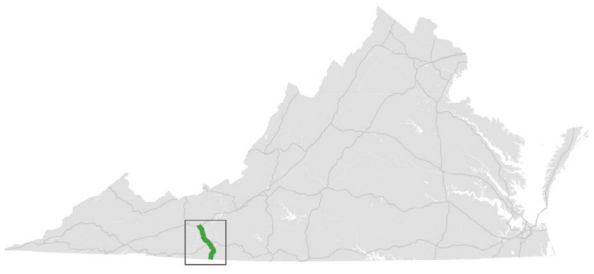


Reliability Index

- < 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.

Redundancy

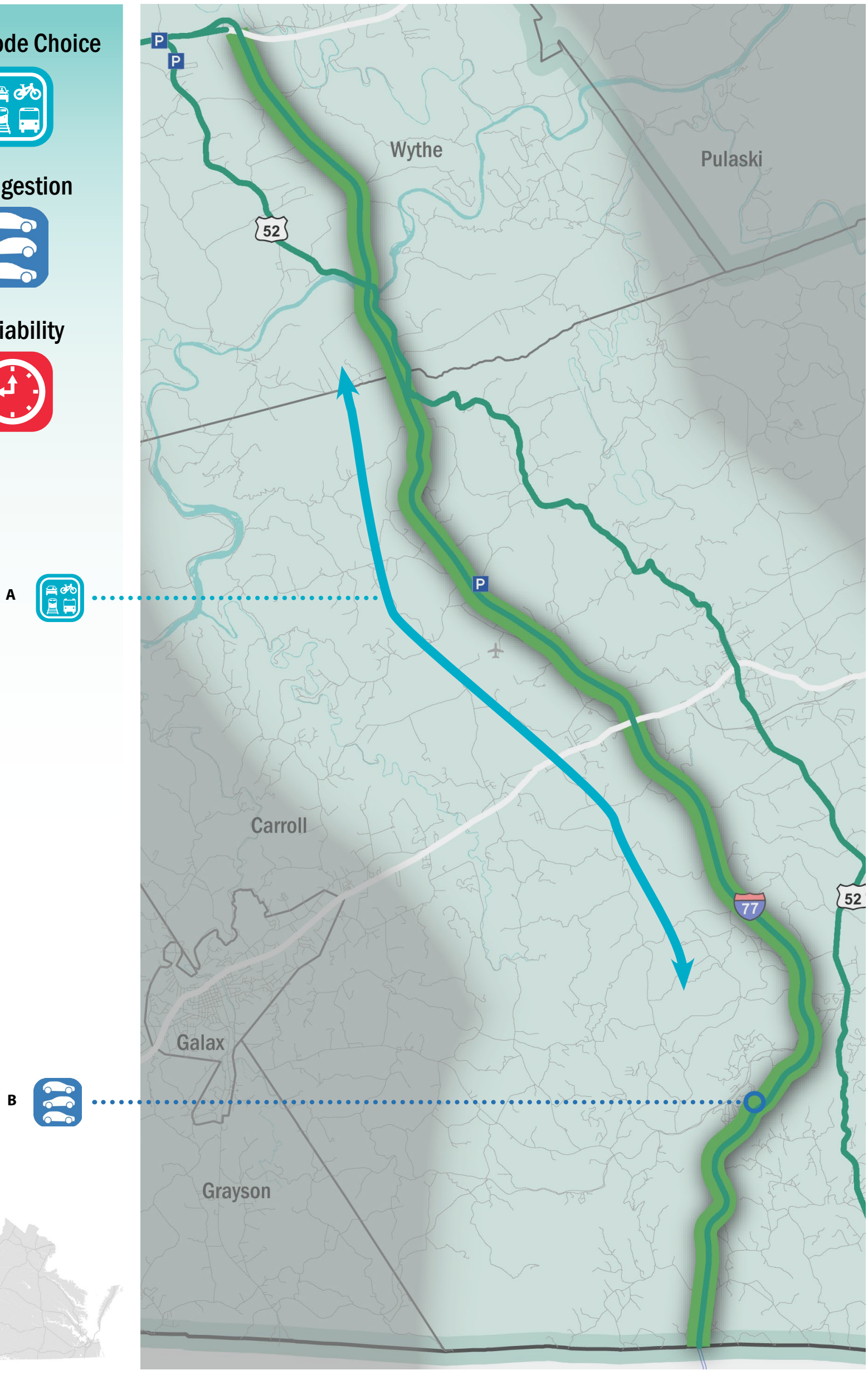
Mode Choice

Safety

Congestion

Bottlenecks

Reliability



L1 SEGMENT NEEDS

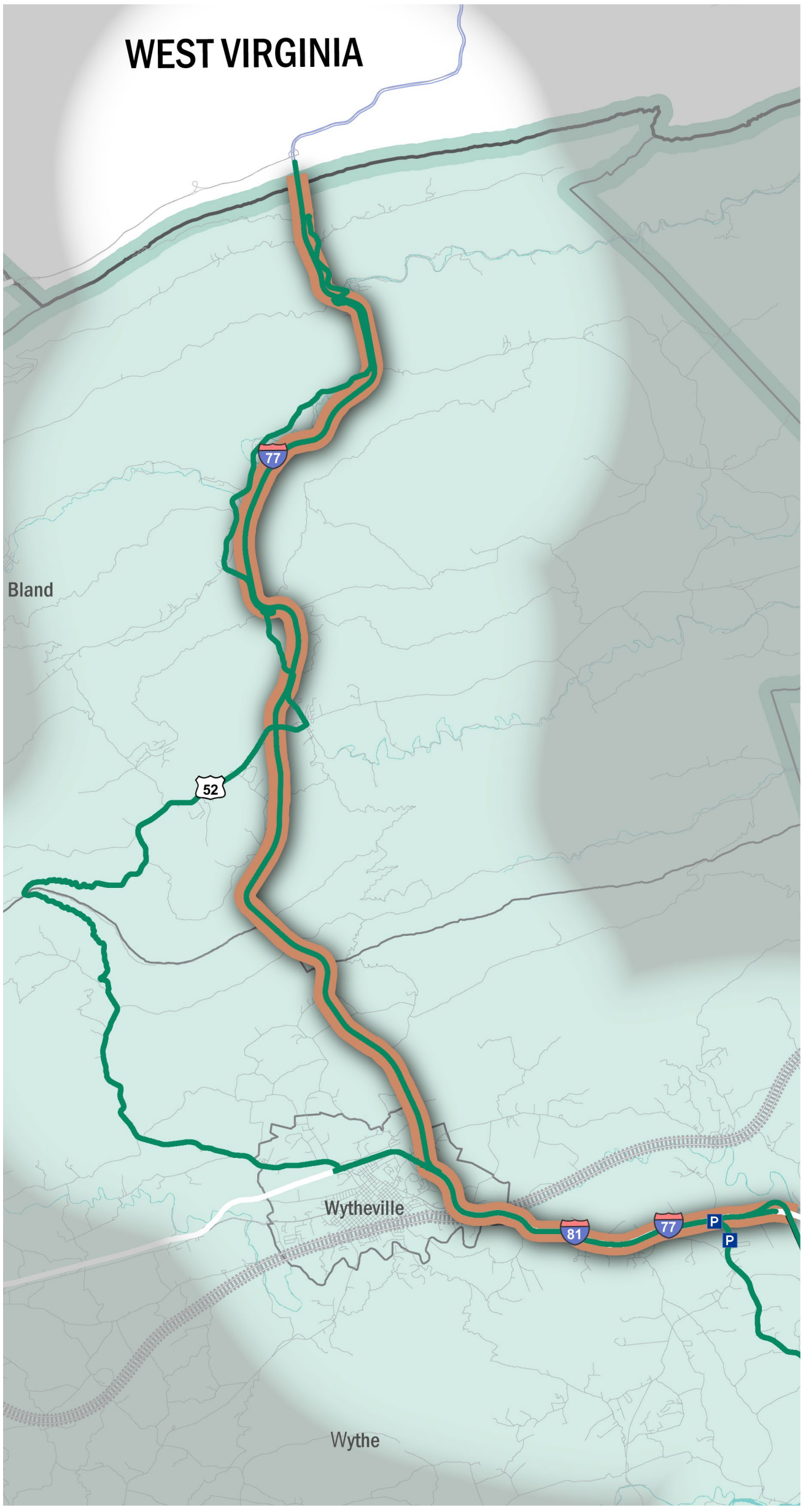
Summary of Needs - L1 Segment

A.		**Intercity bus service from Wytheville north only runs twice per day; no passenger rail service is available in the corridor**
B.		**Congestion issue on I-77 between Exit 1 (VA Route 620) and Exit 8 (VA Route 148) in Carroll County**

III. Segment L2

Corridor Segment L2 Components

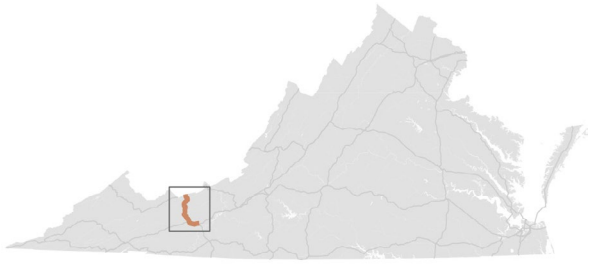
- I-77
- US 52
- Intercity bus service



Segment L2

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

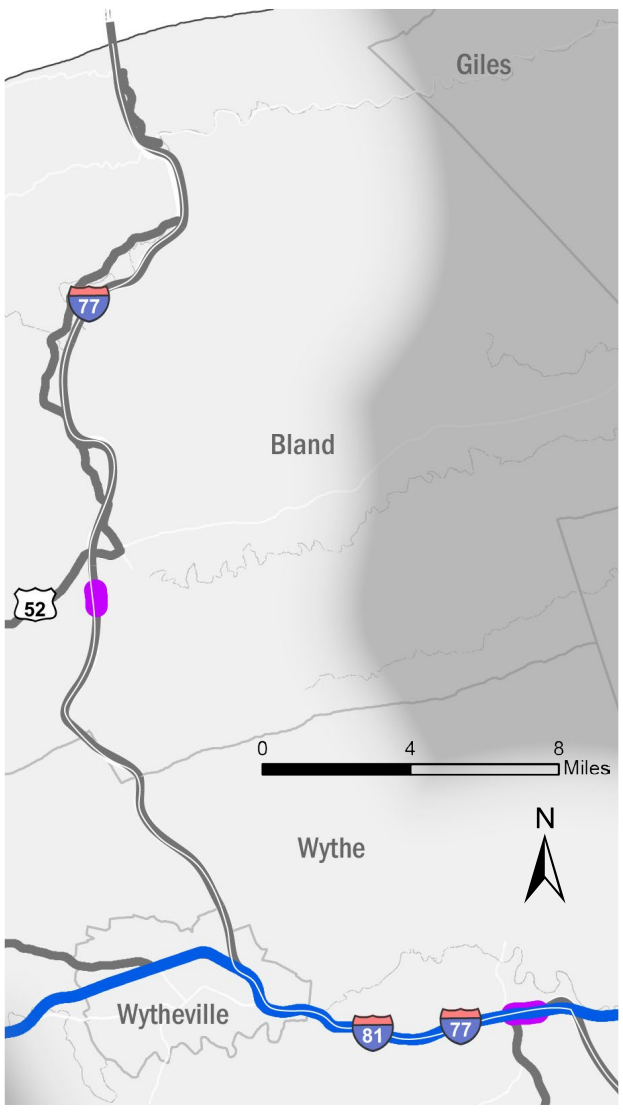
MPO Area
Planning District Area



L2 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 L2 begins at the eastern junction of I-77 and I-81 and follows I-81 into Wytheville, where it advances north to the West Virginia border. The segment serves Bland and Wythe Counties and does not travel through any areas covered by a Metropolitan Planning Organization (MPO). Segment L2 serves as an inter-state freight connection, linking North Carolina and South Carolina to West Virginia and the Midwest. The segment also provides a connection between West Virginia, the Midwest states, and freight facilities located within the I-81 corridor, including the Virginia Inland Port.

Highway Facilities: I-77 is primarily a rural highway with four lanes in Segment L2, except where I-77 runs concurrently with I-81/US 11 between Wytheville and Fort Chiswell. In areas of this segment where it does not run concurrently with I-77, US 52 serves as a parallel highway facility to I-77.

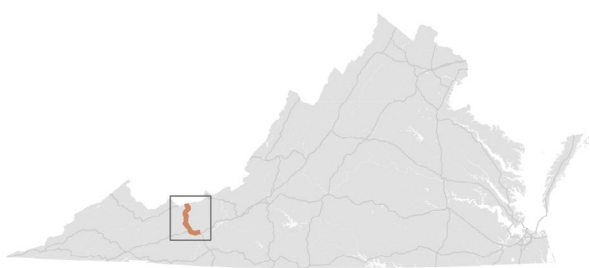
Transit Services: Greyhound provides bus service from a station in Wytheville. There are several Park-and-Ride locations located in Segment L2, clustered around Fort Chiswell.

Rail Facilities: Norfolk Southern's Crescent Corridor rail lines pass through Segment L2, providing connections north and south along Corridor B and the Virginia Inland Port, south of Winchester.

Port Facilities: Segment L1 does not provide direct connections to any port facilities, although it does run concurrently with I-81, which connects to the Virginia Inland Port.

Airport Facilities: There are no commercial airports located in Segment L2.

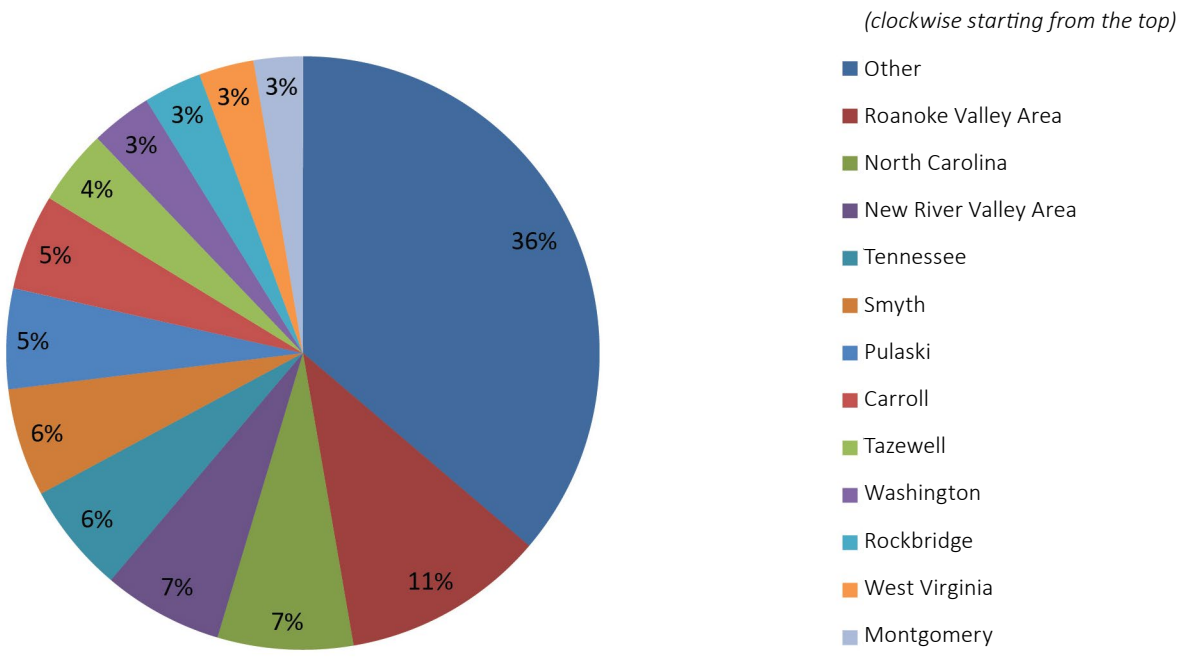
Major planned and future projects: There are no major planned projects to improve safety or increase capacity at this time.

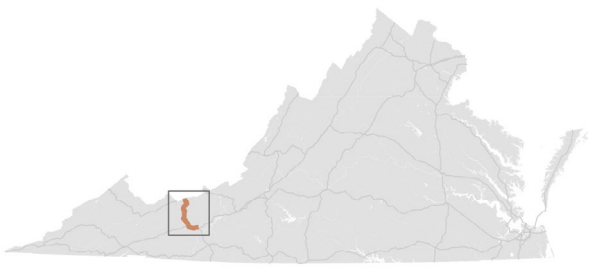


Travel Demand

Passenger Demand

Segment L2, the northern segment on Corridor L, connects West Virginia to Corridor B via Bland and Wythe Counties, although it does not provide direct access to any of the Commonwealth's MPO areas. Intercity passenger travel from these counties accounts for a small percentage of intercity travel in the Commonwealth (approximately 0.9 percent), but major markets for this travel include the Roanoke Valley Area (11 percent), North Carolina (seven percent), and the New River Valley Area (seven percent), all of which may use portions of Segment L1.





L2 SEGMENT PROFILE

Freight Demand

By truck, Segment L2 carried 56 million tons of freight worth $101 billion in 2012, and is estimated to carry 78 million tons of freight worth $148 billion in 2025. Truck freight patterns on this corridor are mostly interstate through-movements, with more than 76 percent of corridor freight tonnage and more than 87 percent of the corridor freight value, passing through Virginia. In terms of both tonnage and value, North Carolina is the largest generator and attractor of truck freight on Corridor L. The largest truck freight movements on Corridor L are between North Carolina and Ohio, accounting for six percent of the total freight tonnage and four percent of the total freight value on the corridor. Several of the largest truck freight flows on Corridor L are movements between the Midwest and Southeast regions. In terms of value, New York and Pennsylvania are major attractors of truck freight Corridor L, accounting for 15 percent of the total truck freight value on the corridor. Jurisdictions adjacent to Segment L2 are not major generators or attractors of truck freight on Corridor L, with less than one percent of the truck freight value originating from or destined for these jurisdictions. Wythe County is the largest generator of truck freight along Segment L2, accounting for two percent of the total truck freight tonnage originating on Corridor L.

Truck Freight

Major Origins (by Tonnage)
1. North Carolina (16% / 15%)
2. Virginia (14% / 12%)
3. Ohio (8% / 8%)
4. Pennsylvania (7% / 8%)
5. Tennessee (7% / 7%)

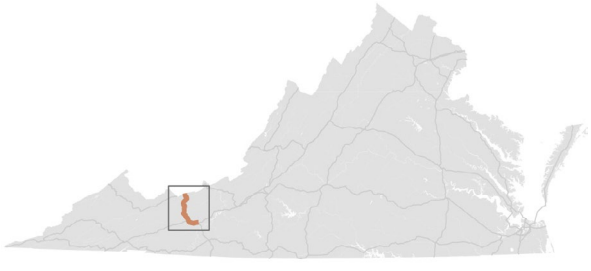
Corridor Tonnage Originating in Segment L2: 2% / 2%

Major Origin-Destination Pairs for Freight
North Carolina and Ohio
North Carolina and Pennsylvania
North Carolina and West Virginia
Ohio and Florida
Ohio and South Carolina

Percentages represent 2012 / 2025 values.

Major Destinations (by Tonnage)
1. North Carolina (17% / 18%)
2. Virginia (13% / 13%)
3. Pennsylvania (7% / 7%)
4. New York (6% / 6%)
5. Ohio (5% / 5%)

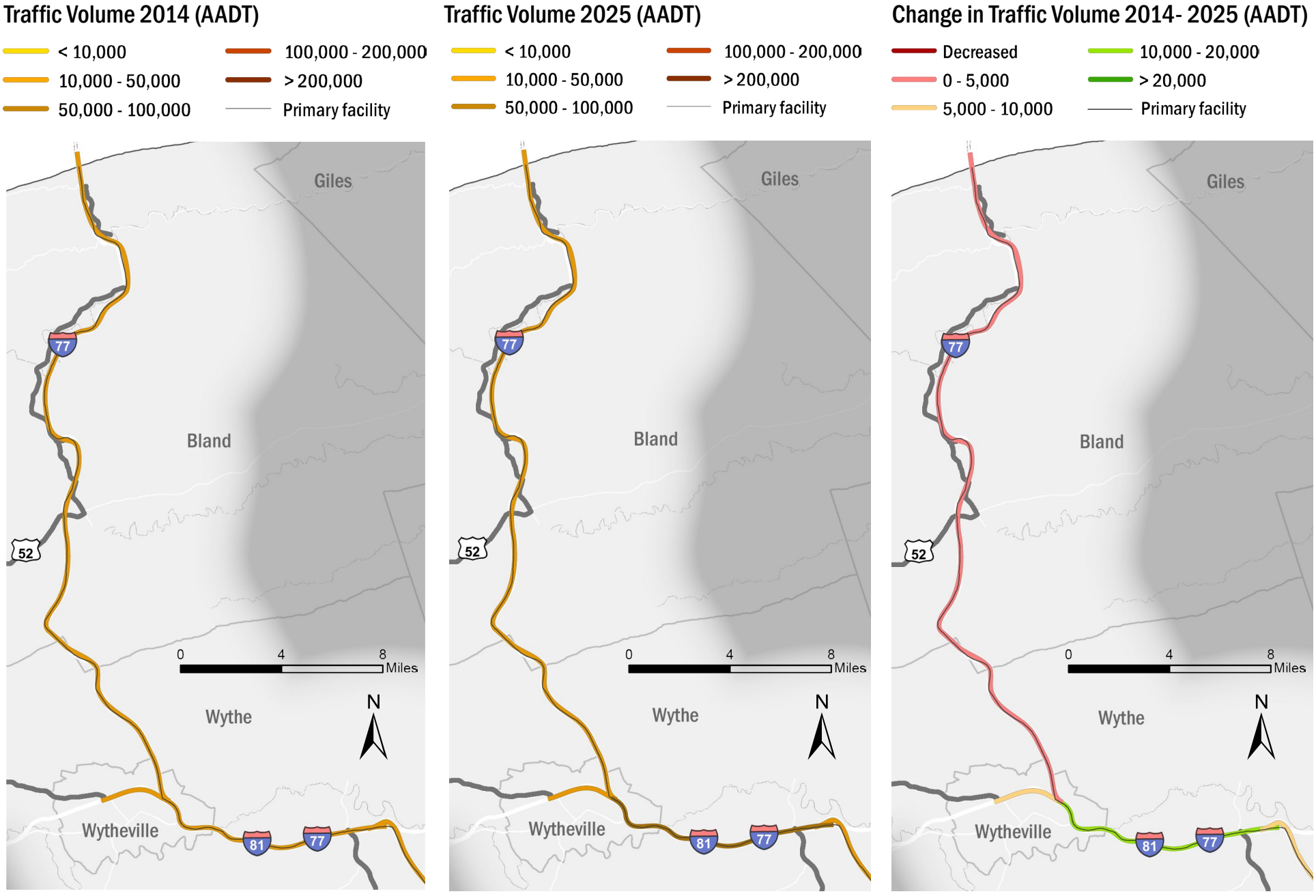
Corridor Tonnage Destined for Segment L2: <1% / <1%



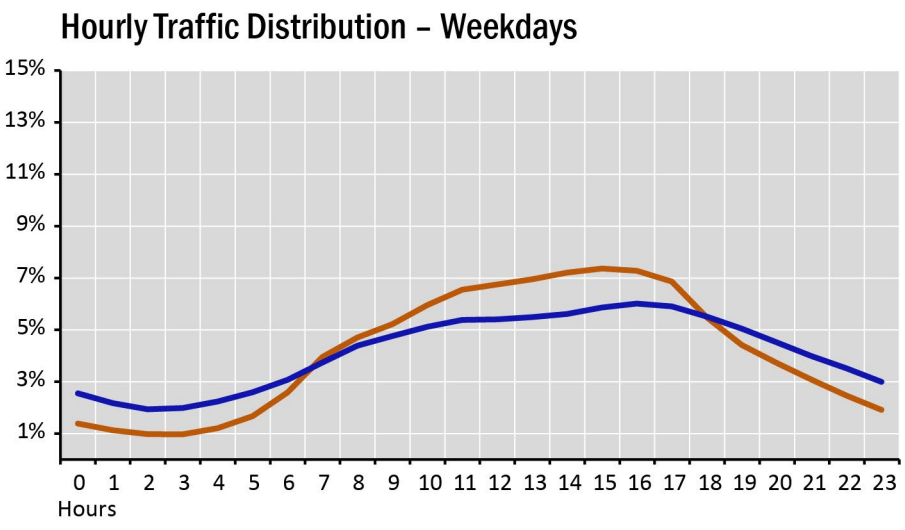
Traffic Conditions

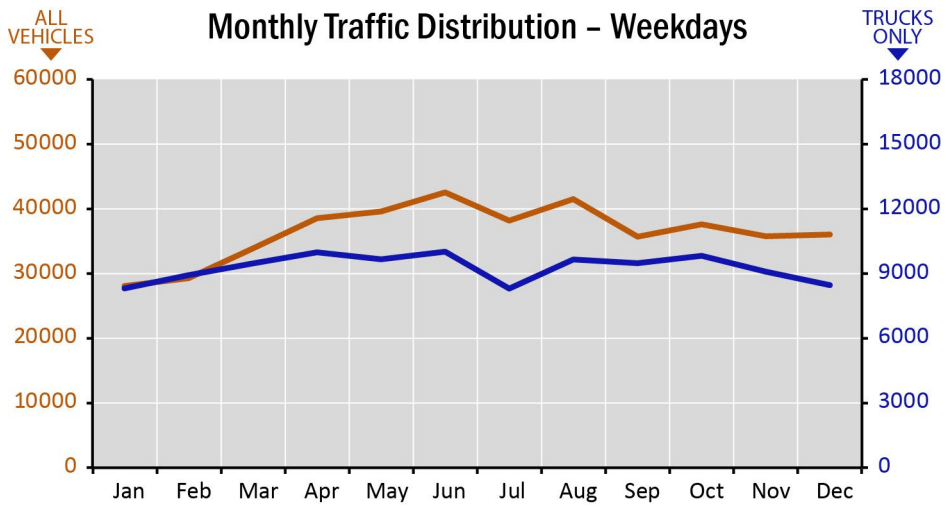
Traffic Volume and AADT

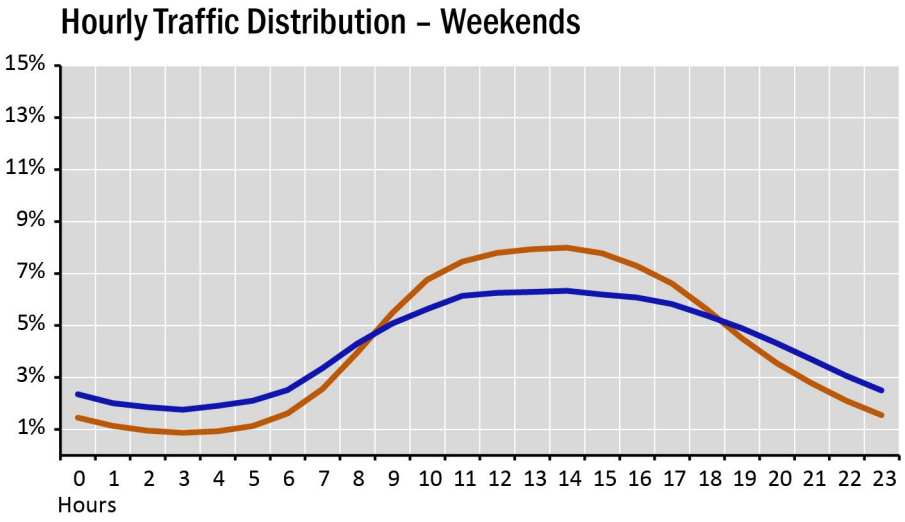
Traffic volume varies on Segment L2 depending upon location. Along the concurrent section of I-77/I-81 between Wytheville and Fort Chiswell, average daily traffic volume is approximately 47,000 vehicles. Along this section, daily traffic volumes are projected to increase by 11,000 vehicles by 2025. Along I-77 north of I-81, average daily traffic volume is approximately 24,000 vehicles. On this section of I-77 north of I-81, daily traffic volumes are projected to increase by approximately 3,000 vehicles by 2025.

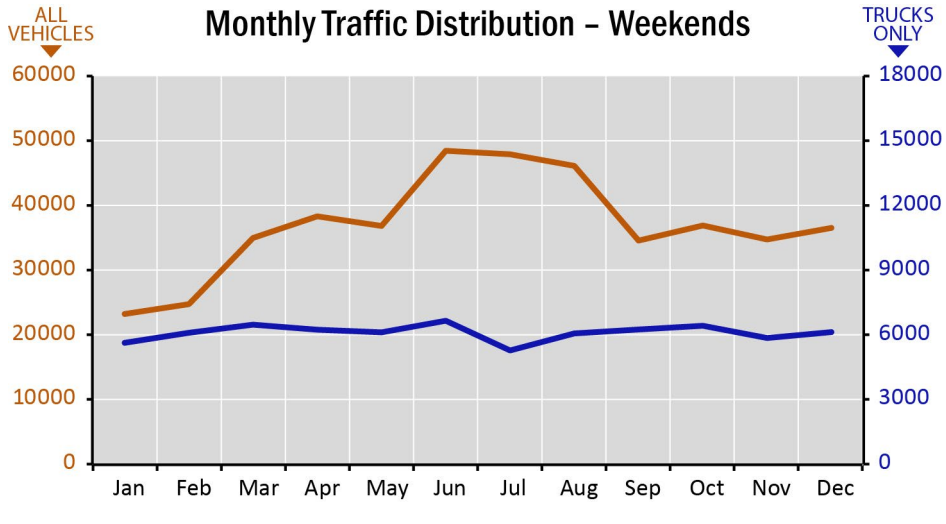


L2 SEGMENT PROFILE









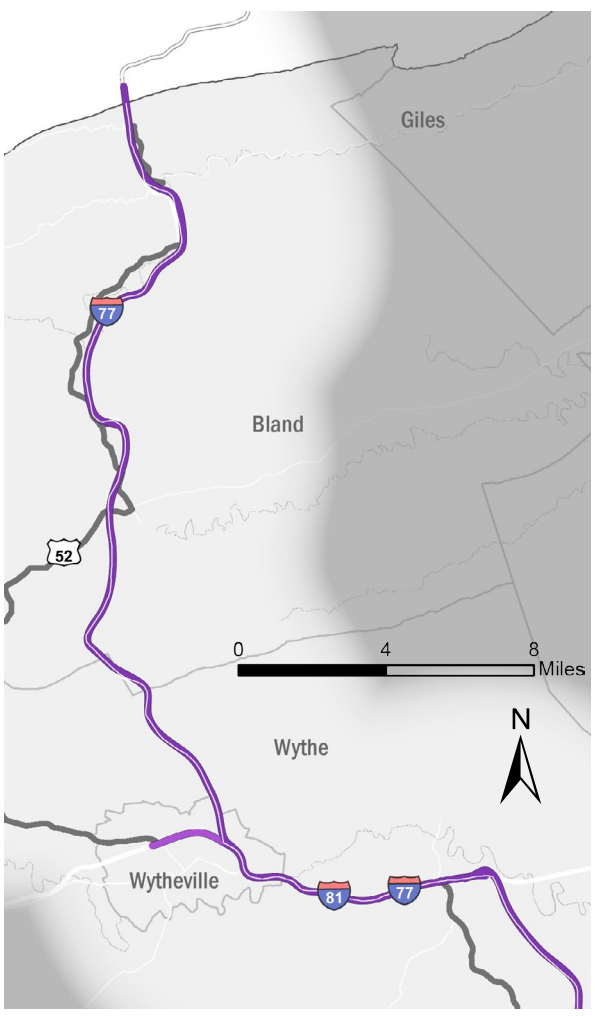
All Vehicles

Trucks

Traffic Distribution

On average, traffic on Segment L2 is distributed throughout the day as shown in the graphs below. Weekday traffic shows a single afternoon peak with the highest flow occurring between 3 and 4 p.m. The combined weekday traffic from the 7 a.m. to 7 p.m. period accounts for 74 percent of total daily traffic. Peaking patterns for truck traffic show a similar profile to overall weekday traffic, with a peak hour flow of 6.0 percent between 4 and 5 p.m. Weekend traffic patterns also show a single midday peak, with the highest percentage of hourly traffic occurring between 2 and 3 p.m. (8.0 percent for all traffic and 6.3 percent for truck traffic).

Weekday traffic volumes on Segment L2 vary by as much as 52 percent throughout the year, with the high point in June (around 42,000 vehicles per day) and the low point in January (around 28,000 vehicles per day). Truck volumes vary less than passenger volumes, with the June high (around 10,000 vehicles per day) 21 percent higher than the January low (around 8,300 vehicles per day). Weekend traffic levels also vary over the course of the year, and the highest levels of weekend traffic (June, around 48,000 vehicles per day) are 109 percent higher than January levels (around 23,000 vehicles per day). Weekend truck traffic is significantly steadier than all vehicle traffic, with the June high (around 6,600 vehicles per day) 26 percent higher than the July low (around 5,300 vehicles per day). Truck volumes account for a significant portion of traffic on Segment L2 (25 percent of overall daily traffic for weekdays and 16 percent of overall daily traffic for weekends); as a result truck traffic has an impact on overall traffic conditions.

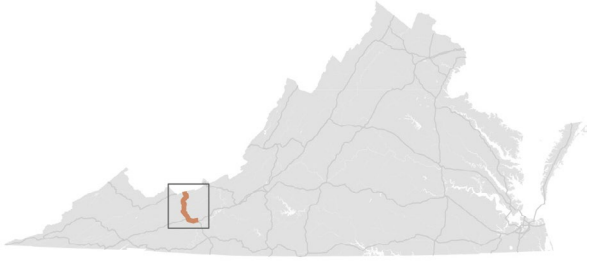


Percent Heavy Trucks

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

Truck Volumes

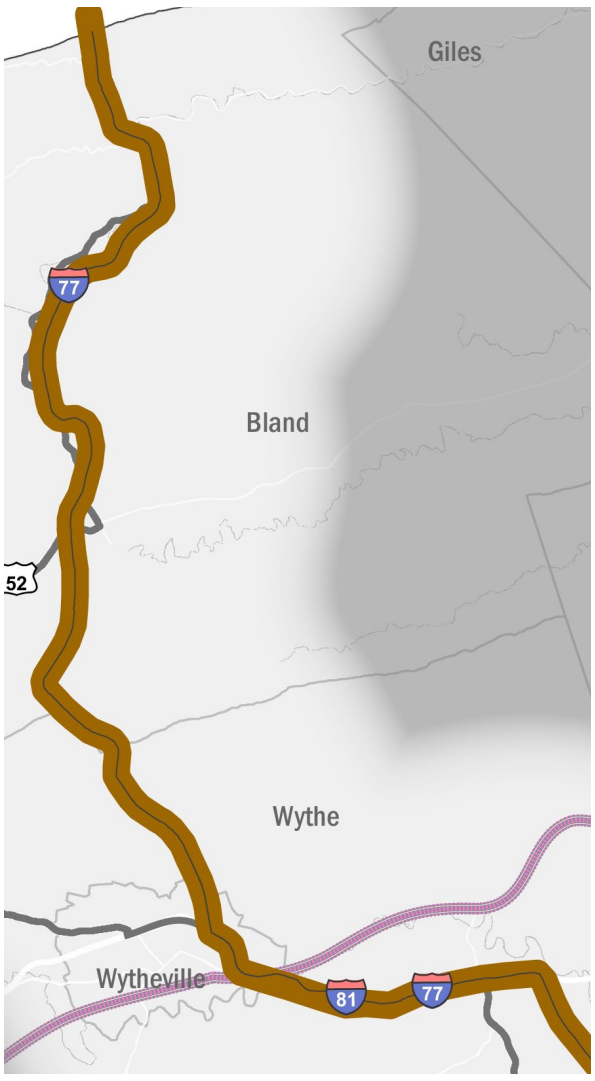
The percent of daily traffic comprised of heavy trucks on Segment L2 is lower than on Segment L1. Along the concurrent section of I-77/I-81, heavy trucks comprise 13 percent of truck traffic. Along I-77 north of I-81, heavy trucks account for 11 percent of total traffic.



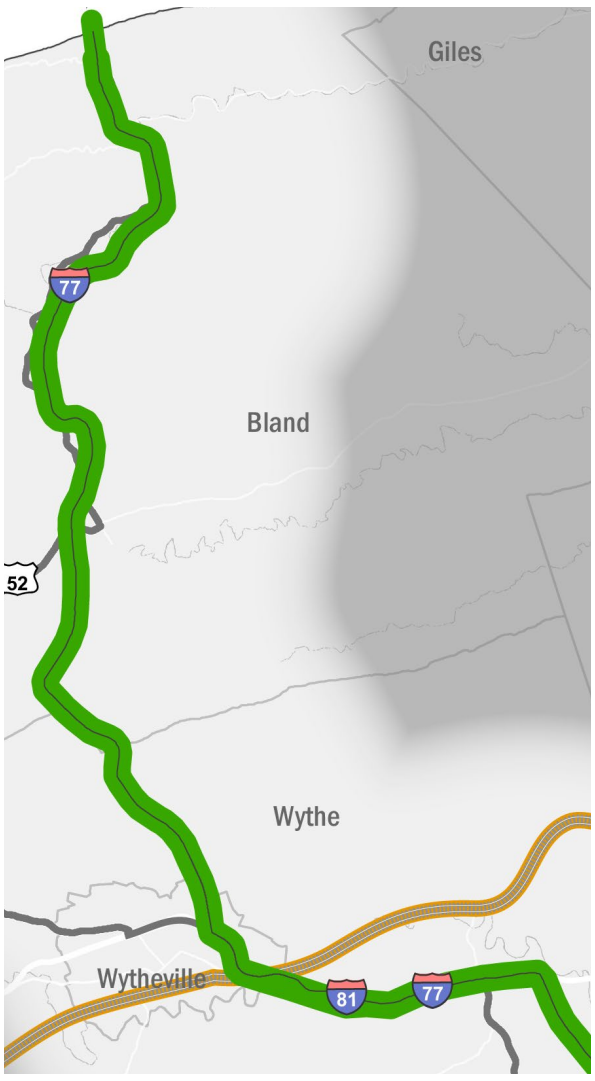
L2 SEGMENT PROFILE

Freight Flows

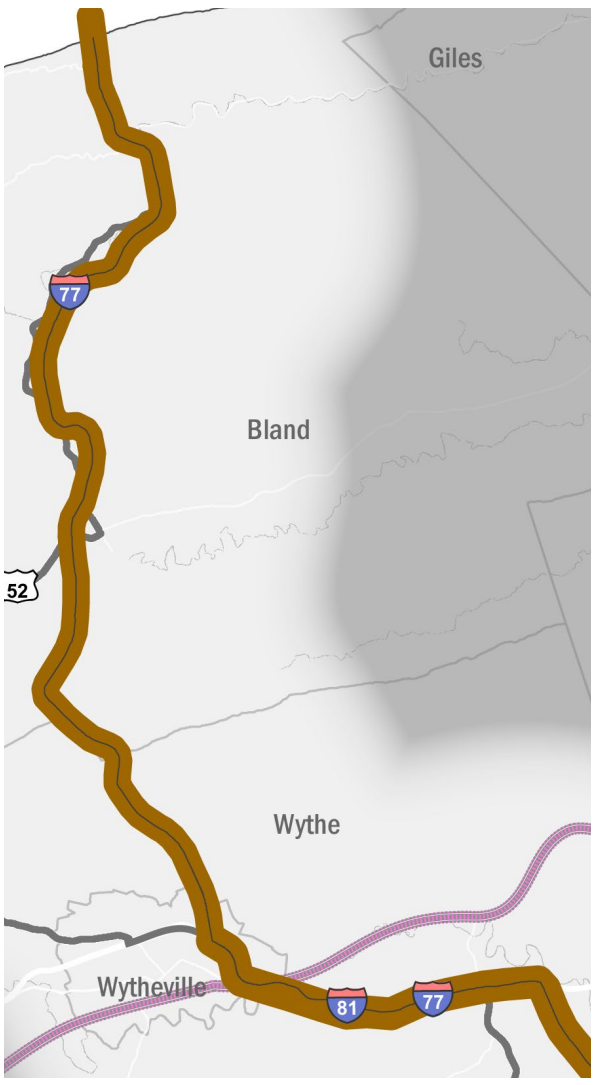
Freight on Segment L2 is moved only by truck as there is no rail link in the Western Mountain Corridor. In Bland County, 56 million tons of freight worth $100.5 billion is moved through this section of Segment L2 by truck. On average, a ton of freight traveling through this section of Segment L2 is worth $1,799. In 2025, truck freight tonnage and value in this area of Segment L1 will likely increase. It is anticipated that value per ton on trucks will increase to $1,911.



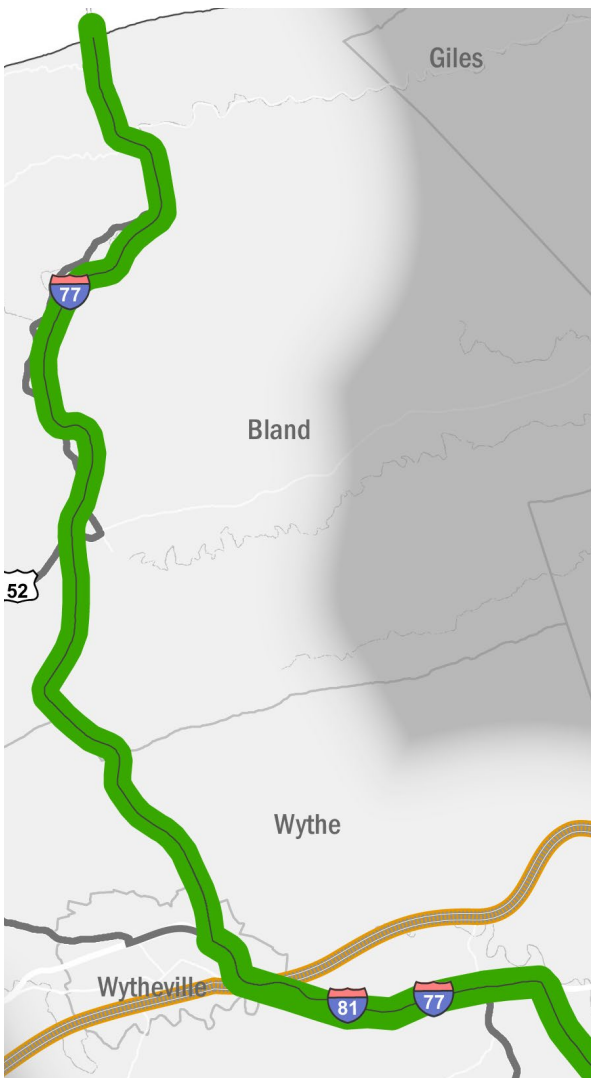
Annual Freight by Tonnage, 2012



Annual Freight by Value, 2012



Annual Freight by Tonnage, 2025



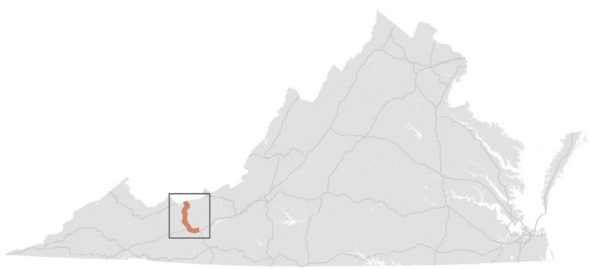
Annual Freight by Value, 2025

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 (Value)

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

Rail Freight (Value)

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

Redundancy and Mode Choice

Comparable Travel Options

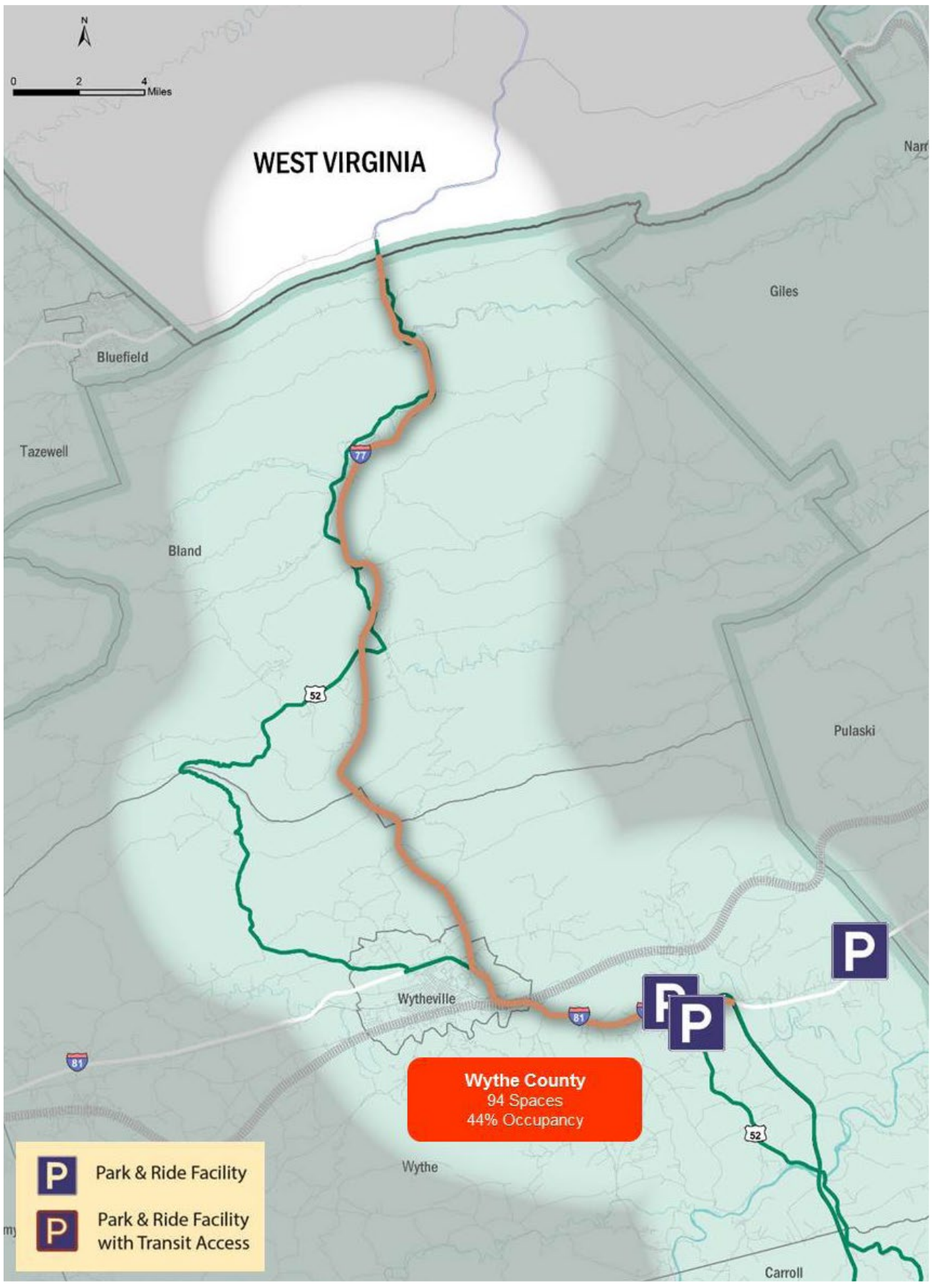
Beckley, WV to Wytheville

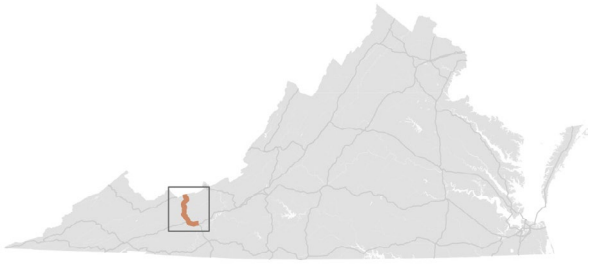
Inter-City Bus	Train	Auto
2 Trips per Day	0 Trips per Day	**Via I-77**: 1:20 Travel Time $41 Est. Cost
1:50 Travel Time	0:00 Travel Time	**Via Rt. 52**: 1:44 Travel Time $47 Est. Cost
$31 Est. Cost	$0 Est. Cost	

Passenger trips on Segment L2 of the Western Mountain Corridor have a limited range of travel options, both in terms of travel path and mode choice. While US 52 serves as a parallel facility, its use for long range travel is limited by speed and capacity; its function as a parallel facility is primarily for local access and bypassing incidents causing congestion on sections of I-77. Applying the 2014 federal standard mileage rate of 56 cents per mile, long-distance trips would be more expensive by automobile than by the available bus service. However, the Greyhound service from Wytheville, is limited by the frequency of service.

Park-and-Ride

Within Segment L2, commuters can utilize four Park-and-Ride locations in Wythe County. Wythe County's Park-and-Ride locations have a utilization rate of 44 percent, which is lower than the statewide average of 76 percent for Park-and-Ride utilization.



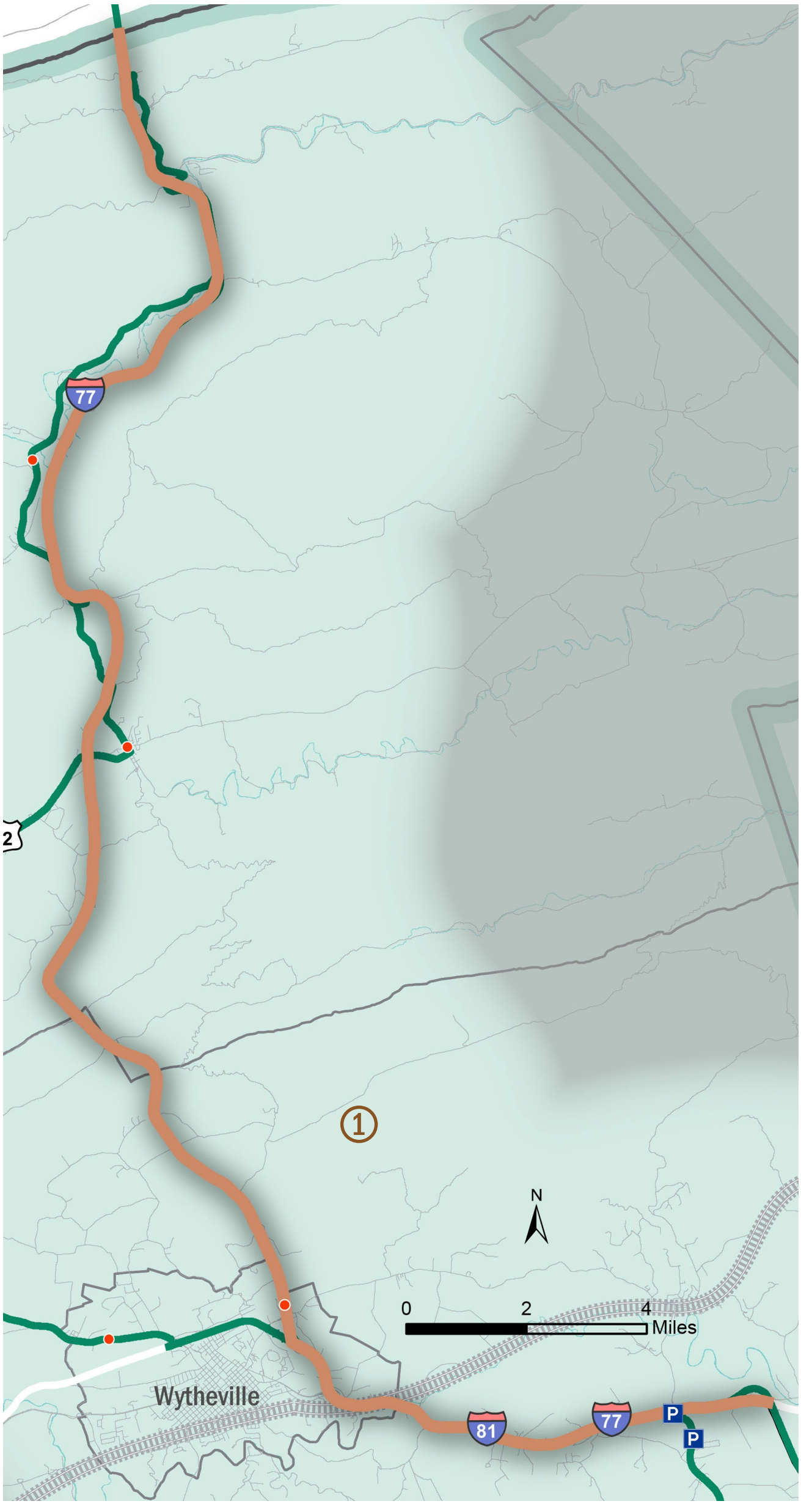


Safety

Performance Metrics:

Number of Severe Crashes	14
Severe Crashes/Million VMT	0.3
Number of Railroad Crashes	1

Between 2010 and 2012, 14 severe crashes occurred on Segment L2, clustered in four locations. On I-77 in Wytheville, there were four collisions over a 0.14-mile stretch at the on- and off-ramps to and from Peppers Ferry Road. On US 52 (North 4th Street) in Wytheville, there were three crashes over a distance of 1.25 miles between Mount Pleasant Road and Stafford Umberger Drive. In Bland County, two incidents took place at the intersection of US 52 (Main Street) and Route 42 (East Blue Grass Trail) and there were five crashes over 0.8 miles between Route 614 (Grapefield Road) and Round Mountain Road.

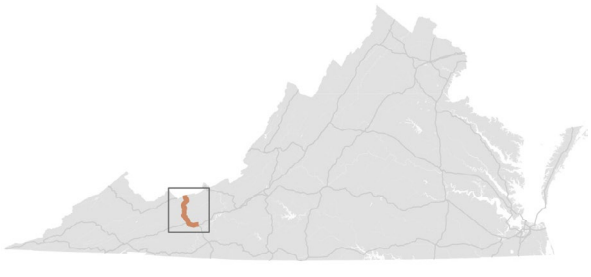


Fatality and Injury Crashes (2010-2012)

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

Railroad Incidents/Accidents per County (2011-2014)

#



Congestion

Performance Metrics

Person Hours of Delay per Mile	3
Freight Ton Hours of Delay per Mile	88.6K

Passenger Delays

Passenger delays along Segment L2 are among the lowest in the CoSS segments with daily delays of just 258 person-hours. Passenger congestion is minimal through most of the segment, with no locations experiencing delays of greater than 100 person-hours per mile. Peak-period passenger delays account for 36 percent of daily congestion, which is slightly less than the average for the peak-period share of congestion on CoSS segments.

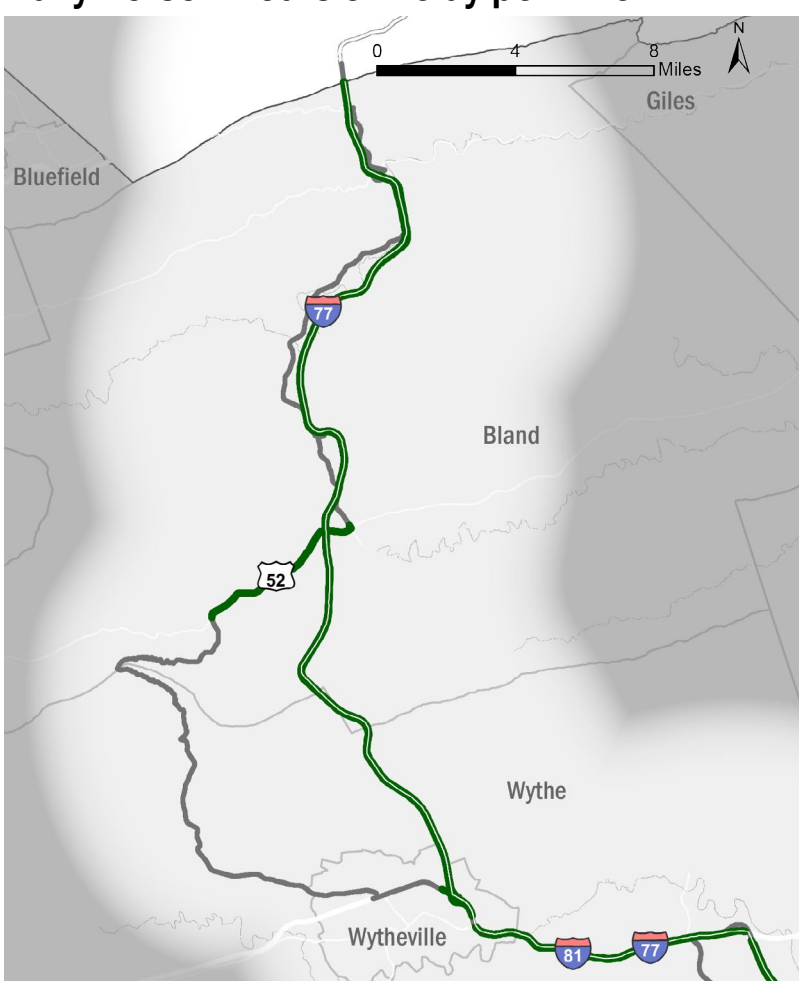
Freight Delays

Unlike passenger delays, freight delays are substantial on Segment L1, which is ranked as the second most congested freight segment in the CoSS with an average delay of over 88,000 ton-hours per mile. However, congestion on most of the corridor segment is minimal. There are significant freight delays, often exceeding 500,000 ton-hours per mile, in Bland County; locations include the following:

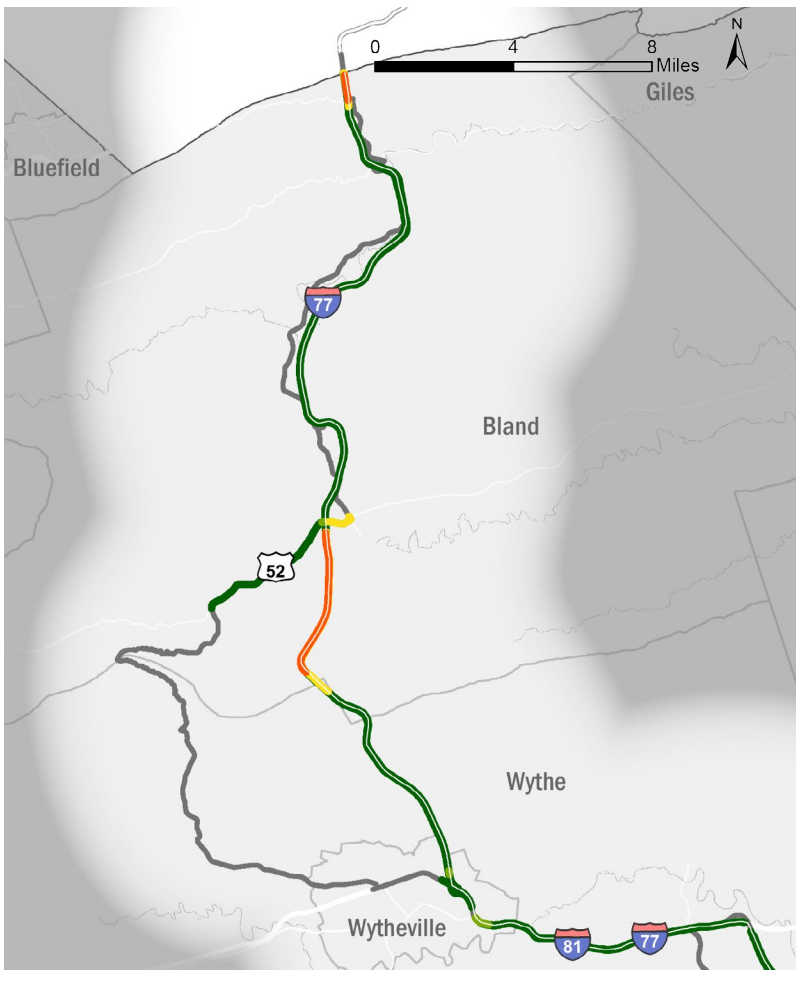
- I-77 between US 52/Route 42 and Route 717;
- I-77 near the West Virginia border; and
- US 52 near the interchange with I-77 near Bland.

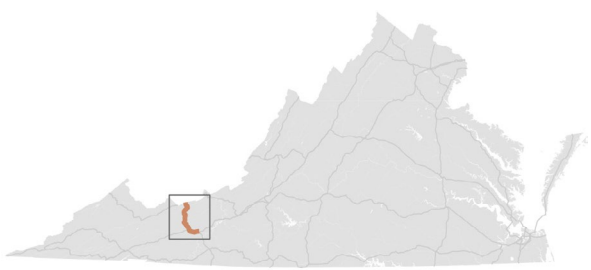
Peak-period freight delays account for 29 percent of daily congestion, which is slightly less than the average for the peak-period share of congestion on CoSS segments.

Daily Person Hours of Delay per Mile



Daily Freight Ton Hours of Delay per Mile





Reliability

Weekday Peak Reliability

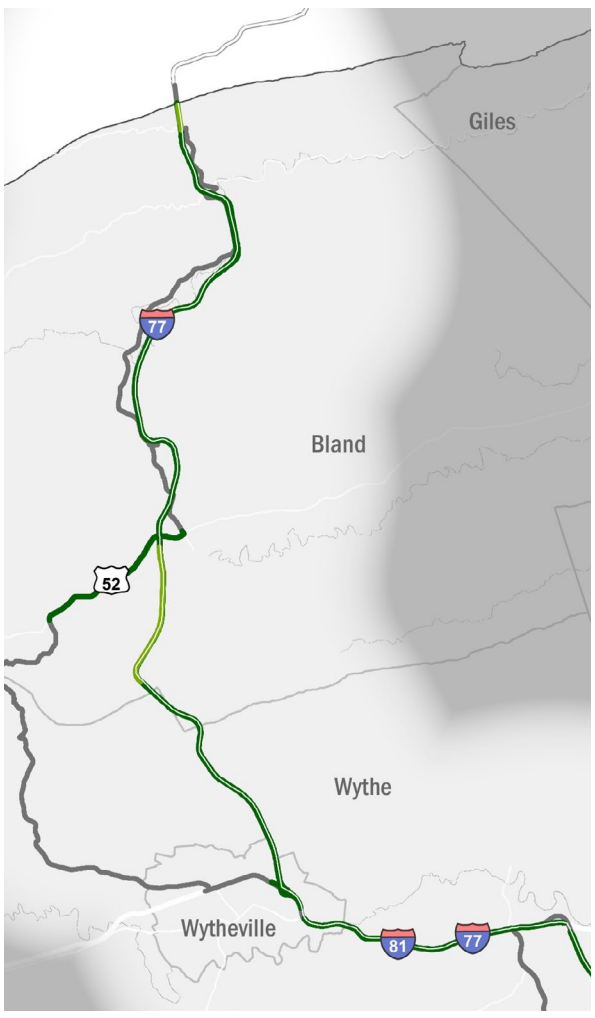
Reliability of travel during the peak period on a typical weekday on Segment L2 ranges from 0.00 to 0.22 in terms of reliability index, with an average value of 0.05. This segment has a peak period reliability index much lower than average for the CoSS segments statewide; therefore, none of the locations along Segment L2 have reliability index values exceeding the statewide threshold.

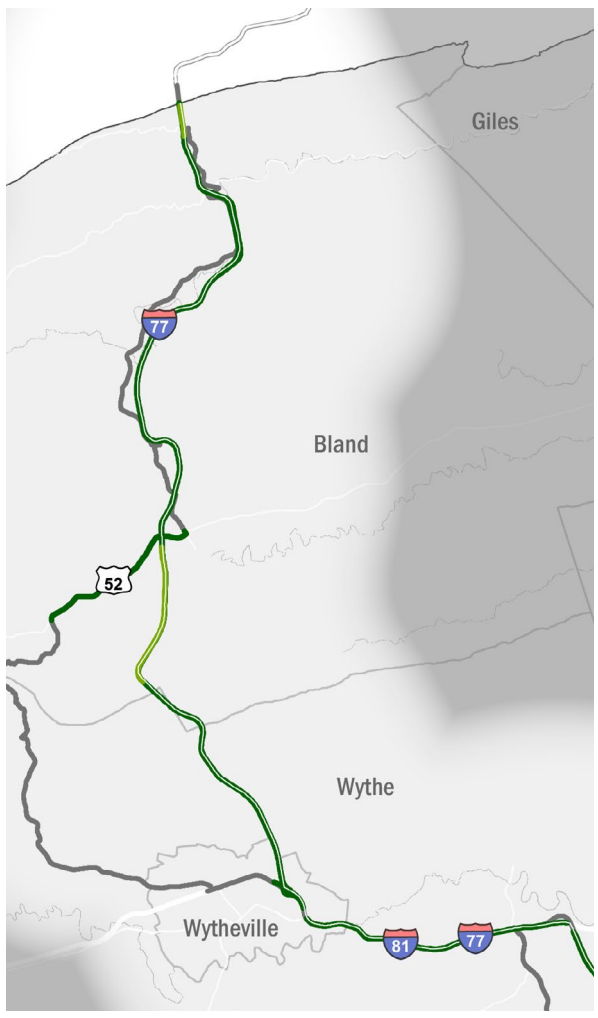
Weekday Reliability

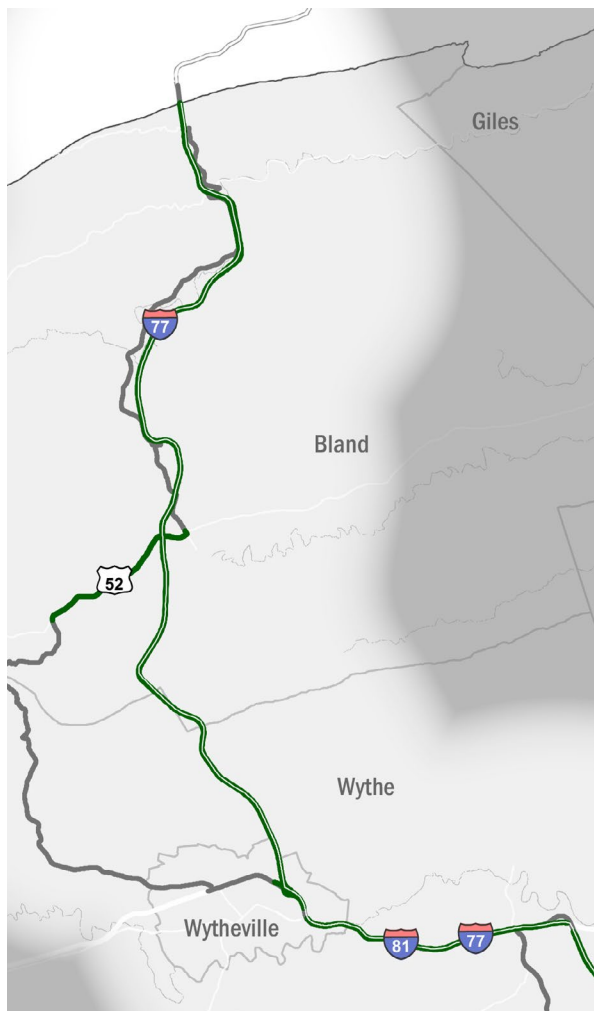
Reliability of travel during a typical weekday ranges from 0.02 to 0.27 in terms of reliability index, with an average value of 0.05. This segment has a weekday reliability index much lower than average for the CoSS segments statewide; therefore, none of the locations along Segment L2 have reliability index values exceeding the statewide threshold.

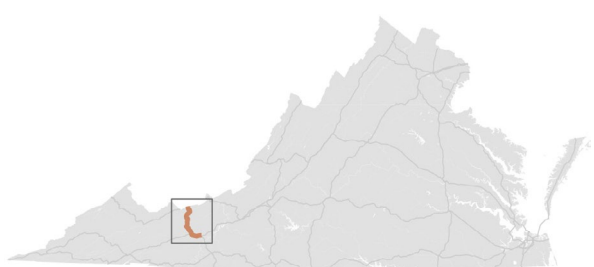
Weekend Reliability

Reliability of travel during a typical weekend ranges from 0.01 to 0.14 in terms of reliability index, with an average value of 0.04. This segment has a weekend reliability index much lower than average for the CoSS segments statewide; therefore, none of the locations along Segment L2 have reliability index values 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

L2 SEGMENT NEEDS

Summary of Needs

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

Mode Choice

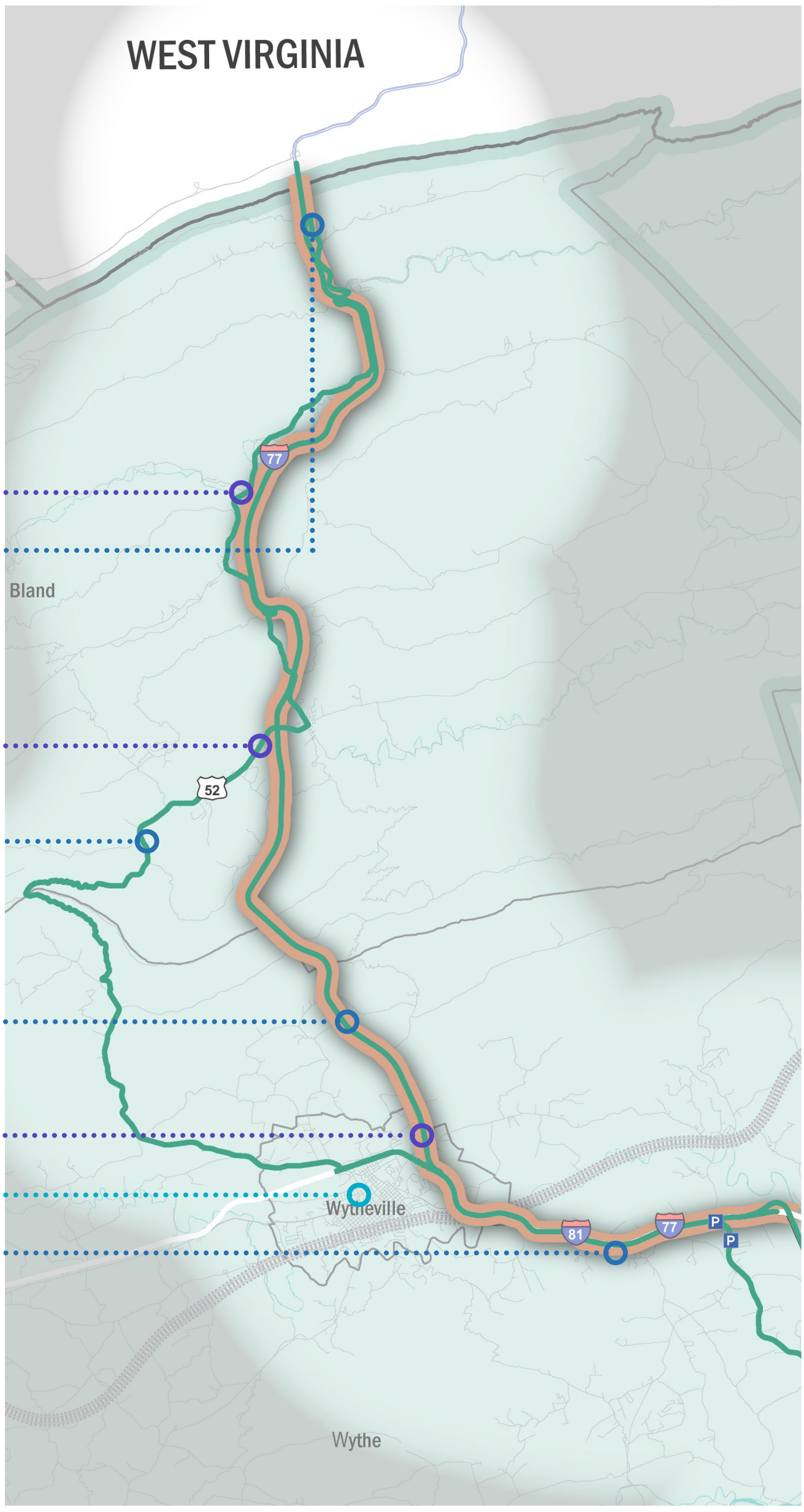
Redundancy

Safety

Congestion

Bottlenecks

Reliability



L2 SEGMENT NEEDS

Summary of Needs - L2 Segment

A.		Inadequate climbing lanes for trucks on I-81 through Wytheville can cause backups
B.		Seasonal traffic accessing beaches in the Carolinas causes major backups through Wythe County
C.		Intercity bus service from Wytheville north only runs twice per day; no passenger rail service is available in the corridor
D.		I-77 at Peppers Ferry Rd: 3 severe crashes
E.		US 52 at VA 42 in Bland County: 2 severe crashes
F.		US 52 near VA 614 (Grapefield Rd) in Bland County: 5 severe crashes
G.		Congestion issue on I-77 between Exit 47 (VA Route 717) in Wythe County and Exit 52 (US 52/VA Route 42) in Bland County
H.		Congestion issue on US 52/VA Route 42 between I-77 and VA Route 42 (East Blue Grass Trail) in Bland County
I.		Congestion issue on I-77 between West Virginia-Virginia border and Exit 66 (US 52) in Bland County