

Virginia's Future Mobility:

An Analysis of the Ability of Virginia's Transportation System
to Meet the State's Need for Safe and Efficient Mobility

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Founded in 1971, TRIP[®], of Washington, DC is a nonprofit organization that researches, evaluates and distributes economic and technical data on highway transportation issues. TRIP is sponsored by insurance companies, equipment manufacturers, distributors and suppliers; businesses involved in highway engineering, construction and finance; labor unions; and organizations concerned with an efficient and safe highway transportation network.

Executive Summary

A safe, efficient and reliable 21st Century transportation system is critical to Virginia's ability to accommodate further population and economic growth, while continuing to provide the state's residents with a high quality of life. Relieving traffic congestion, enhancing economic development opportunities and improving the condition of the state's roads and bridges at a time of continued, significant increases in vehicle miles traveled, remains a tremendous challenge for the state.

At current transportation funding levels, Virginia's residents and businesses can expect the state's roadways to become increasingly congested and deteriorated. Virginia's roadways are already aging and overburdened, while vehicle travel and population in the state continue to increase. Virginia's competitive advantage as a major transportation hub of the eastern U.S. may be threatened by increasing traffic congestion and the inability of the state to fund needed transportation infrastructure improvements.

TRANSPORTATION FUNDING:

Current transportation funding levels are insufficient to address needed maintenance and improvements on Virginia's highway transportation system, leading to increased roadway congestion and deterioration.

- Virginia faces a \$74 billion backlog through the year 2025 in unfunded highway improvements needed to relieve traffic congestion, enhance economic development, maintain the condition of roads and bridges and improve traffic safety.
- Needed but unfunded projects in Virginia include the widening of Interstate 81 and portions of Interstates 64, 66, 85, 95, 264, 395, 495, 581 and 664. Other needed but unfunded roadway improvement projects in Virginia include the construction of new roadway segments, including the Powhite Parkway in the Richmond area, the Tri-County Parkway in Northern Virginia, the Hampton Roads Third Crossing in the Hampton Roads area, Interstate 73 in South Central Virginia and the Coalfields Expressway in Western Virginia. A more complete list of projects can be found in the body of this report.
- Compounding this, by 2009, state highway funds will be insufficient to match federal highway funds, preventing the state from making full use of available federal dollars and reducing the overall amount of funds available to Virginia.
- The Virginia Department of Transportation (VDOT) projects that by 2014, all state construction funds will be used solely for maintenance of the existing system, leaving other needed projects and improvements unfunded.
- VDOT is currently transferring approximately \$400 million per year from funds allocated to new construction to its maintenance program.

- Virginia also faces a \$31 billion backlog through the year 2025 in unfunded projects to improve public transit in the state.
- The cost of highway construction materials – including asphalt, concrete, steel, lumber and diesel fuel – have increased by 33 percent in the last three years, increasing the cost of needed roadway and bridge repairs.

ECONOMIC DEVELOPMENT

Virginia’s competitive advantage as a major transportation hub of the eastern U.S. may be threatened by increasing traffic congestion and the inability of the state to fund needed transportation infrastructure improvements.

- With two critical ports in Norfolk and Richmond, Interstates 81 and 95 crossing the state, and Dulles International Airport serving air passengers and cargo, Virginia enjoys a significant economic advantage due to its extensive multi-modal transportation system.
- However, increasing congestion and the inability of the state to fund needed transportation infrastructure improvements may erode the economic advantage that Virginia currently enjoys.

CONGESTION

Traffic congestion levels in Virginia are rising as increases in population, vehicles and vehicle travel have placed additional stress on the state’s transportation system.

- Traffic congestion causes approximately 38 annual hours of delay for the average urban motorist in Virginia – nearly one full working week. Travel delays are likely significantly longer for motorists in some parts of the state.
- Vehicle travel on all of Virginia’s roads and highways increased by 33 percent from 1990 to 2005. During the same period, travel on Virginia’s major highways increased by 60 percent.
- TRIP estimates that vehicle travel in Virginia will increase by another 50 percent by the year 2025.
- In 2004, 30 percent of Virginia’s Interstate, primary and secondary roadways were considered congested. By 2025, 45 percent of the state’s roadways are expected to be congested unless the state’s roadways and public transit systems are expanded.
- Virginia’s population reached 7.6 million in 2005, an increase of 23 percent or 1.4 million people, since 1990. Virginia’s population is projected to increase by two million more residents by 2025, with most population growth concentrated in areas that are already heavily populated and also produce most of the state’s economic revenue.

- In 2004, 29 percent of Virginia's Interstate lane miles were considered congested. According to current projections, 79 percent of the state's Interstate lane miles will be congested in 2025.
- The current percentage of congested lane miles in each of Virginia's major urban areas is as follows: Northern Virginia – 58 percent; Roanoke – 27 percent; Hampton Roads – 23 percent; Richmond – 21 percent.

SAFETY

Nearly 4,700 people were killed on Virginia's roads in the last five years. Improving safety features on Virginia's roads and highways would likely result in a decrease in traffic fatalities in the state. Roadway design is an important factor in approximately one-third of fatal and serious traffic accidents.

- Between 2001 and 2005, 4,664 people were killed in traffic accidents in Virginia, an average of 933 fatalities per year.
- Highway improvements such as removing or shielding obstacles, adding or improving medians, adding rumble strips, wider lanes, wider and paved shoulders, upgrading roads from two lanes to four lanes and better road markings and traffic signals, where appropriate, can reduce traffic fatalities and accidents while improving traffic flow to help relieve congestion.
- The Federal Highway Administration has found that every \$100 million spent on needed highway safety improvements will result in 145 fewer traffic fatalities over a 10-year period.

ROADS

Less than half of Virginia's major roads and highways have pavements in good condition.

- Forty-three percent of Virginia's major roads are in good condition, significantly lower than the 75 percent for which state and local organizations strive.
- Approximately a quarter – 24 percent -- of Virginia's major roads are rated in substandard condition. This includes Interstates, highways, connecting urban arterials, and key urban streets that are maintained by state, county or municipal governments.
- Driving on roads in need of repair costs the average Virginia motorist approximately \$280 per year - \$1.4 billion statewide – in additional vehicle operating costs. These costs include accelerated vehicle depreciation, additional repair costs and increased fuel consumption and tire wear.

- The percentage of roadway miles in each urban area that are in substandard condition are: Roanoke – 22 percent; Northern Virginia – 17 percent; Hampton Roads – 11 percent; and Richmond – 9 percent.
- Roads rated in substandard condition often show signs of significant wear and may also have some visible pavement distress. Pavements in substandard condition can be repaired by resurfacing, but some may need more extensive reconstruction to return them to good condition.

BRIDGES

More than a quarter of the state’s bridges are structurally deficient or functionally obsolete, and approximately one-third are more than 50 years old. Significant bridge deficiencies exist in the state’s major urban areas.

- Twenty-six percent of the state’s bridges are rated deficient. Nine percent of Virginia’s bridges are rated as structurally deficient, showing significant deterioration to decks and other major components. Seventeen percent of Virginia’s bridges are functionally obsolete. These bridges no longer meet modern design standards for safety features such as lane widths or alignment with connecting roads or are no longer adequate for the volume of traffic being carried.
- The percentage of bridges that are in need of rehabilitation or repair in the state’s largest urban areas are: Northern Virginia – 19 percent; Richmond – 27 percent; Roanoke – 57 percent and Hampton Roads – 41 percent.
- Approximately one-third of the bridges in Virginia are at least 50 years old. Older bridges typically need significant repairs, reconstruction or replacement at approximately 50 years.
- Bridge deficiencies have an impact on mobility and safety. Restrictions on vehicle weight may cause many vehicles – especially emergency vehicles, commercial trucks, school buses and farm equipment – to use alternate routes to avoid these bridges. Narrow bridge lanes, inadequate clearances and poorly aligned bridge approaches reduce traffic safety. Redirected trips lengthen travel time, waste fuel and reduce the efficiency of the local economy.

Sources of information for this study include the U.S. Department of Transportation, Federal Highway Administration (FHWA), the U.S. Census Bureau, the National Highway Traffic Safety Administration (NHTSA), the National Bridge Inventory (NBI), the Bureau of Transportation Statistics (BTS), the Texas Transportation Institute (TTI), and the Virginia Department of Transportation and Development (VDOT)

Introduction

The ability of Virginia's system of roads and bridges to provide the state's residents and visitors with a high level of mobility is in jeopardy. As the backbone of Virginia's surface transportation system, roads and bridges play a central role in the state's economy and enable residents and visitors to go to work, visit family and friends, move goods to market, and frequent tourist attractions.

The continued modernization of Virginia's roads and bridges is crucial to providing a safer, more efficient transportation system, while improving the economic livelihood of the state and accommodating future growth. Projects designed to improve traffic flow and make driving safer, ultimately improve the state's level of mobility. And, as travel on Virginia's surface transportation system becomes more efficient, personal and commercial productivity increase, boosting economic development statewide.

Virginia must develop and maintain a modern transportation system that is safe, efficient, well preserved, and can accommodate future growth in population, vehicle travel and economic development. However, unless current transportation funding levels in the state increase, Virginia's residents, visitors and businesses can expect the state's roadways to become increasingly congested and deteriorated in the future. Virginia's roadways are already aging and overburdened, at a time when vehicle travel and population in the state are increasing rapidly. Current and projected transportation funding levels are insufficient to fund a variety of needed highway and transit projects that would relieve congestion and enhance economic development, traffic safety and quality of life in Virginia.

This report examines the condition, use, safety and funding of Virginia's roads and bridges, as well as the state's ability to meet future mobility and traffic safety needs. Sources of information for this study include the U.S. Department of Transportation, the Federal Highway Administration (FHWA), the U.S. Census Bureau, the National Highway Traffic Safety Administration (NHTSA), the Texas Transportation Institute (TTI), the National Bridge Inventory (NBI), the Bureau of Transportation Statistics (BTS) and the Virginia Department of Transportation and Development (VDOT).

Population and Travel Trends in Virginia

Increases in both the state's population and the rate of travel of its residents have created heightened demand on Virginia's transportation system, particularly its key highways and roads. It is critical that Virginia develop and maintain a modern transportation system that can accommodate future growth in population, vehicle travel and economic development.

Virginia's population reached 7.6 million in 2005, a significant increase of 23 percent or 1.4 million people since 1990 when the state's population was 6.2 million. Virginia's population is projected to increase by an additional two million residents by 2025, with most population growth concentrated in areas that are already heavily populated.¹

The number of cars and trucks in Virginia has also increased significantly since 1990. Between 1990 and 2005, the number of registered vehicles in Virginia increased by 33 percent, increasing by approximately 1.7 million, from 4.9 million vehicles in 1990 to approximately 6.6 million vehicles in 2005.²

Vehicle travel on Virginia's roadways increased by 33 percent from 1990 to 2005 – jumping from 60.2 billion vehicle miles traveled in 1990 to 80.3 billion vehicle miles traveled (VMT) in 2005.³

TRIP estimates that vehicle travel in Virginia will increase by 50 percent by the year 2025.⁴

Traffic Congestion in Virginia

Traffic congestion in Virginia is a growing burden in key urban areas and threatens to impede the state's economic development. Congestion on Virginia's urban highways is rising as economic and population growth leads to increased vehicle travel.

While vehicle travel on all of Virginia's roads increased by 33 percent from 1990 to 2005, travel on the state's highways (limited-access routes) increased by 60 percent from 1990 to 2005. Nearly a third – 30 percent – of Virginia's major roads and highways are considered congested, carrying traffic volumes that result in significant rush hour delays.⁵

These routes are considered congested because the levels of traffic they carry are likely to cause delays during peak travel hours as a result of traffic levels in excess of what the highway can carry without experiencing delays. Highways that carry high levels of traffic are also more vulnerable to experiencing significant traffic delays as a result of traffic accidents or other incidents.

In 2004, 29 percent of Virginia's Interstate lane miles were considered congested. By 2025, 45 percent of the state's roadways are expected to be congested.. According to current projections, 79 percent of the state's Interstate lane miles will be congested in 2025.⁶

Virginia’s major urban areas have experienced additional congestion in recent years. The following chart shows the percentage of Virginia’s urban area’s roads that are currently congested.

Chart 1: Percentage of roadways congested in Virginia’s urban areas

URBAN AREA	PERCENT CONGESTED
Northern Virginia	58%
Richmond	21%
Roanoke	27%
Hampton Roads	23%

Source: TRIP analysis of VDOT data.

Based on current traffic congestion levels, TRIP estimates that the average urban motorist in Virginia spends an additional 38 hours annually driving as a result of traffic congestion – the equivalent of spending an additional working week stuck in traffic.⁷

Economic Development and Transportation

With two critical ports in Norfolk and Richmond, Interstates 81 and 95 crossing the state, and Dulles International Airport serving air passengers and cargo, Virginia enjoys a significant economic advantage due to its extensive multi-modal transportation system.

However, Virginia’s competitive advantage as a major transportation hub of the eastern U.S. may be threatened by increasing traffic congestion and the inability of the state to fund needed transportation infrastructure improvements.

Traffic Safety in Virginia

A total of 4,664 people were killed in motor vehicle accidents in Virginia from 2001 through 2005, an average of 933 fatalities per year.⁸

Chart 2. Traffic fatalities in Virginia from 2000 – 2004.

Year	Fatalities
2001	935
2002	914
2003	943
2004	925
2005	947

Source: National Highway Traffic Safety Administration.

There are three major factors associated with fatal vehicle accidents: driver behavior, vehicle characteristics and roadway design. It is estimated that roadway design is an important factor in one-third of fatal and serious traffic accidents. Improving safety on Virginia's roads and highway system can be achieved through further improvements in vehicle safety; improvements in driver, pedestrian, and bicyclist behavior; and a variety of improvements in roadway safety features. Roadway improvements such as adding turn lanes, removing or shielding obstacles, adding or improving medians, widening lanes, widening and paving shoulders, improving intersection layout, and providing better road markings and upgrading or installing traffic signals, where appropriate, could reduce the severity of serious traffic crashes. The Federal Highway Administration has found that every \$100 million spent on needed highway safety improvements will result in 145 fewer traffic fatalities over a 10-year period.⁹

Roads with poor geometry, with insufficient clear distances, without turn lanes, inadequate shoulders for the posted speed limits, or poorly laid out intersections or interchanges, pose greater risks to motorists, pedestrians and bicyclists.

The following chart shows the correlation between specific needed road improvements and the reduction of fatal accident rates nationally:

Chart 3. Reduction in fatal accident rates after roadway improvements¹⁰

Type of Improvement	Reduction in Fatal Accident Rates after Improvements
New Traffic Signals	53%
Turning Lanes and Traffic Signalization	47%
Widen or Modify Bridge	49%
Construct Median for Traffic Separation	73%
Realign Roadway	66%
Remove Roadside Obstacles	66%
Widen or Improve Shoulder	22%

Source: TRIP analysis of U.S. Department of Transportation data

Condition of Virginia’s Roads

The lifecycle of Virginia’s roads is greatly affected by the state's ability to perform timely maintenance and upgrades to ensure that structures last as long as possible. The pavement condition of the state's major roads are evaluated and classified as being in poor, mediocre, fair or good condition.

In 2005 (the latest year for which data is available), 24 percent of Virginia’s major roads were rated in substandard condition.¹¹

Driving on roads in need of repair costs the average Virginia motorist approximately \$280 per year - \$1.4 billion statewide – in additional vehicle operating costs. These costs include

accelerated vehicle depreciation, additional repair costs and increased fuel consumption and tire wear.

Roadways in Virginia’s major urban areas are also showing signs of deterioration. The following lists the percentage of roadway miles in each urban area that are in substandard condition.

Chart 4. Percentage of roadways in substandard condition.

URBAN AREA	PERCENT SUBSTANDARD
Roanoke	22%
Northern Virginia	17%
Hampton Roads	11%
Richmond	9%

Source: TRIP analysis of Virginia Department of Transportation (VDOT) data.

Substandard roads often show signs of significant wear and may also have some visible pavement distress. Most substandard pavements can be repaired by resurfacing, but some may need more extensive reconstruction to return them to good condition. In Virginia, 43 percent of roads were rated in good condition in 2005, significantly lower than the recommended 75 percent for which state and local organizations strive.¹²

Pavement failure is caused by a combination of traffic, moisture and climate. Moisture often works its way into road surfaces and the materials that form the road’s foundation. Road surfaces at intersections are even more prone to deterioration because the slow-moving or standing loads occurring at these sites subject the pavement to higher levels of stress. It is critical that roads are fixed before they require major repairs because reconstructing roads costs approximately four times more than resurfacing them.¹³

Bridge Conditions in Virginia

Virginia's bridges form key links in the state's highway system, providing communities and individuals access to employment, schools, shopping and medical facilities, as well as facilitating commerce and access for emergency vehicles.

In 2005, the latest year for which data is available, 26 percent of Virginia's bridges (20 feet or longer) were rated as deficient.¹⁴ Nine percent of the state's bridges were rated as structurally deficient and another 17 percent were rated as functionally obsolete. A bridge is structurally deficient if there is significant deterioration of the bridge deck, supports or other major components. Bridges that are structurally deficient may be restricted to carrying lower weight vehicles or closed if their condition warrants such action. Deteriorated bridges can have a significant impact on daily life. Restrictions on vehicle weight may cause many vehicles – especially emergency vehicles, commercial trucks, school buses and farm equipment – to use alternate routes to avoid posted bridges. Redirected trips also lengthen travel time, waste fuel and reduce the efficiency of the local economy.

Bridges that are functionally obsolete do not meet current highway design standards, often because of narrow lanes, inadequate under-clearances or poor roadway approach alignment.

Approximately one-third of bridges in Virginia are at least 50 years old. Older bridges typically need significant repairs, reconstruction or replacement at approximately 50 years.¹⁵

Chart 5. Bridge Conditions in Virginia

BRIDGE CONDITION	NUMBER OF BRIDGES	PERCENTAGE OF BRIDGES
Structurally Deficient	1,192	9%
Functionally Obsolete	2,189	17%
Total Deficient Bridges	3,381	26%
Total Number of Bridges	13,248	

Source: National Bridge Inventory

TRIP also examined bridge conditions in Virginia's four major urban areas. The following chart indicates the total number of bridges in each urban area and the percentage of bridges that currently are in need of rehabilitation or repair.

Chart 6: Percentage of deficient bridges in Virginia's urban areas

URBAN AREA	NUMBER OF BRIDGES IN NEED OF REHABILITATION OR REPAIR	TOTAL NUMBER OF BRIDGES	PERCENT IN NEED OF REHABILITATION OR REPAIR
Northern Virginia	99	510	19
Richmond	93	346	27
Roanoke	153	267	57
Hampton Roads	56	135	41

Source: TRIP analysis of VDOT data.

Transportation Funding in Virginia

Current and anticipated future transportation funding levels are insufficient to address needed maintenance and expansion of Virginia's highway and public transit systems. Unless transportation investment in the state is increased, Virginians will face worsening traffic congestion and the state will be unable to realize its full potential for economic development as a result of inadequate mobility.

Virginia's current long-range transportation plan has found that the lack of adequate highway funding in Virginia has resulted in a \$74 billion backlog in unfunded but recommended roadway improvements in the state and a \$31 billion backlog in unfunded public transit improvements through the year 2025.¹⁶ Needed, but unfunded highway projects in Virginia include the widening of Interstate 81 and portions of Interstates 64, 66, 85, 95, 264, 395, 495, 581 and 664.¹⁷

Other needed but unfunded roadway improvement projects in Virginia include the construction of new roadway segments, including the Powhite Parkway in the Richmond area, the Tri-County Parkway in Northern Virginia, the Hampton Roads Third Crossing in the Hampton Roads area, Interstate 73 in South Central Virginia and the Coalfields Expressway in Western Virginia.

The following is a partial list of some of the needed, but currently unfunded, roadway improvement projects in Virginia. Numerous projects to widen existing state roadways are also listed by the state as being recommended and can be found in the state's 2025 State Highway Plan at <http://www.virginiadot.org/projects/pr-statehighwayplan.asp>.

Chart 7. Recommended Roadway Improvements in Virginia Currently Unfunded

Route	Region	Type of Improvement
Interstate 64	Central - Southeast	Widen 94 miles
Interstate 66	Northern Virginia	Widen 24 miles
Interstate 81	Western Virginia	Widen entire length
Interstate 85	Southern Virginia	Widen 7 miles
Interstate 95	Central Virginia	Widen 88 miles
Interstate 264	Hampton Roads	Widen 9 miles
Interstate 395	Northern Virginia	Widen 10 miles
Interstate 495	Northern Virginia	Widen 14 miles
Interstate 581	Western Virginia	Widen 7 miles
Interstate 664	Hampton Roads	Widen 21 miles
Powhite Parkway	Richmond	New 10-mile Roadway
Route 895 Connector	Richmond	New 1.3 mile Roadway
Hampton Roads Third Crossing	Hampton Roads	Connect I-664 and I-564
Tri-County Parkway	Northern Virginia	New 14-mile Roadway
Loudon County Parkway	Northern Virginia	New 5-mile Roadway
Coalfields Expressway	Western Virginia	New 27-mile Roadway
Windsor Bypass	Hampton Roads	Connection from Routes 689 to 638
Route 29 Bypass	Albermarle County	New 5-mile Roadway
Outer Connector	Stafford County	New 10-mile Roadway
Hillsville Bypass	Carroll County	New 2.7-mile Roadway

Source: VDOT's 2025 Long Range Plan

By 2009, Virginia's highway funds will be unable to match federal highway funds, preventing the state from making full use of available federal dollars and reducing the overall amount of funds available to Virginia. The Virginia Department of Transportation projects that by 2014, all state construction funds will be used solely for maintenance of the existing system, leaving no funding available for projects to widen existing highways or build new sections of roadways. VDOT is currently transferring approximately \$400 million per year from funds allocated to new construction to its maintenance program, reducing the number of needed new projects that could ease congestion and make the state's roads smoother and safer. ¹⁸

Another factor that will make it even more difficult for Virginia to fund needed roadway improvements is the escalating costs of materials used for highway construction. Over the last

three years, the average cost of materials used for highway construction, including asphalt, concrete, steel, lumber and diesel fuel has increased by 33 percent.

Conclusion

Virginia must develop and maintain a modern transportation system that is safe, efficient, well preserved that can accommodate future growth in population and vehicle travel, while enhancing economic development opportunities in the state. However, unless current transportation funding levels in the state increase, Virginia's residents, visitors and businesses can expect the state's roadways to become increasingly congested and deteriorated in the future. Virginia's roadways are already aging and overburdened, at a time when vehicle travel and population in the state are increasing rapidly. At this time, current and projected transportation funding levels are insufficient to fund a variety of needed highway and transit projects that would relieve congestion and enhance economic development, traffic safety and quality of life in Virginia.

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Endnotes

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- ¹ U.S. Census Bureau. www.census.gov
- ² TRIP analysis of Federal Highway Administration data. 1990, 2005 Highway Statistics, chart MV-1.
- ³ U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 2004.
- ⁴ TRIP estimate based on analysis of FHWA data.
- ⁵ Virginia's Statewide Multimodal Long-range Transportation Plan. Phase 3 and Final Report to the General Assembly. November 17, 2004. P. 94. Available at: www.vtrans.org
- ⁶ Virginia's Statewide Multimodal Long-range Transportation Plan. Phase 3 and Final Report to the General Assembly. November 17, 2004. Available at: www.vtrans.org
- ⁷ TRIP analysis based on data from the Federal Highway Administration and the Texas Transportation Institute.
- ⁸ U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 1999-2004 www.fhwa.dot.gov and www-fars.nhtsa.dot.gov.
- ⁹ Highway Safety Evaluation System, 1996 Annual Report on Highway Safety Improvement Programs, U.S. Department of Transportation.
- ¹⁰ Highway Safety Evaluation System; 1996 Annual Report on Highway Safety Improvement Programs; U.S. Department of Transportation.
- ¹¹ TRIP analysis of U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 2004.
- ¹² Why We Must Preserve our Pavements, D. Jackson, J. Mahoney, G. Hicks, 1996 International Symposium on Asphalt Emulsion Technology.
- ¹³ Selecting a Preventative Maintenance Treatment for Flexible Pavements. R. Hicks, J. Moulthrop. Transportation Research Board. 1999. Figure 1.
- ¹⁴ Federal Highway Administration – National Bridge Inventory.
- ¹⁵ Virginia's Statewide Multimodal Long-range Transportation Plan. Phase 3 and Final Report to the General Assembly. November 17, 2004. Available at: www.vtrans.org
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- ¹⁸ Virginia's Statewide Multimodal Long-range Transportation Plan. Phase 3 and Final Report to the General Assembly. November 17, 2004. Available at: www.vtrans.org