VIRGINIA'S STATEWIDE MULTIMODAL LONG-RANGE TRANSPORTATION PLAN

PHASE 3 AND FINAL REPORT TO THE GENERAL ASSEMBLY

NOVEMBER 17, 2004

Virginians envision a multimodal transportation system that is safe, strategic, and seamless.

Six long-range goals that reflect the values and perspectives held by Virginians across the state were identified to achieve the vision:

1. Provide a safe, secure, and integrated transportation system that reflects the diverse needs throughout the Commonwealth.

2. Preserve and manage the existing transportation system through technology and more efficient operations.

3. Facilitate the efficient movement of people and goods, expand travel choices, and improve interconnectivity of all transportation modes.

4. Improve Virginia's economic vitality and facilitate the coordination of transportation, land use, and economic development planning activities.

5. Improve environmental quality and the quality of life for Virginians.

6. Improve program delivery.

LETTER FROM THE SECRETARY

November 2004

To the Residents of Virginia:

Virginia has opened a new chapter in transportation planning. By initiating *VTrans2025*, a twenty-year long-range planning process that considers highways, transit, rail, air, pedestrian, port and bicycle facilities as part of ONE system, the Commonwealth is committed to creating a safer, more integrated, and efficient transportation network. Creating such a network is indispensable to the continued economic vitality of this great state.

VTrans2025 endorses a formal process to better ensure coordination among our transportation agencies. It is our goal that future planning for highways, public transportation, rail, aviation, port and bicycle facilities be more collaborative as we plan how best to solve mobility and congestion problems.

Drawing on the results of extensive public discussions and surveys, our four transportation agencies, through my office, have created a vision and developed a planning process that reflects public needs and expectations. In short, the 2025 vision for the Commonwealth is a transportation system that is ***SAFE***, ***STRATEGIC***, and ***SEAMLESS***.

Before we can move ahead to realize this vision, however, the Commonwealth must adopt policies that ensure adequate investment in the transportation network. Currently, the gap between needs and investment is growing at a distressing rate; demands for, and on, transportation facilities have increased as a result of population and employment growth, while inflation has eroded the purchasing power of the transportation tax dollar. If we are to provide a transportation system that will enable all regions of the state to prosper in the future, we must reverse this trend by making substantial new investments in transportation.

Although additional investment in transportation is crucial, we must continue to seek new ways to be more efficient and effective in how we use our limited transportation dollars. We must improve multimodal transportation planning by building project-level partnerships among the modes. We must maximize the use of existing resources through use of objective, performance-based criteria to ensure that limited funds are spent on projects that will achieve the greatest benefit. We must improve coordination among transportation agencies, local and regional planning bodies, and the public and other stakeholders to ensure that the transportation system we provide reflects the needs and desires of Virginians. We must actively pursue multimodal solutions that provide more travel choices and connections for Virginia's families, businesses and travelers. We must give priority to projects from all modes that ensure the safety and security of those who travel in and through Virginia and improve the quality of our environment and our diverse communities.

This report identifies policies and procedures that will help guide Virginia through the next twenty years. You might ask – *Why plan for such a distant future?* The answer is simple – *We cannot afford not to*. It takes years to plan and build new transportation infrastructure; in the meanwhile demands on the transportation system continue to accelerate. It is incumbent upon us to start planning for Virginia's bright future.

Sincerely,

Whittington W. Clement
Secretary of Transportation

PREFACE

Section 33.1-23.03 of the *Code of Virginia* (hereafter, the *Code*) directs Virginia's Commonwealth Transportation Board (CTB) to develop a multimodal long-range transportation plan with a statewide focus (see Appendix A). This plan, called *VTrans2025*, was developed in three phases through the Office of the Secretary of Transportation by the four state transportation modal agencies—Department of Aviation, Department of Rail and Public Transportation, Virginia Port Authority, and Department of Transportation.

Secretary of Transportation Whittington W. Clement established the *VTrans2025* Policy Committee, made up of the heads of each of the four modal agencies, CTB members, representatives from the Virginia Aviation Board (VAB) and the Virginia Port Authority (VPA) Board of Commissioners, and the Office of the Secretary of Transportation, to oversee development of *VTrans2025*. The *VTrans2025* Technical Committee, chaired by the Secretary's Office and composed of planning staff from each of the four modal agencies, was established to prepare this report to the General Assembly and other products associated with *VTrans2025*. This final report represents the Phase 3 deliverable identified in state legislation. *VTrans2025* is the product of the collaboration of many people, all of who played a significant role in its development. First are the thousands of people who participated in the public and stakeholder input program. These individuals brought the plan to life. A huge debt of gratitude is owed to everyone who took part in the public and stakeholder input process. This report was approved by the *VTrans2025* Policy Committee and presented to the CTB for review and submission to the Governor and General Assembly, as required.

VTrans2025 benefited from the assistance of a team of technical experts and policy makers, and this plan could not have been developed without their participation. The following agencies and organizations were represented on the *VTrans2025* Technical Committee:

- Federal Highway Administration (FHWA), Virginia Division
- Office of the Secretary of Transportation
- Virginia Association of Planning District Commissions (VAPDC)
- Virginia Department of Aviation (DOAV)
- Virginia Department of Rail and Public Transportation (DRPT)
- Virginia Department of Transportation (VDOT)
- Virginia Port Authority (VPA)

The following individuals served on the *VTrans2025* Policy Committee:

- Julia Connally, CTB Member, Chair
- Gerald McCarthy, CTB Member
- Hunter Watson, CTB Member
- Harry Lester, CTB Member
- James Keen, CTB Member
- Kenneth Klinge, CTB Member
- William Kehoe, VAB Member

- John Milliken, Chairman VPA Board of Commissioners
- Philip Shucet, Commonwealth Transportation Commissioner
- Karen Rae, Director DRPT
- Charles Macfarlane, Director DOAV
- Randall Burdette, Director DOAV
- Robert Bray, Executive Director VPA
- Ralph Davis, Deputy Secretary of Transportation for Intermodal Issues

VTrans2025 was also developed with the assistance of numerous groups who shared their expertise and talents to make this plan a true reflection of the future of multimodal transportation in Virginia:

- Cambridge Systematics
- Michael Baker Jr., Inc.
- Southeastern Institute of Research
- Virginia Commonwealth University Conflict Resolution Center
- Virginia Tech Institute for Policy Outreach and the University Transportation Fellow
- University of Virginia Center for Risk Management of Engineering Systems and Department of Systems Engineering
- Virginia Transportation Research Council
- Virginia's Planning District Commissions (PDCs)

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ADA	Americans with Disabilities Act
ASOS	Automated Surface Observation System
AWOS	Automated Weather Observation System
CAF	Commonwealth Airport Fund
CIMT	Craney Island Marine Terminal
CMAQ	Congestion Mitigation and Air Quality
CPF	Commonwealth Port Fund
CTB	Commonwealth Transportation Board
DOAV	Virginia Department of Aviation
DRPT	Virginia Department of Rail and Public Transportation
DUI	Driving Under the Influence
FHWA	Federal Highway Administration
FRANS	Federal Reimbursement Anticipation Notes
FTA	Federal Transit Administration
FY	Fiscal Year
GRTC	Greater Richmond Transit Company
HMOF	Highway Maintenance and Operating Fund
HOT	High Occupancy Toll Lanes
HOV	High Occupancy Vehicle
HRPDC	Hampton Roads Planning District Commission
ISTEA	Intermodal Surface Transportation Efficiency Act
ITS	Intelligent Transportation System
JLARC	Joint Legislative and Audit Review Committee
LOS	Level of Service
MAGLEV	Magnetic Levitation
MIN	Multimodal Investment Network
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NIT	Norfolk International Terminal
NNMT	Newport News Marine Terminal
NOx	Nitrogen Oxides
PDC	Planning District Commission
PM2.5	Fine Particulate Matter
PMT	Portsmouth Marine Terminal
PPTA	Public-Private Transportation Act
RTAP	Rural Transit Assistance Program
SATS	Small Aircraft Transportation System
SERP	State Environmental Review Process
SPS	Statewide Planning System
STC	Smart Traffic Center
STP	Surface Transportation Program
TDM	Travel Demand Management
TEA-21	Transportation Equity Act for the 21st Century
TEOC	Transportation Emergency Operations Center

TTF	Transportation Trust Fund
VAB	Virginia Aviation Board
VATSP	Virginia Air Transportation System Plan
VDOT	Virginia Department of Transportation
VIT	Virginia International Terminals
VMT	Vehicle Miles of Travel
VOC	Volatile Organic Compounds
VPA	Virginia Port Authority
VRE	Virginia Railway Express
VSP	Virginia State Police
WMATA	Washington Metropolitan Area Transit Authority

REPORT SUMMARY

Virginians are grappling with increased congestion on the roads, under-funded transit systems, missed opportunities for rail, and inadequate resources to meet infrastructure needs. In this stressed environment, the General Assembly mandated development of a comprehensive long-range multimodal plan that considered projects and policies that "promote economic development, intermodal connectivity, environmental quality, accessibility for people and freight, and transportation safety." The long-range plan was to review revenue sources and availability and recommend improvements in the multimodal transportation system to meet Virginia's long-term needs.

Building on recent successes in restoring accountability and instituting sound business practices in transportation agencies, Virginia's long-range transportation plan, called *VTrans2025,* is a blueprint for shaping the transportation future. It establishes a commonly held vision, goals, and objectives to guide and direct decision-making across transportation modes. It identifies the need for more resources to achieve the vision and provides a framework for multimodal investments.

A Policy Committee, composed of the heads of each transportation agency and members from each of the agency boards, guided the work of a Technical Committee, made up of experts from each of the agencies, as well as the Federal Highway Administration and the state's Planning District Commissions. Stakeholder groups and the public were invited to participate in developing the plan, and a series of 40 forums and focus groups were held around the state. Values and perspectives were obtained from these meetings and a statistically valid telephone survey was performed to determine the opinions of Virginians.

Vision for the Future of Transportation

Participants in the planning process said they wanted a safe, efficient, and modern network of transportation facilities and services that provided reliable travel for residents, visitors, and businesses; encouraged economic development; respected the environment; and, enhanced the quality of life in Virginia. They believed investments needed to be strategic, focusing on relieving congested conditions and improving connectivity and mode linkages. The public also expected full accountability and prudent and efficient use of taxpayer dollars.

Safety was a top concern and would not be traded-off for any other goal. Furthermore, Virginians did not want to sacrifice the environment for transportation improvements. Yet, congestion was a major concern, particularly in urban areas, where more transportation choices, non-highway alternatives, and increased capacity were considered solutions to congested highways.

Virginians wanted travel modes to be better connected, trips to be seamless, and linkages between existing systems and services to be improved. There was a strong interest in providing more balance in planning and investing across transportation modes. Virginians supported increasing investment in transportation, as long as they had greater involvement in transportation planning and assurances that revenues raised for transportation would be used only for transportation purposes.

The following vision statement reflects the consensus regarding the future transportation system:

Virginians envision a multimodal transportation system that is safe, strategic, and seamless.

Transportation Needs and Revenues

Based on detailed needs assessments by the four transportation agencies: DOAV, DRPT, VDOT, and VPA, transportation needs over the 2005-2025 period are expected to exceed $203 billion. Best estimates of available revenues are $95 billion, resulting in unmet needs exceeding $108 billion.

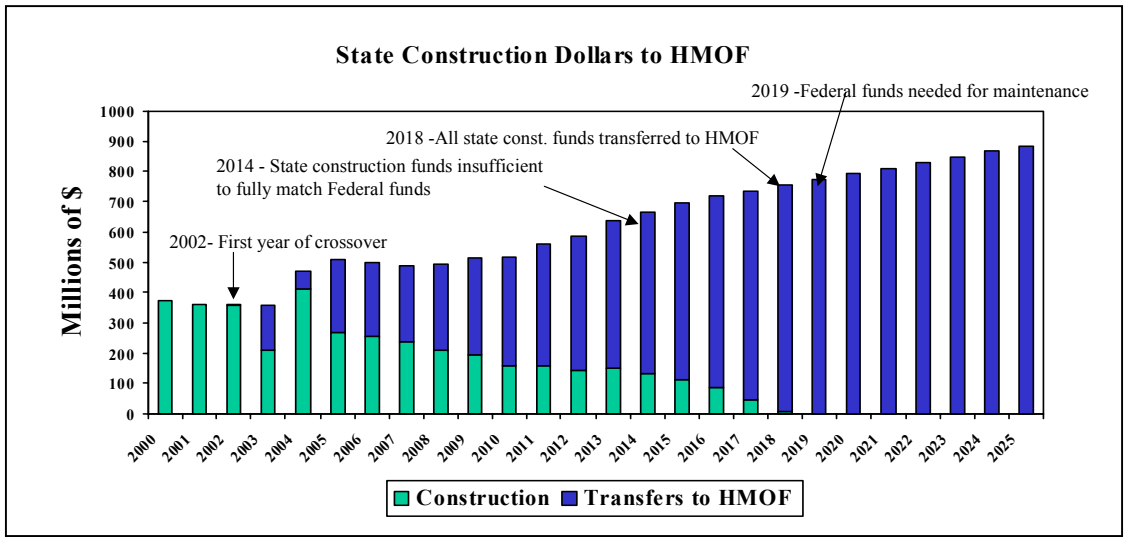
Virginia law requires that maintenance of the transportation system be funded before capital improvements; as a result, monies from the highway construction fund were first shifted to maintenance in 2003. Maintenance costs of the aging infrastructure continue to increase by approximately 4 percent per year, meaning that more and more, highway construction funds will be required to address system maintenance.

Total Unmet Transportation Needs 2005-2025 (Billions)

Highways	$74.2
Rail/Public Transp.	$30.7
Aviation	$3.1
Ports	$0.4
Total	**$108.4**

As shown in Figure 1, by 2014, the 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. By 2018, all of state construction funds will be used for maintenance. Federal highway funds will have to be used for maintenance beginning in 2019, further decreasing the funds available for construction purposes. Worse still, only about 20 percent of urban and secondary lane miles are eligible for federal funds.

FIGURE 1. HIGHWAY CONSTRUCTION FUNDS REQUIRED FOR MAINTENANCE



To alleviate the above trends, it is estimated that a minimum additional investment of $925 million per year for highways alone will be required to enable the state to fully match federal revenues and keep the highway construction fund whole over the 2005-2025 period. Higher maintenance costs and additional federal funding that requires increased state matching funds would push investment needs higher. Furthermore, consideration of the needs of the other modes will add substantially to the annual investment needed.

Additional analysis of the availability of revenues for highway funding, shown in Figure 2, shows that current highway funding levels are insufficient *even* to complete the highway projects identified in the *current* Six-Year Program.

FIGURE 2. TOTAL ESTIMATED REVENUES AVAILABLE FOR HIGHWAY CONSTRUCTION PROJECTS OVER THE NEXT 20 YEARS (BILLIONS)

Total Estimated 20-Year Highway Revenues	$71.7
Debt Service	-3.4
Maintenance	-38.7
Administration and Other Activities	-18.9
Total Available for Highway Construction Over 20 Years	**$10.7**

Highway Projects in the Six-Year Program	$5.3
Cost to Complete Existing Highway Projects	8.2
Total Needed to Complete Six-Year Program	**$13.5**

Estimated Shortfall	**$2.8**

The situation is similarly bleak for ports, transit, rail, and aviation. Significant dredging and expansion projects are necessary at the Port of Virginia in order to maintain market share and ensure that the port continues to be an economic engine for the Hampton Roads area and the entire state. Unmet port needs total $363 million over the 20-year period. Without increased transit funding from the state, localities, or the farebox, transit systems will struggle to maintain the condition of the fleet and transit market share will decline – presenting mobility challenges for many Virginians and further exacerbating highway congestion problems. Lack of funds to support rail means that high-speed rail in Virginia may never become a reality and the movement of freight by rail will face increased challenges. Unmet rail and public transportation needs range between $8.0 and $30.7 billion. Unmet aviation needs ($3.1 billion) will mean that many aviation improvement projects will not be completed.

Transportation Issues

Congestion

It is no surprise that survey respondents identified congestion as a top concern. In Virginia's large urban areas, motorists experienced almost 157 million hours of travel delay and wasted 254 million gallons of gasoline ($434 million) idling in traffic in 2002. But congestion is not confined to the state's large urban areas, nor to the state's highway network. Increased demand, as well as security concerns, make congestion an issue for airline travelers, rail passengers, and freight movers alike. Transportation demand is expected to continue to grow throughout the state. By 2025, two million more people will live in Virginia, mostly in areas that are already heavily populated. Virginia's economy is expected to support 2 million more jobs by 2025; most of this growth is likely to occur in localities located in and near the state's most populous areas. Over the past 20 years, 53 percent more vehicles were registered, the number of licensed drivers increased 34 percent, vehicle travel increased by 79 percent, and transit ridership rose 58 percent. However, investment in transportation facilities and services did not keep pace with this increased demand. As a result, Virginians are spending more and more time in congested conditions.

The Texas Transportation Institute ranked the Washington D.C. area as the third most congested urbanized area over 3 million in population (in terms of annual delay per traveler). Yet, 46 percent more travel will occur in the region by 2025. The number of truck trips in the region is expected to increase 33 percent, and all vehicle trips by 38 percent. The level of congestion will only get worse. The outlook is similar in other parts of the state. The Hampton Roads Planning District Commission (HRPDC) estimates that if improvements are not realized, the average speed a person can expect to travel during peak hours will be reduced by almost one half. In Richmond, annual hours of delay quadrupled in the last decade.

Congestion does not only affect highways. The Virginia Railway Express (VRE) is the second fastest growing commuter rail system in the nation, with ridership increases averaging between 15 percent and 20 percent over the previous year. But, freight movements on the corridors and storage restrictions limit VRE's ability to expand. Approximately 42 percent of Washington D.C. area Metrobus riders have difficulty obtaining a seat every day and a doubling of transit ridership is forecasted by 2025. Commercial enplanements and freight movements are expected to more than double over the next 20 years.

Strategies to address congestion include: increasing system capacity (e.g., expanding roads, adding more transit); operating the system more efficiently (e.g., signal system synchronization); and, reducing system demand (e.g., vanpools and teleworking).

Land Use

Coordinating transportation and land use is an important issue in transportation planning, and one that is extremely complex. In Virginia, responsibility for transportation typically rests with the state, while localities determine land use. This gives rise to a number of problems – traffic generated by development may exceed the transportation system's capacity; land development patterns and building site designs may not accommodate alternate travel modes; and, transportation investment decisions may accelerate development in an area that might not otherwise have developed in the same way or at the same pace. This is a fundamental problem and until the governance structure is addressed, no transportation plan can completely address the issue. Land use and quality of life issues ranked high among survey respondents and public comments received on the draft plan also reflect this sentiment with some respondents expressing concern over the consequences of suburban sprawl.

Strategies identified to more closely coordinate transportation and land use planning include: encouraging the evaluation of transportation impacts associated with various land use scenarios, both through pilot programs and coordinated efforts with localities; and, providing incentives that encourage the protection of transportation investments from the negative impacts of incompatible land uses.

Rural Transportation Issues

Almost one-third of Virginians live in rural areas which are characterized by greater geographic dispersion and fewer alternatives to the automobile. Some 70 percent of the state-maintained roads are in rural areas and the presence of many curves, hills, and narrow lanes contribute to the disproportionate number of traffic fatalities that occur in these areas. Rural residents responding to the telephone survey expressed a desire for more road improvements to increase safety and support economic competitiveness.

Strategies aimed at improving rural transportation include: expanding travel choices; addressing safety issues; and, encouraging local governments to provide enough detail in the transportation element of their local comprehensive plan to support identification of transportation priorities at the state level.

Economic Development

Virginia has a vibrant and diverse economy. While it is clear that transportation improvement in general leads to economic growth, other components, such as workforce development and technology investment must be part of the overall initiative. Transportation is key to connecting people to jobs, education, and services, as well as connecting regions of the state to economic markets.

Strategies identified to support Virginia's economy include: giving special attention to the congestion and mobility problems of the state's major metropolitan areas; collaborating with the Economic Development Partnership on statewide initiatives; expanding transportation access to support economic opportunities in rural areas; and, encouraging the development of distribution centers and inland ports with appropriate transportation access.

Asset Management

Virginia has the third-largest state-maintained highway system in the nation, but this system is aging and requires increased maintenance. About one-third of the state's interstates, primary, and secondary lane miles are classified as deficient. Most of the state's bridges are more than 25 years old and thousands are structurally deficient and/or functionally obsolete. One in five transit buses and all VRE locomotives are past the federally recommended replacement age. There are numerous "choke points" along Virginia's rail lines that challenge the ability of the state's rail system to handle anticipated increases in freight movements and higher speed trains. Unless there is significant modernization and expansion, the Port of Virginia will reach full operating capacity by 2010.

Strategies to address asset management include: continuation of a maintenance first policy; increasing the use of new materials, technologies, and strategies that reduce long-term maintenance costs; supporting development of needs-based asset management systems for all modes; and, reducing disruption due to maintenance.

Safety

There is no more basic concern of transportation agencies than the traveling safety of the public. The *VTrans2025* survey findings support this philosophy in that safety was a top concern and respondents were not willing to sacrifice it for any other goal. Planning must address safety problems that are specific to particular subgroups: seniors and teens have the highest crash rates of any age group and many roadways and intersections do not address pedestrian and bicycle needs, making it difficult for bicyclists, pedestrians, and motorists to travel safely together. The majority of crashes are due to traffic law violations, making education and enforcement critical to addressing safety concerns.

Strategies identified to address transportation safety include: identifying and addressing critical safety issues and corridors; and, increasing education and enforcement.

Security

The events of September 11, 2001 brought security to the forefront in transportation planning efforts. The security of critical transportation facilities – including the Port of Virginia, which serves as a gateway to the international community, and highway, rail, and aviation infrastructure, which serve as critical routes in the event of emergencies or other disasters – is essential.

Strategies identified to address transportation security issues include: continuing to build effective partnerships with the Department of Emergency Management and other state and federal agencies, as well as military, public, private, and other emergency responders; and, providing security at critical transportation facilities.

Freight

Located along major north/south cargo routes via Interstates 81 and 95 and home to one of the largest and most successful ports on the East Cost, Virginia receives a tremendous economic benefit from the movement of freight. However, reduced capacity can result from mixing cars and large trucks on highways, and increased rail freight shipments present conflicts with passenger rail service. Freight movements in Virginia are expected to increase dramatically over the next 20 years – by about 80 percent for trucks, 40 percent for rail, 300 percent for air, and 100 percent through the port – further taxing the capacity of the state's freight terminals and transportation infrastructure.

Strategies identified to address freight movement in Virginia include: increasing investment in the state's freight infrastructure; facilitating coordination between private and public interests on freight issues; considering establishment of a Freight Council; and, establishing a Freight Office to increase attention to freight issues.

Intermodal Connectivity

Transportation planning in Virginia has traditionally been directed toward identifying the needs of individual modes. All too often there are both physical and institutional barriers to intermodal connections in the state. Physical barriers include poor access to general aviation airports, lack of adequate park-and-ride facilities adjacent to high occupancy vehicle (HOV) lanes, insufficient clearance for double-stacked trains, and lack of bicycle and pedestrian facilities at transit stations. Institutional barriers include policies that discourage intermodal projects.

Strategies aimed at addressing intermodal connectivity include: encouraging development of infrastructure that facilitate seamless connectivity; and, evaluation of transportation alternatives and alternative mode accommodations in the early stages of planning.

Accessibility and Mobility for Special Needs Populations

Of particular concern are issues of transportation accessibility for special needs populations, such as the elderly, lower socioeconomic groups, and the disabled. Accessibility to transportation resources ensures access to jobs, childcare, health care, shopping, and other goods and services. Access to reliable transportation alternatives to the automobile, such as transit, can mean achieving full participation in community life for individuals who are unable to drive due to physical or cognitive impairments, or who lack access to an automobile.

Strategies directed at addressing accessibility and mobility for special needs populations include: increasing transportation choices for special needs populations and considering their needs in the planning, design, and construction of transportation facilities and services.

Natural and Human Environment

The Commonwealth has tremendous natural, cultural, and historic resources, as well as strong and vibrant communities. Results of the *VTrans2025* survey indicate that continued protection of these resources and the quality of life for Virginians remains a top priority. Air quality is a key issue to the health and well being of Virginians but several areas of the state do not meet federal air quality standards. The protection of the Chesapeake Bay watershed, which stretches into western portions of the state, is also critical to the welfare of citizens. As transportation accounts for approximately 31 percent of the energy used in Virginia (64 percent of which is used as gasoline), energy consumption, specifically alternatives to the automobile, is an important consideration. Participants in the planning process expressed a strong desire for transportation facilities and services that are compatible with their communities and desired quality of life.

Strategies targeted at addressing the natural and human environment include: increasing collaboration with environmental resource agencies; seeking out opportunities to exceed environmental requirements; linking planning and environmental processes; balancing state and local needs; and, considering community impacts of transportation facilities.

Technology

Increasingly, technology is being employed to address transportation congestion, systems operations, and safety issues. Virginia continues to be a leader in researching and deploying the latest technologies. Just as newer and more complex technologies will continue to drive the development of products and services, they will also contribute to the development of the transportation system.

Strategies aimed at addressing technology include: bundling technological improvements with capacity improvements; proactively considering technological improvements to address transportation issues; and, supporting and investing in technologies and innovation.

A Blueprint for Shaping the Transportation Future

VTrans2025 is about making connections between transportation modes, geographic entities, transportation agencies, and planning partners. Transportation planning must increasingly focus on multimodal solutions to moving people and goods throughout the state. Identification of Multimodal Investment Networks (MINs) promotes consideration of the transportation system as an interconnected network. Identifying projects where one mode relies on another, intersects with another, or might substitute for another and giving them increased consideration in the modal plans results in more multimodal solutions. Several illustrative MINs are shown in Appendix D.

The *VTrans2025* vision and goals serve as the basis for objective, performance-based criteria used to determine multimodal priorities. Each transportation mode develops its own objective criteria reflecting the common vision and goals of *VTrans2025*. In this way, *VTrans2025* ensures that transportation planning and decision-making at the state and agency levels reflect the needs and desires of Virginians. It also increases accountability, informs decision-making, and facilitates the spending of limited funds on projects that will achieve the greatest system benefit.

The following recommendations call for new policy direction in four key areas – funding and investment, land use, connectivity, and priority setting – and address how to sustain the *VTrans2025* vision.

Funding/Investment

- **Invest More in Transportation.** Substantially raise state investment in transportation in order to maintain the existing system in good, safe condition and expand capacity to meet growing needs. Continuing to under-invest in transportation will result in worsening congestion, increased travel unreliability, and diminished economic prosperity. User fees and taxes must be increased, new sources of funding, such as indexing fuel taxes to inflation, and greater use of tolling and General Funds must be considered in order to address investment needs and increase system capacity.

- **Support Transit.** As new revenues become available, state support for public transit should be increased to expand service and provide increased mobility and travel choices.

- **Remove Bias.** The state should not bias the local choice of transit versus roadways by the way in which it funds the modes. Leveling the playing field between the modes should occur by increasing the state's funding of transit. Additionally, increased use of the existing flexibility for transferring highway funds to transit should be encouraged.

- **Fund Rail.** Identify options for a sustainable source of state funding with which to support freight rail capital improvements and capital and operating costs of passenger rail. Additionally, work with the railroad companies to ensure that upgrades are made to track and other equipment that benefit both passenger and freight rail; strongly advocate that the federal government take responsibility for making the necessary investments in

rail in Virginia, and the major corridors of which it is a part; and, give consideration to creating a Rail Authority or the greater use of the Rail Preservation and Development Fund.

- **Protect Transportation Trust Fund Revenues.** An appropriate mechanism, including the consideration of a constitutional amendment, should be found to require all funds in the Transportation Trust Fund and Highway Maintenance and Operating Fund to be expended on transportation projects and services and to prevent their being appropriated for non-transportation purposes.

Land Use

- **Strengthen Planning Including Modeling Land Use Impacts.** Strengthen local and regional planning and enhance the role of the state as a reliable and active partner in those planning efforts. Expand state capabilities and the use of pilot programs to identify and model impacts of different types of development on transportation and vice versa.

- **Manage Access.** Implement access management policies that ensure greater compatibility of land use and transportation priorities.

- **Consider State Versus Local Roles.** To better align land use and transportation decision-making, seriously consider restructuring the system for managing local roads in order to give more authority to local governments and make the system uniform for cities, towns, and counties. Any new administrative burdens that this might place on rural jurisdictions must be carefully weighed.

- **Address the Transportation/Land Use Conflict.** The General Assembly should address the conflict that arises from the separation of authority for transportation and land use.

Connectivity

- **Improve Connections.** Projects that connect travel modes will receive increased consideration in modal plans and funding decisions.

- **Think Multimodally.** Transit, pedestrian, bike and rail-friendly design features will be incorporated, as appropriate, whenever there is a major reconstruction or new construction.

- **Take the Lead.** Virginia must take a leadership role in working with other states to ensure connectivity of interstate corridors, such as the Heartland Corridor and Interstate 81.

- **Invest in Technology.** Significantly increase investment in advanced technologies and demand management strategies that maximize the efficiency of the existing transportation system and improve travel by managing the system better.

Priority Setting

- **Use Objective Criteria.** Establish objective criteria for all modes in order to measure and compare the merits of proposed projects and to make more informed investment decisions.

- **Plan Multimodally.** Continue development of the Multimodal Investment Network (MIN) approach as a framework for planning and prioritizing multimodal projects at the state level, giving particular attention to how this new approach to planning can assist in allocating scarce transportation dollars.

Sustaining the Vision of *VTrans2025*

- **Continue Public and Stakeholder Involvement.** Continue to provide increased opportunities for public and stakeholder involvement and ensure transparency in transportation decision-making.

- **Continue Transportation Agency Head Coordination.** Each of the directors of the Department of Rail and Public Transportation, the Department of Aviation, and the Virginia Port Authority, and the Commissioner of the Department of Transportation must take responsibility for continuing the statewide multimodal planning effort and dedicate staff and resources to accomplish it.

- **Review Intermodal Office Alignment.** Review organizational alignment, staffing, and funding levels for the Intermodal Office and make recommendations to enhance the effectiveness and further institutionalize intermodal and freight planning in the Commonwealth.

- **Develop Action Plan.** Develop an administrative action plan to implement *VTrans2025* objectives and recommendations.

- **Continue Technical Committee.** Continue the *VTrans2025* Technical Committee to provide staff coordination.

- **Establish a Commission.** Establish a Commission to make specific recommendations on how to meet the Commonwealth's long-term transportation funding needs and address other legislative issues identified in the *VTrans2025* final report.

CHAPTER 1. POLICY RECOMMENDATIONS

*V*irginia is a growing, dynamic state and the transportation system must meet the growing and changing needs of travelers and businesses in the Commonwealth. The *VTrans2025* Policy Committee focused on four policy areas: funding/investment; land use; connectivity; and, priority setting, including the development of objective criteria. The committee also made recommendations on how to sustain the vision of *VTrans2025*. Other on-going and new initiatives were addressed in the body of this report, including steps to improve safety, advance high environmental standards, use state-of-the-art technology, and improve asset management.

Funding/Investment

Funding Levels

Substantially raise state investment in transportation in order to maintain the existing system in good, safe condition and expand capacity to meet growing needs. Continuing to under-invest in transportation will result in worsening congestion, increased travel unreliability, and diminished economic prosperity. User fees and taxes must be increased, new sources of funding, such as indexing fuel taxes to inflation, and greater use of tolling and General Funds must be considered in order to address investment needs and increase system capacity.

The maintenance, operation, and capital needs of all transportation modes in Virginia will approach $203 billion over the 2005-2025 time period, while the best estimate of revenue available will total $95 billion for the same period. Whether and how to close this gap is a fundamental public policy choice that will determine if effective transportation results can be achieved in the 21st century. Either the expectations of Virginians must be lowered or the financing of the system raised. Doing nothing will only continue the ongoing trend of disinvestment in the entire system. This recommendation recognizes that additional resources and new sources of revenues are needed to accomplish this and realize Virginia's vision of a safe, strategic, and seamless transportation system.

Investing in Transit

As new revenues become available, state support for public transit should be increased to expand service and provide increased mobility and travel choices.

The state should not bias the local choice of transit versus roadways by the way in which it funds the modes. Leveling the playing field between the modes should occur by increasing the state's funding of transit. Additionally, increased use of the existing flexibility for transferring highway funds to transit should be encouraged.

Additional transit funding is needed even to maintain existing assets and service coverage. Yet, Virginians have indicated they want more choices, more alternatives. Highway congestion is reaching uncomfortable levels in many places in the Commonwealth and providing increased transit, ridesharing, and demand management will improve the operation of the transportation system.

Currently, a disparity exists in funding responsibilities between transit and highways. A local jurisdiction that is planning transportation improvements may assume that the federal and state governments will pay all or nearly all of the costs of highway projects. For projects on the state-maintained system (as opposed to roads that are constructed by localities), federal and state funds support between 98 and 100 percent of the costs. However, if a locality chooses a transit project, it does so anticipating a significant investment of local funds (at least 30 percent of the costs). The disparity in funding responsibilities results in a planning bias by local governments toward highway projects since transit projects require a far greater investment of local funds. While the *Code* permits transferring primary, secondary, and urban highway funds to transit projects, the current paucity of highway funds does not make this a real choice. The recommendation addresses leveling the playing field between the modes by increasing the state's funding for transit and by taking greater advantage of the federal funding flexibility that currently exists.

Supporting Rail

Identify options for a sustainable source of state funding with which to support freight rail capital improvements and capital and operating costs of passenger rail. Additionally, work with the railroad companies to ensure that upgrades are made to track and other equipment that benefit both passenger and freight rail; strongly advocate that the federal government take responsibility for making the necessary investments in rail in Virginia, and the major corridors of which it is a part; and, give consideration to creating a Rail Authority or the greater use of the Rail Preservation and Development Fund.

Currently, there is no state funding program for rail equivalent to the existing Highway Capital Improvement Fund, Mass Transit Fund, Airport Fund, and Port Fund. Freight is expected to double over the next two decades and most freight corridors are already experiencing heavy traffic. This has implications for passenger rail, as well, since they share the same rights of way. Acting alone, neither the private nor public sectors have sufficient capital to make the necessary rail improvements. This recommendation promotes developing a partnership with the private sector and using state funds to leverage private sector investment. Further, the federal government must become a partner in guaranteeing the vitality of freight and passenger rail.

Protecting Revenues

An appropriate mechanism, including the consideration of a constitutional amendment, should be found to require all funds in the Transportation Trust Fund and Highway Maintenance and Operating Fund to be expended on transportation projects and services and to prevent their being appropriated for non-transportation purposes.

In the past, transportation revenues have been diverted to the General Fund to support non-transportation functions during times of fiscal crisis. The *VTrans2025* telephone survey found that Virginians are willing to pay more for transportation facilities and services if they are certain the funds will be used for transportation improvements. Protection of transportation revenues will be necessary to ensure that full accountability and enduring trust is the hallmark of transportation planning and investment decisions throughout the Commonwealth. This recommendation calls for protection of transportation revenues by some mechanism; however, the implications of any constitutional amendment (on the state's bond rating, for example) must be carefully considered.

Land Use

Coordinating Transportation and Land Use Decisions

Strengthen local and regional planning and enhance the role of the state as a reliable and active partner in those planning efforts. Expand state capabilities and the use of pilot programs to identify and model impacts of different types of development on transportation and vice versa.

Implement access management policies that ensure greater compatibility of land use and transportation priorities.

In Virginia, the state is responsible for transportation and local governments are responsible for land use and zoning. Frequently there are inadequate incentives for municipalities to cooperate with one another and the state on transportation and land use issues. These recommendations recognize the need to take voluntary but cumulative steps toward improving transportation and land use planning in the state. Further, the recommendations recognize the need to support efforts currently underway, such as pilot projects and modeling exercises, and encourage additional initiatives that explore the relationship between transportation and land use, enhance modeling capabilities, and implement access management.

Local Versus State Responsibilities

To better align land use and transportation decision-making, seriously consider restructuring the system for managing local roads in order to give more authority to local governments and make the system uniform for cities, towns, and counties. Any new administrative burdens that this might place on rural jurisdictions must be carefully weighed.

The General Assembly should address the conflict that arises from the separation of authority for transportation and land use.

Currently, VDOT maintains all county roads (except for Henrico and Arlington) and provides payments to cities and towns over 3,500 for maintenance of their local roads. The First Cities Initiative allows cities to take responsibility for the construction program as well. Consideration should be given to more closely aligning transportation and land use planning by concentrating greater decision-making authority in the same level of government, with the state playing a coordinating role. A uniform method of managing local roads in cities, towns, and counties should be considered. The separation of responsibilities contributes to decisions that result in incompatible transportation infrastructure and land development patterns. No transportation plan can completely resolve the fundamental problem posed by the separation of responsibilities for transportation and land use.

Connectivity

Projects that connect travel modes will receive increased consideration in modal plans and funding decisions.

Transit, pedestrian, bike and rail-friendly design features will be incorporated, as appropriate, whenever there is a major reconstruction or new construction.

Virginia must take a leadership role in working with other states to ensure connectivity of interstate corridors, such as the Heartland Corridor and Interstate 81.

Significantly increase investment in advanced technologies and demand management strategies that maximize the efficiency of the existing transportation system and improve travel by managing the system better.

Providing choices and improving the ease of connections among modes offer opportunities for significant improvements in transportation productivity. These recommendations recognize the need to make connections between the modes easier and more efficient in Virginia and other states.

Priority Setting

Setting Priorities

Establish objective criteria for all modes in order to measure and compare the merits of proposed projects and to make more informed investment decisions.

Use of objective criteria for establishing priorities increases accountability and relates transportation investments to system performance. It also makes the process more transparent and more easily communicated to the public. Use of objective criteria to establish priorities informs decision-makers and facilitates spending funds on projects that will achieve the greatest system benefit.

Decision-Making Framework

Continue development of the Multimodal Investment Network (MIN) approach as a framework for planning and prioritizing multimodal projects at the state level, giving particular attention to how this new approach to planning can assist in allocating scarce transportation dollars.

The MIN approach to planning involves considering MINs both as a *concept* – improving multimodal linkages, and as a *process* – describing how the state identifies multimodal solutions and works with its planning partners to craft and implement MINs. While this new approach promises to provide a useful framework for multimodal transportation planning, further development is necessary. The state must continue to work with its local, regional, and agency planning partners to refine and test both the concept and the process.

Sustaining the Vision of *VTrans2025*

Continue to provide increased opportunities for public and stakeholder involvement and ensure transparency in transportation decision-making.

Each of the directors of the Department of Rail and Public Transportation, the Department of Aviation, and the Virginia Port Authority, and the Commissioner of the Department of Transportation must take responsibility for continuing the statewide multimodal planning effort and dedicate staff and resources to accomplish it.

Review organizational alignment, staffing, and funding levels for the Intermodal Office and make recommendations to enhance the effectiveness and further institutionalize intermodal and freight planning in the Commonwealth.

Develop an administrative action plan to implement *VTrans2025* objectives and recommendations.

Continue the *VTrans2025* Technical Committee to provide staff coordination.

Improving multimodal transportation planning in Virginia will require a sustained commitment. Continuing the *VTrans2025* Technical Committee will facilitate multimodal coordination and communication among the transportation modes. Developing an action plan to implement the specific recommendations identified in *VTrans2025* will ensure that the progress made during its development is not lost. Further, reviewing the Intermodal Office to ensure that it is appropriately organized, staffed, and funded will ensure establishment of an effective champion at the Secretariat level to promote intermodal planning.

Establish a Commission to make specific recommendations on how to meet the Commonwealth's long-term transportation funding needs and address other legislative issues identified in the *VTrans2025* final report.

As discussed in Chapter 9, there are many different options for raising transportation funds. The implications of each alternative should be fully evaluated to determine the most appropriate course of action for the Commonwealth. Other issues identified in this report may require legislative action and should be carefully considered.

CHAPTER 2. THE ROLE OF *VTRANS2025* IN TRANSPORTATION PLANNING IN VIRGINIA

Virginia's transportation system has been influenced by many factors—originally the need for farmers to transport tobacco from the mainland to wharves, then for pioneers to travel west, and later for access to commercial centers. Today, Virginia's transportation system provides a vital link to jobs, schools, recreation, health facilities, and other essential daily destinations. Transportation touches nearly every facet of our lives—from the freshness and cost of the produce delivered to our local grocers to the way we travel to and from work; from the ease with which we can visit family, friends, and tourist attractions, to the character of the very communities in which we live. While the transportation system provides personal access and mobility for many Virginians, it also plays a role in opening up rural lands for development and moving people and centers of commerce out of older cities. Continued innovation and foresight will be necessary to protect the state's investment in transportation infrastructure and to ensure safe and efficient travel in the future. It is also critical that state and regional transportation planning and investments be integrated with local land use planning and decisions in a way that promotes the optimum economic, social, and environmental health for all of the Commonwealth's communities.

Virginia has embarked on a formal planning effort, called *VTrans2025*, that starts with a vision of where Virginia would like to be in 2025 and identifies the policies and processes necessary to achieve it. *VTrans2025* will facilitate a more integrated, convenient, and efficient transportation system for all of the Commonwealth's travelers. It is a blueprint for connecting highways, transit facilities, passenger and freight rail, air and water ports, and bicycle and pedestrian trails to form a safe, strategic, and seamless transportation system.

Legislative Requirements and Previous Statewide Planning Efforts

Federal law requires states to carry out a continuing, comprehensive, and coordinated transportation planning process, including the development of a statewide long-range transportation plan. Seven planning factors are identified for consideration, including (1) economic vitality, (2) safety and security, (3) accessibility and mobility for people and freight, (4) quality of life and environmental protection, (5) integration and connectivity, (6) system management, and (7) system preservation (see Section 1204(e) PL 105-178).

The 1995 *Statewide Intermodal Long-Range Transportation Policy Plan* established policy goals to guide Virginia's efforts to develop an efficient, seamless intermodal transportation system for the future. *VTrans2025* is the next step in planning for seamless connectivity in Virginia. At the direction of Governor Mark R. Warner and spearheaded by Secretary of Transportation Whittington W. Clement, the state's top-level transportation policy leaders engaged in a formal planning effort to analyze the future trends and needs of highway motorists, rail and transit passengers, freight shippers, air travelers, cyclists, and pedestrians.

Recent Successes in Transportation

Since taking office in January 2002, Governor Warner has confronted significant financial challenges that threatened the Commonwealth's ability to provide core services and preserve its AAA bond rating. The General Assembly responded this past spring by increasing revenues to the General Fund, but no additional transportation funding was provided. In addressing Virginia's unmet transportation needs, the Warner administration adopted a businesslike approach – sound policies that are prudent irrespective of the available resources.

Reforming VDOT

Among the Governor's top priorities was restoring accountability and instituting sound business practices at VDOT. To promote greater accountability, the Six-Year Construction Program, for the first time, is managed and accessible to the public online, making the business of transportation more transparent to taxpayers. VDOT's organizational structure has been streamlined through a reduction in a layer of management and the movement of more decision-making authority to the district level. Additionally, VDOT now prepares a detailed financial plan for all projects in excess of $100 million.

The CTB adopted its first-ever debt management policy and implemented a uniform cost estimating system. For the first time, the CTB adopted policy goals, including promotion of safety and maintenance, in preparation of the Six-Year Construction Program.

Ensure Safer Highways

The Governor sponsored a series of transportation safety initiatives that were enacted into law in 2003. These included: transportation safety corridors with enhanced penalties, enhanced penalties for speeding , increased penalties for driving under the influence, automatic revocation of driver's licenses for underage drinking and driving, and statewide use of laser detection for law enforcement.

The Governor also created the Task Force to Combat Driving Under the Influence of Drugs and Alcohol. The task force recommended 33 legislative, court-related, and administrative actions, many of which are in effect today.

Building a Secure Virginia

To secure Virginia from potential threats, several initiatives were implemented. One was the creation of the Office of Commonwealth Preparedness. This office is charged with developing a seamless, coordinated security and preparedness strategy for Virginia.

Specific transportation-security related initiatives were also undertaken. A security and emergency management unit was established at VDOT, and $25 million was set aside to provide security enhancements to VDOT's critical infrastructure and key assets. VPA implemented a radiation detection system that scans import containers for the presence of radioactive material – a critical threat facing American ports. DOAV established the General Aviation Voluntary

Security Certification Program to encourage the state's 58 general aviation airport sponsors to develop airport security plans, reducing the risk of aviation assets being used as instruments of terror.

Promote Multimodal Planning

Since taking office, Governor Warner has insisted on long-range, multimodal transportation planning in order to ensure that Virginia's ports, airports, highways, passenger rail, and public transit systems fully complement each other today and in the future. As part of this commitment, Governor Warner and Secretary Clement appointed a new Deputy Secretary of Transportation with responsibility for intermodal planning. In addition, the first statewide transit plan was developed, as well as the first rail plan.

Governor Warner and Secretary Clement directed VDOT to implement a bicycle and pedestrian policy that requires VDOT to consider accommodating bicyclists and pedestrians in its approach to all projects. And, the first bicycle and pedestrian plan was developed.

Expanding Local Control and Flexibility

On July 1, 2004, based on legislation passed in 2003, Richmond, Hampton and Virginia Beach became the first cities to take over management of their local road construction programs from VDOT. VDOT traditionally has managed all aspects of road projects for cities and towns across the state with few exceptions.

Cities and towns now have the option of using some or all of their urban construction funds for transit or for enhanced street maintenance. Counties now have the option of using some or all of their secondary road funds for transit or for surfacing "Rural Rustic Roads."

The Role of *VTrans2025* in Transportation Planning in Virginia

As envisioned in both federal and state legislation, transportation planning in Virginia is largely a bottom-up process. For transportation planning at the regional level, discussion takes place among the state transportation agencies and transportation providers and their regional and local planning partners. Local and regional transportation plans address issues such as economic development, environmental quality, congestion mitigation, and land use, with a specific focus on issues and priorities within the boundaries of the region. The planning process leads to identification of needed transportation facilities and services, which are compiled into capital programs that identify specific projects and the resources and time frames for their implementation.

The importance of *VTrans2025* lies in its role in shaping Virginia's transportation future by linking transportation planning at the agency level to a broad vision and specific objectives covering the entire state. *VTrans2025* provides a forum for making decisions about statewide transportation policy that accounts for the multimodal needs and expectations of transportation users and communities across the Commonwealth. It also provides a framework for focusing

resources on strategic investments that make incremental progress toward achieving a true multimodal system. *VTrans2025* establishes a performance-based planning process that gives priority to multimodal solutions and fosters better communication between the state and its local and regional transportation partners.

VTrans2025 was developed in three phases. Phase 1 began in 2001 with stakeholder discussion group meetings across the state and the development of long-range goals and objectives. These efforts established the foundation upon which the rest of the plan was built. *House Document No. 10*, 2003, is a complete report on the Phase 1 deliverables. In Phase 2, formation of the vision component of the plan began, with numerous stakeholder outreach meetings and evaluation of various transportation-related policies. An inventory and assessment of the existing transportation system was completed. *House Document No. 38*, 2004, documents the Phase 2 deliverables. During Phase 3, multimodal transportation needs were identified and this final plan was produced. This Phase 3 final report summarizes the entire effort and serves as both a vision plan that establishes broad multimodal transportation policy goals, objectives, and strategies and a multimodal transportation needs assessment that identifies large-scale systems of multimodal projects.

Regional Planning Partners

Metropolitan Area Planning

There are fourteen urbanized areas in Virginia identified by the U.S. Bureau of the Census. Federal law mandates that these areas have a cooperative, comprehensive, and continuing transportation planning process. A policy board, referred to as a Metropolitan Planning Organization (MPO), is required to be established in these areas, shown in Figure 3. The membership of the MPO is comprised of representatives from each of the local jurisdictions within the area, transit operators, and VDOT. There are also non-voting members on the MPO who represent the FHWA, the FTA, and other state agencies involved in transportation. Of the fourteen MPOs in Virginia, three have a population of over 200,000 – Richmond, Hampton Roads, and Northern Virginia. These areas have water ports and international airports that generate additional pressures on the movement of people and freight through the area.

The responsibility of the MPO is to encourage and promote the safe and efficient management, operation, and development of surface transportation systems that will serve the mobility needs of people and freight and foster economic growth and development within and through urbanized areas, while minimizing transportation-related fuel consumption and air pollution.

To accomplish this objective the MPOs, in cooperation with the state and public transit operators, must develop long-range transportation plans with a 20-year horizon. The long-range transportation plan must identify transportation facilities that should function as an integrated metropolitan transportation system. Emphasis should be given to those facilities that serve important national and regional transportation functions. MPOs must financially constrain their plans based on anticipated revenue over the life of the plan. Due to revenue limitations, all

transportation needs for an area are not contained in the adopted constrained plans. Statewide long-range transportation plans that are not financially constrained are typically referred to as "vision" plans. Generally, a project cannot be funded unless it is part of an MPO plan. The MPO is the basic building block of planning in urbanized Virginia.

Non-Metropolitan Area Planning

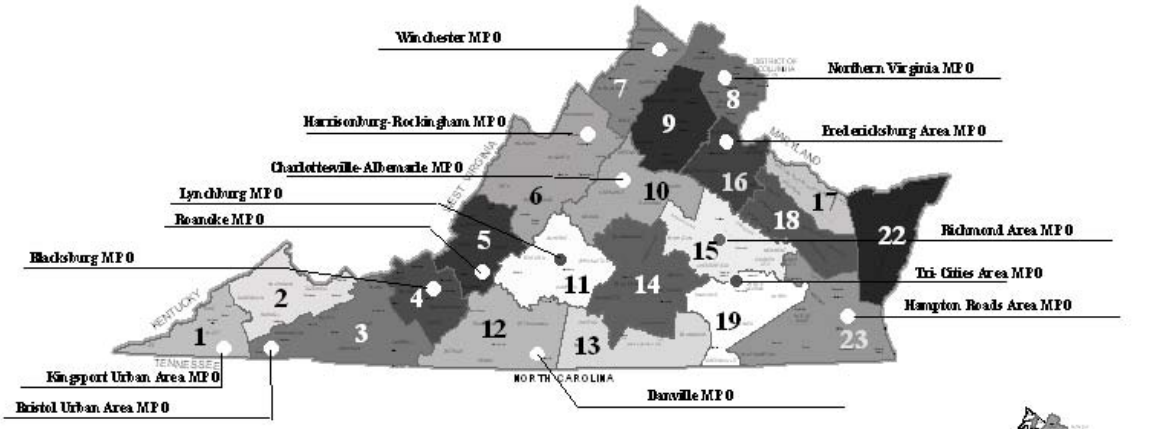
Transportation planning outside of the metropolitan areas is the responsibility of the state. In an effort to establish a regional approach to planning in non-metropolitan areas, VDOT created the Rural Transportation Planning Program to provide financial assistance to Virginia's PDCs. PDCs are regional planning bodies that are involved in other planning disciplines such as community development, in addition to transportation planning. Funding is provided to 20 of Virginia's 21 PDCs; the Northern Virginia PDC does not receive planning funds because there is no rural area within the PDC and they do not staff the region's MPO. The purpose of the Rural Transportation Planning Program is to provide transportation planning assistance to these areas and to more adequately involve citizens in the planning effort.

Over the past several years VDOT, in cooperation with localities and applicable PDCs, developed long-range transportation plans for 44 small urban areas of the state (i.e., areas with a population between 3,500 and 50,000). These small urban area studies are financially unconstrained and address all modes of transportation.

Participation in the *VTrans2025* Planning Effort

The transportation planning efforts of the MPOs and the PDCs were reviewed and given consideration during the development of *VTrans2025*. In addition, input from these important transportation-planning partners was actively sought throughout the plan's development, and particularly with respect to the plan's vision, goals, and objectives, and objective prioritization process. PDCs co-hosted public and stakeholder meetings for *VTrans2025* and were represented on the *VTrans2025* Technical Committee.

FIGURE 3. VIRGINIA'S REGIONAL TRANSPORTATION PLANNING PARTNERS



Planning Districts

1. LENOWISCO
Lee County
Scott County
Wise County
Norton City

2. CUMBERLAND PLATEAU
Buchanan County
Dickenson County
Russell County
Tazewell County

3. MOUNT ROGERS
Bland County
Carroll County
Grayson County
Smyth County
Washington County
Wythe County
Bristol City
Galax City

4. NEW RIVER VALLEY
Floyd County
Giles County
Montgomery County
Pulaski County
Radford City

5. ROANOKE VALLEY-ALLEGHANY
Alleghany County
Botetourt County
Craig County
Roanoke County
Clifton Forge City
Covington City
Roanoke City
Salem City

6. CENTRAL SHENANDOAH
Augusta County
Bath County
Highland County
Rockbridge County
Rockingham County
Buena Vista City
Harrisonburg City
Lexington City
Staunton City
Waynesboro City

7. NORTHERN SHENANDOAH VALLEY
Clarke County
Frederick County
Page County
Shenandoah County
Warren County
Winchester City

8. NORTHERN VIRGINIA REGIONAL COMMISSION
Arlington County
Fairfax County
Loudoun County
Prince William County
Alexandria City
Fairfax City
Falls Church City
Manassas City
Manassas Park City

9. RAPPAHANNOCK-RAPIDAN
Culpeper County
Fauquier County
Madison County
Orange County
Rappahannock County

10. THOMAS JEFFERSON
Albemarle County
Fluvanna County
Greene County
Louisa County
Nelson County
Charlottesville City

11. REGION 2000
Amherst County
Appomattox County
Bedford County
Bedford City
Campbell County
Lynchburg City

12. WEST PIEDMONT
Franklin County
Henry County
Patrick County
Pittsylvania County
Martinsville City

13. SOUTHSIDE
Brunswick County
Halifax County
Mecklenburg County

14. PIEDMONT
Amelia County
Buckingham County
Charlotte County
Cumberland County
Lunenburg County
Nottoway County
Prince Edward County

15. RICHMOND REGIONAL
Charles City County
Chesterfield County
Goochland County
Hanover County
Henrico County
New Kent County
Powhatan County
Richmond City

16. RAD CO
Caroline County
King George County
Spotsylvania County
Stafford County
Fredericksburg City

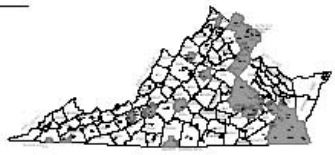
17. NORTHERN NECK
Lancaster County
Northumberland County
Richmond County
Westmoreland County

18. MIDDLE PENINSULA
Essex County
Gloucester County
King and Queen County
King William County
Mathews County
Middlesex County

19. CRATER
Dinwiddie County
Greensville County
Prince George County
Surry County
Sussex County
Colonial Heights City
Emporia City
Hopewell City
Petersburg City

22. ACCOMACK-NORTHAMPTON
Accomack County
Northampton County

23. HAMPTON ROADS
Isle of Wight County
James City County
Southampton County
York County
Chesapeake City
Franklin City
Hampton City
Newport News City
Norfolk City
Poquoson City
Portsmouth City
Suffolk City
Virginia Beach City
Williamsburg City



MPO's

Blacksburg MPO
Montgomery Co., Blacksburg, Christiansburg

Bristol Urban Area MPO
Washington Co., Bristol

Charlottesville-Albemarle MPO
Albemarle Co., Charlottesville

Danville MPO
Pittsylvania Co., Danville

Fredericksburg Area MPO
Spotsylvania Co., Fredericksburg, Stafford Co.

Hampton Roads MPO
Gloucester Co., Williamsburg, Virginia Beach, Suffolk, Chesapeake, Portsmouth, Norfolk, Newport News, Hampton, York, Smithfield, Poquoson, Isle of Wight Co., James City Co.,

Harrisonburg-Rockingham MPO
Rockingham Co., Bridgewater, Dayton, Mt. Crawford, Harrisonburg

Kingsport Urban Area MPO
Scott Co., Gate City, Weber City

Lynchburg Area MPO
Amherst Co., Campbell Co., Bedford Co., Lynchburg

Northern Virginia Portion of The Metropolitan Washington Council of Governments
Arlington Co., Fairfax Co., Loudoun Co., Prince William Co., Fairfax, Manassas, Manassas Park, Falls Church, Alexandria

Richmond Area MPO
Charles City Co., Ashland, Richmond, Powhatan Co., New Kent Co., Henrico Co., Chesterfield Co., Hanover Co., Goochland Co.,

Roanoke Valley Area MPO
Bedford Co., Botetourt Co., Vinton, Salem, Roanoke, Roanoke Co.

Tri-Cities Area MPO
Chesterfield Co., Colonial Heights, Hopewell, Petersburg, Prince George Co., Dinwiddie Co.

Winchester MPO
Frederick Co., Stephens City, Winchester

CHAPTER 3. OVERVIEW OF TRANSPORTATION IN VIRGINIA

During Virginia's first century, when settlement was confined largely to the Hampton Roads area, roads were merely an adjunct to water transportation. As settlement passed the Fall Line in the early 18th century, roads became the primary means of travel in the Piedmont and in the region west of the mountains. In the early 1800s, large-scale transportation improvement projects were usually aimed at facilitating commerce. Ground transportation improvement projects were a mixture of turnpikes and similar for-profit roadways as well as canals and railroads. Despite enjoying widespread political support, canals were superseded by railroads by the mid 19th century. Also at this time, more than 50 years before the Wright Brothers' historic flight, hot air balloons were used to "spy" on Confederate forces during the Civil War.

Virginia's Transportation System

Virginia has an extensive transportation system, as shown in Figure 4. The Port of Virginia is one of the largest and most successful ports on the East Cost, and Virginia's air transportation system is one of the most sophisticated in the country. Virginia has the third largest state-maintained highway system in the nation, providing the infrastructure for passenger and freight movement by car, truck, bus, and bicycle. There are two Class I railroads operating in Virginia.

FIGURE 4. VIRGINIA'S TRANSPORTATION SYSTEM AT A GLANCE

Highways
• More than 70,000 miles roadway
• More than 12,000 bridges, including 13 movable bridges
• Four underwater crossings in the Hampton Roads area
• Two mountain tunnels on Interstate 77 in Southwest Virginia
• 41 rest areas and 10 welcome centers along major highways
• More than 100 commuter parking lots, including over 20 bus stops and shelters
• More than 100 miles of high-occupancy vehicle (HOV) lanes
• 2,000 traffic signals
• Four Smart Traffic Centers
Transit and Rail
• 40 public transportation providers, including 35 private transit companies
• 50 human-service providers of transit
• 15 commuter assistance programs
• 12 railroad companies, including 9 short-line railroads
Airports
• 67 public-use airports, including 9 commercial airports
Ports
• Four state-operated port terminals
Ferries
• Four state-operated ferry services

While a significant portion of the state's transportation infrastructure is overseen by the four modal agencies, many transportation assets and services do not fall within their purview. Freight railroads and intercity buses are owned and operated by private companies. There are two providers of intercity bus service in Virginia. Greyhound Lines and Carolina Trailways, which is a subsidiary of Greyhound, serve 58 points in Virginia.

Local governments take the lead in providing transit services to meet local needs. Some private and municipality owned marine terminals, such as the Port of Richmond, do not fall under the purview of VPA. Private toll facilities, private transportation services such as taxis and shuttles, and private airports are not owned and operated by the state and are not included in Figure 4.

Intercity buses provide an essential link in the transportation system. In FY 2001, there were 440,000 intercity bus passengers.

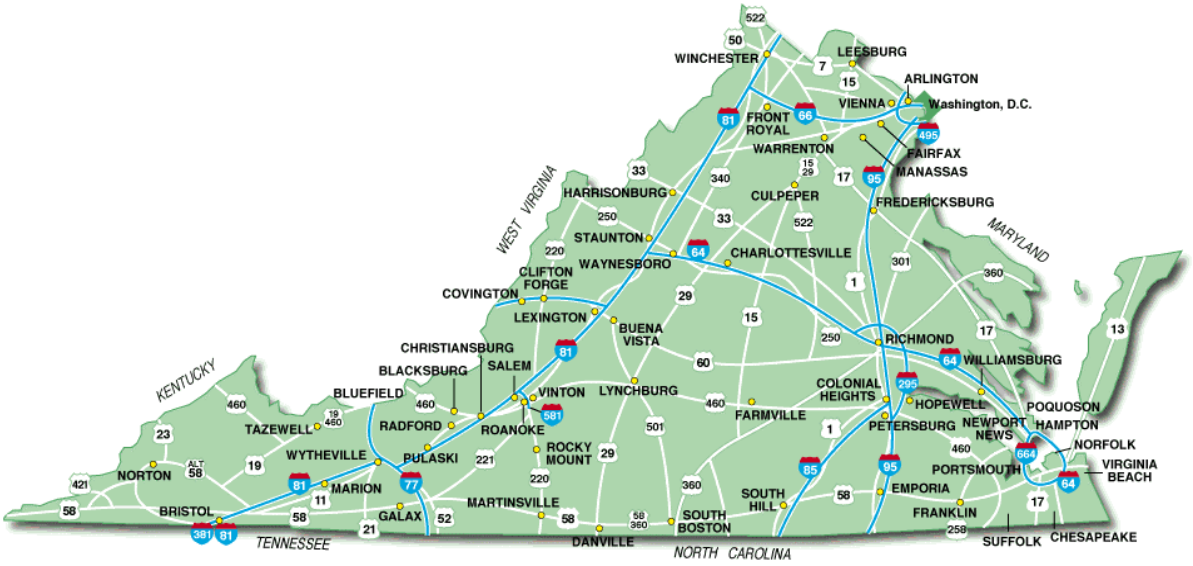
Highways

Virginia's state-maintained highway system is divided into the following categories for funding purposes:

- **Interstate** — More than 1,100 miles of four- to ten-lane highways that connect states and major cities.
- **Primary** — More than 8,000 miles of two to eight-lane roads that connect cities and towns with each other and with interstates.
- **Secondary** — More than 47,500 miles of local connector or county roads. (Arlington and Henrico counties maintain their own county roads.)
- **Urban** — Includes more than 10,000 miles of urban streets, maintained by cities and towns with the help of state funds. (Virginia's cities are independent of counties.)

Figure 5 shows the Commonwealth's interstate and primary highway systems.

FIGURE 5. INTERSTATE AND PRIMARY HIGHWAY SYSTEMS IN VIRGINIA



Transit

There are 40 public transportation systems Virginia. They are classified as urban, small urban, rural, intercity bus, and intercity rail. All of the urban public transit systems provide bus fixed route service and demand responsive services, as required by the Americans with Disabilities Act (ADA). Hampton Roads Transit also operates vanpools and a ferry service. VRE operates commuter service along tracks on two lines in Northern Virginia, connecting Manassas (Norfolk Southern tracks) and Fredericksburg (CSX tracks) with downtown Washington, D.C. Many public transit systems in rural Virginia are paratransit "demand-response" systems that pick up citizens on request. These transit systems are often designed to cater to elderly and disabled citizens and often do not have weekend or evening hours. Many rural areas of Virginia simply lack transit service altogether.

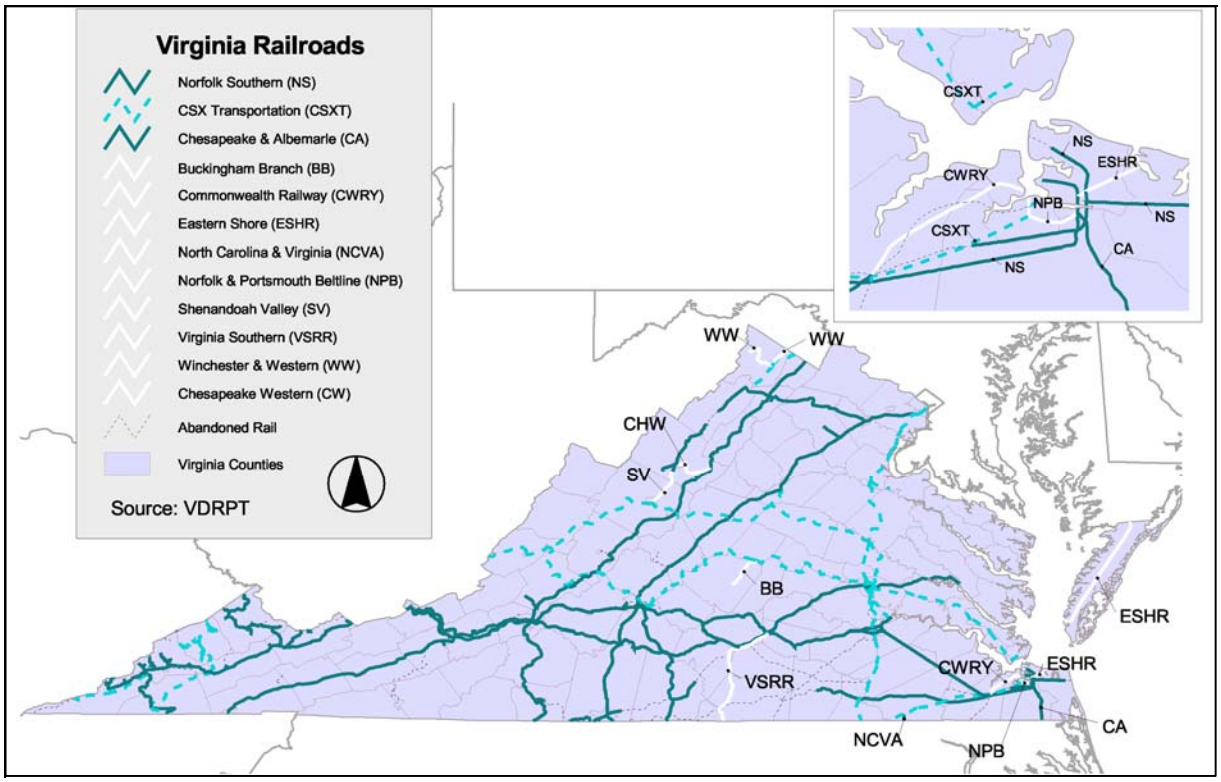
Rail

There are 12 railroads in Virginia operating on more than 3,000 miles of track, as shown in Figure 6. Freight railroads are categorized as Class I Railroads, Regional Railroads, Local Railroads, or Switching and Terminal Railroads. Class I Railroads are railroads with 2001 operating revenues of at least $266.7 million; two operate in Virginia. Regional Railroads are non-Class I line-haul operations with 360 or more miles of rail and/or with revenues of at least $40 million; none operate in Virginia. Local Railroads are railroads that are neither Class I nor Regional Railroads and are engaged primarily in line-haul service; five operate in Virginia. Switching and Terminal Railroads are non-Class I railroads engaged primarily in switching and/or terminal services for other railroads; two switching and terminal railroads operate in Virginia.

There is currently one provider of passenger rail service in Virginia. Amtrak operates along CSX tracks and provides intercity rail passenger service through Virginia on five routes that served 18 communities and 950,000 trips in 2000. In addition, studies are ongoing to

determine the feasibility of higher-speed passenger rail service from Richmond to Hampton Roads (along the Interstate 64 and/or Route 460 corridors), North Carolina to Washington D.C. and Bristol to Richmond and Washington D.C. There is a cooperative partnership with CSX to improve the tracks in the Washington D.C. to Richmond corridor.

FIGURE 6. VIRGINIA'S FREIGHT RAIL NETWORK



Airports

Nine of the Commonwealth's 67 public-use airports are considered commercial airports, providing scheduled commuter and/or air carrier services and logging more than 10,000 enplanements a year. The remaining 58 general aviation airports are defined as reliever, regional, community, or local service airports, depending on their function. Reliever airports provide runways, navigational aid equipment, and general aviation support facilities comparable to those found at commercial service airports, which helps reduce congestion at commercial service airports. Regional airport service areas are often multi-jurisdictional due to the geographic isolation or the relative scarcity of other airport services and facilities in the region. Community airports provide general aviation facilities and services to business and recreational users and typically serve a limited market area. Local service airports provide limited facilities to their respective communities. Aviation's contributions to the Commonwealth's economic well being are crucial, generating almost $10.8 billion in economic activity, 164,000 jobs and nearly $5 billion in wages.

Ports

VPA, the second largest general cargo marine terminal complex on the East Coast, owns four general cargo terminals: Norfolk International Terminals, Inc. (NIT), Portsmouth Marine Terminal (PMT), Newport News Marine Terminal (NNMT), and Virginia Inland Port (VIP). These four facilities are operated by a non-stock, non-profit Virginia corporation, Virginia International Terminals, Inc. (VIT). In order to maintain market share over the next four decades, the VPA plans to construct a fourth terminal, Craney Island Marine Terminal (CIMT). In addition, in April 2004, APM Terminals, a sister company of Maersk-Sealand shipping line – the largest shipping line in the world – announced plans to invest $450 million to construct a new 300-acre container terminal in Portsmouth. The Port of Virginia generates 165,000 jobs statewide and contributes $4.9 billion in personal income and roughly $667.5 million in state and local taxes.

Virginia's Economy

In recent years, employment growth in the Commonwealth has been greater than employment growth nationally, with the largest employment growth in the state's three large urban areas: Northern Virginia, Richmond, and Hampton Roads. Additional growth in these urbanized areas means more demand for transportation facilities and services to support employees getting to work, businesses procuring raw materials, and providers distributing finished goods and services.

Although unemployment rates vary widely by locality, some counties and cities report double-digit unemployment rates and others report shortages of particular types of labor. The highest unemployment rates occur in Southside Virginia, where textile, apparel, and furniture plants have closed. Improved transportation is seen as part of an overall effort to increase the economic competitiveness of these areas.

The largest share of Virginia's employment is in the service sector, with one third of the state's employment in industries ranging from laundry services to computer and data processing. In 30 years, the service sector has doubled its share of employment in the state, and the composition of industries is quite different today than it was a few decades ago. With jobs having nontraditional hours, existing transit services may not be well suited to accommodate this new demand, especially in areas with lower population densities.

Relative to other states in 2001, Virginia was ranked 12th in per capita personal income. Within the state, however, disparities exist between metropolitan and non-metropolitan areas. In 2000, per capita personal income in non-metropolitan areas was 30 percent below the statewide average. Higher incomes have historically correlated with increasing transportation demand.

Virginia is the 17th largest exporter state nationally and the 4th largest in the South Atlantic. Virginia businesses export manufactured goods to every geographic region in the world; major export destinations include Canada, Germany, Mexico, and the United Kingdom.

Facilitating goods movement in and through the state is and will continue to be vital to the state's economy.

Virginia's economy also benefits from the state's strategic location. The Port of Virginia is a gateway to the world marketplace, while Interstates 81 and 95 represent major north-south arteries for the movement of people and goods throughout the eastern United States. Virginia is within one day's drive of 50 percent of the nation's population and has enormous potential for attracting both business and leisure travelers. Tourism plays a vital role in Virginia's economy, ranking as the third largest retail industry and the third largest employer in the state. On an average day in Virginia, tourism generates more than $35 million in spending from lodging, meals, gasoline, shopping, and other related services.

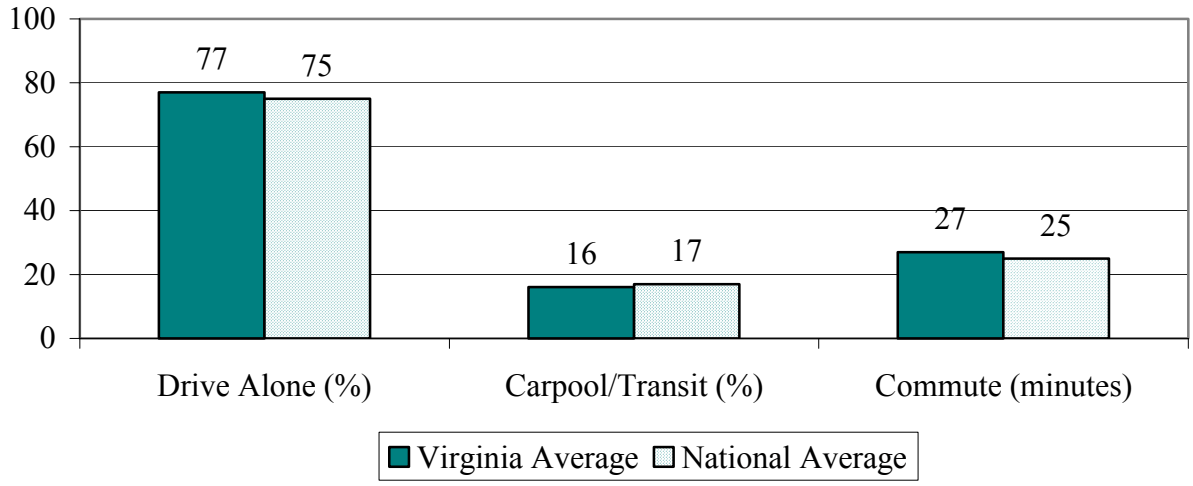
Transportation System Usage

Everyday, more than 200 million vehicle miles of travel occur on Virginia's roads. On a typical workday, more than 3 million passenger miles are traveled aboard vans, buses or rail transit vehicles operated by Virginia's public transportation systems going to work, school, and shopping. Many millions more are traveled aboard private carpools and vanpools going to and from work. In 2002, more than 19 million people boarded aircraft at Virginia's nine commercial airports. More than 12 million tons of general cargo were handled by VPA's marine terminals and more than 176 million tons of freight were hauled over Virginia's railroads.

By 2025, two million more people will live in Virginia, mostly in areas that are already heavily populated. Virginia's economy is expected to support 6.3 million jobs in 2025, up from 4.4 million in 2000. Most of the anticipated employment growth is likely to occur in counties located in and near the state's most populous areas, further exacerbating peak hour congestion. Household income and vehicle ownership are expected to continue to rise as well. If current trends continue, by 2025, vehicle miles of travel (VMT) is expected to increase in Virginia by 68 percent. Moreover, many of the currently non-urbanized areas of the state are expected to see significant growth by 2025. These areas will be faced with unique challenges in accommodating the associated transportation demand with the limited transportation infrastructure and services currently in place.

As shown in Figure 7, about 77 percent of Virginians currently drive to work alone compared to the national figure of 75 percent. Similarly, about 16 percent of Virginians carpooled or used public transportation to commute. The Virginia commute is slightly longer than the national average.

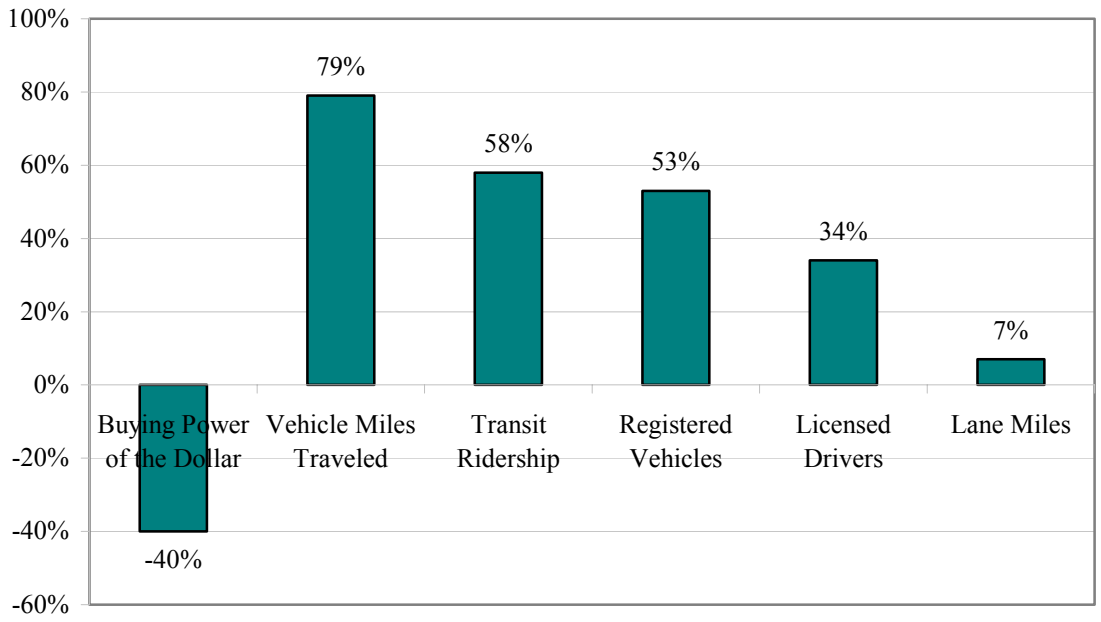
FIGURE 7. VIRGINIA COMMUTER FACTS



Transportation System Condition and Performance

Over the past 20 years, VMT, transit ridership, and the number of registered vehicles and licensed drivers in Virginia have steadily increased. As shown in Figure 8, however, this increase has not been matched by an increase in the number of lane-miles, which has remained largely stagnant.

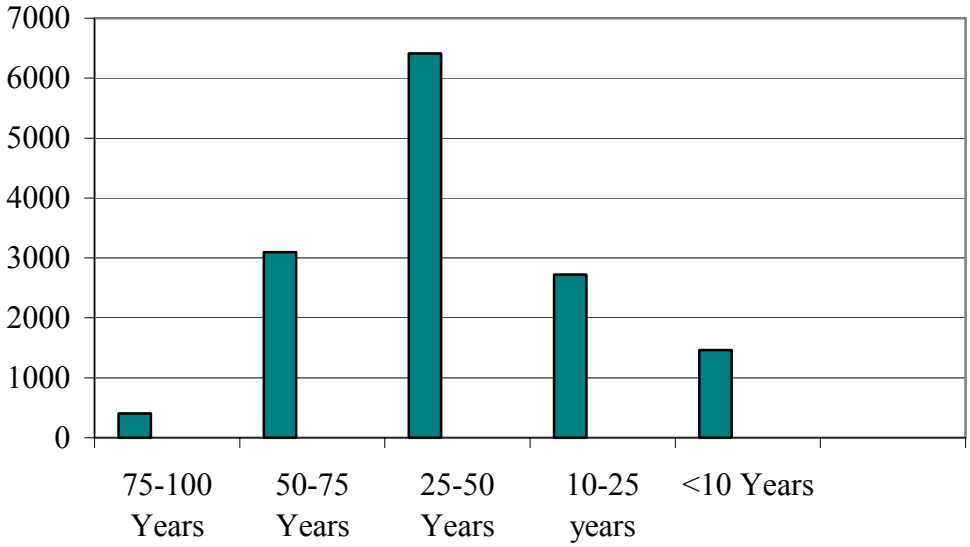
FIGURE 8. CHANGE IN TRANSPORTATION INDICATORS OVER THE PAST 20 YEARS



As a result, Virginia's extensive transportation network is largely composed of an aging infrastructure that is at or near capacity. Rising construction, service, and maintenance costs have resulted in an inability to keep pace with needs and the lack of additional investment has led to a decline in the performance of the transportation system.

As shown in Figure 9, a majority of the state's bridges are 25 years or older, 1,189 bridges are structurally deficient, and 2,229 are functionally obsolete (i.e., not wide enough to carry existing traffic). Moreover, today, 29 percent of the state's interstate lane miles and more than 30 percent of primary and secondary road lane miles are considered deficient in terms of capacity. By 2025, 79 percent of interstate lane miles, 49 percent of primary road lane miles, and 44 percent of secondary road lane miles will be considered deficient. Figure 10 shows the expected level of service performance level on Virginia's interstates in 2025. Level of service (LOS) measurements progress from LOS A, which represents free-flow traffic to LOS F, which indicates forced traffic flow characterized by stop-and-go waves, poor travel times, and increased accident exposure.

FIGURE 9. AGE OF BRIDGE STRUCTURES (2001)



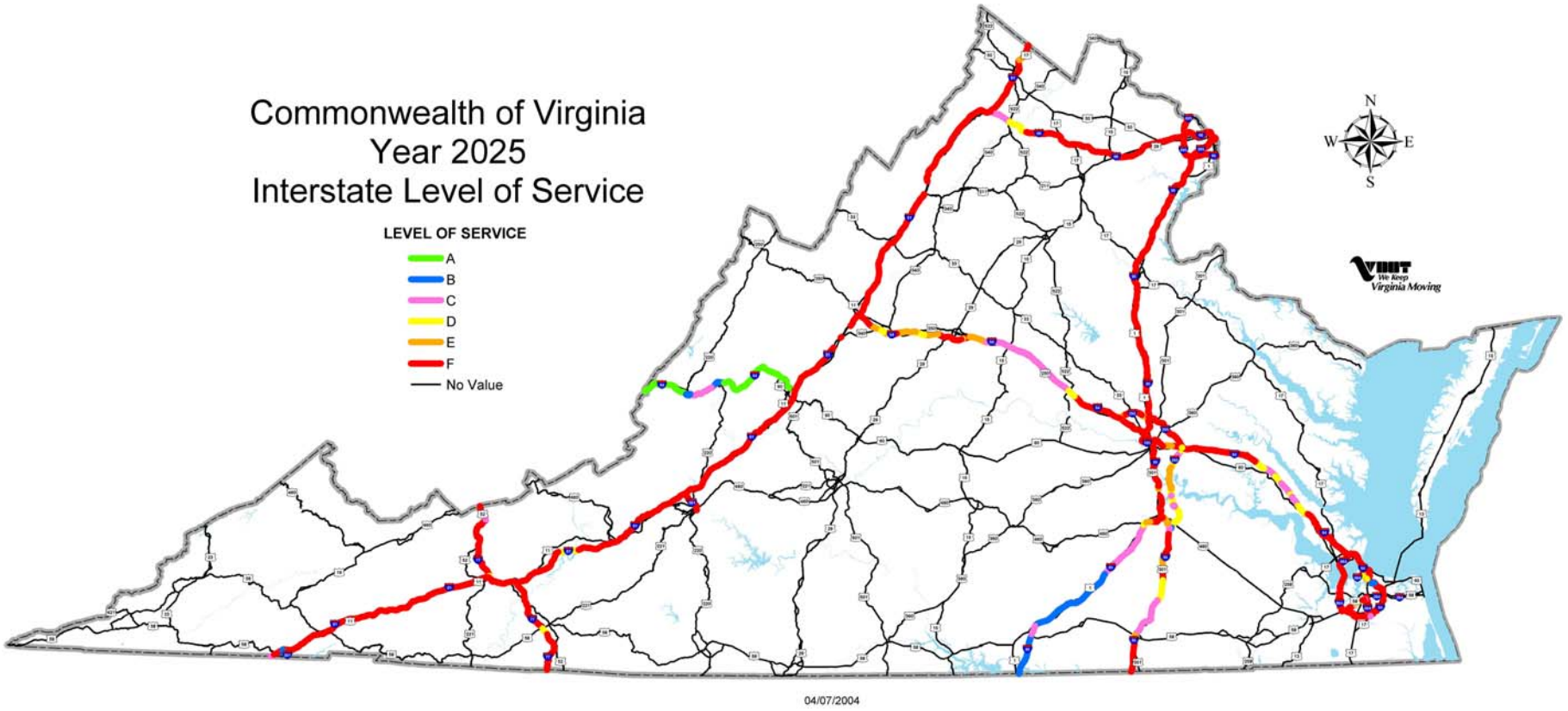
There are significant numbers of public transportation vehicles past the federally recommended replacement age in all regions of the state. More than 21 percent of the large transit buses (i.e., Class A) in the state have exceeded the recommended replacement age of 12 years. Similarly, VRE passenger cars have been rehabilitated to extend their lives, but the replacement age of 25 years is exceeded for all locomotives. The current funding level cannot maintain transit market share.

There are numerous "choke points" along Virginia's rail lines due to poor track conditions and alignment, tunnels too low for double-stack trains, and other factors that challenge the ability of the state's rail system to handle anticipated increases in freight movements and higher speed trains.

The Port of Virginia will reach full operating capacity by 2010 unless improvements are made. It will require significant modernization and expansion to maintain its place as one of the most successful networks of cargo handling marine terminals on the eastern seaboard.

The number of aircraft based at airports and the number of take-offs and landings are projected to increase 45 percent and 49 percent respectively by 2025. Likewise, forecasts indicate that commercial enplanements will more than double over the next 20 years, recording 43.9 million annual enplanements by 2025. Comparatively, over the next 20 years, Virginia's average annual growth rate for commercial enplanements is projected to be 4.5 percent, which far exceeds the U.S. forecast total of 2.8 percent.

FIGURE 10. EXPECTED LEVEL OF SERVICE ON VIRGINIA'S INTERSTATES IN 2025



CHAPTER 4. TRANSPORTATION ISSUES AND STRATEGIES

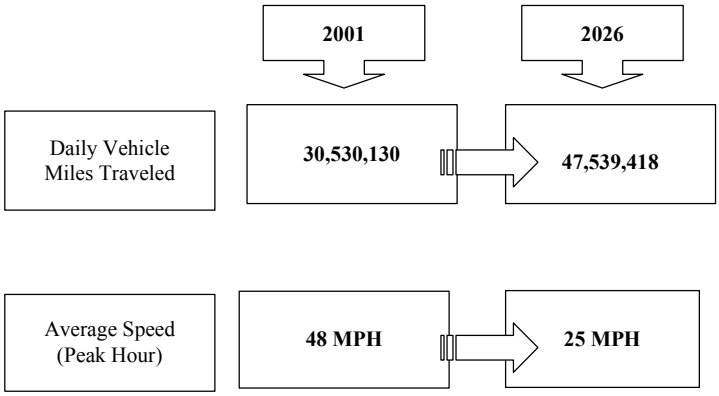
Demand for the transportation system is increasing, but our public investment in these facilities has not kept pace. This chapter describes transportation issues affecting the state's transportation system. These issues must be considered when planning our transportation investments in order to develop an improved system that works toward fulfilling the public's economic, social, and environmental goals. As described in this chapter, numerous factors influence the need to travel, many of which will have a significant impact on congestion and the safety of Virginia's transportation system.

Congestion

Traffic congestion is the level at which transportation system performance is no longer acceptable, and can be either recurring, such as during peak commuting hours, or non-recurring, the result of an incident, weather, or enforcement activity. More than half of all travel delay is caused by traffic incidents. In Virginia's larger urban areas, the annual delay from congestion is equal to more than one and a half workweeks. In the three largest urban areas in 2002, motorists experienced almost 157 million hours of travel delay and wasted 254 million gallons of gasoline ($434 million) idling in traffic. Travel delay is estimated to cost more than $2 billion per year in time alone. There are environmental impacts too, such as harmful air pollutants and noise.

Over the next 20 years, highway congestion levels are expected to increase. According to a recent report by HRPDC, 46 percent of the region's roadways were considered congested in 2001. VDOT's *2025 Highway Needs Assessment* reports similar findings for the region (see Chapter 8 for more information on the *2025 Highway Needs Assessment*). Figure 11 depicts what travel conditions will be in year 2026 in the Hampton Roads area, as estimated by the HRPDC, if increased funding and needed improvements are not realized. As illustrated, by the year 2026, VMT will increase by 56 percent and the average speed a person can expect to travel during peak hours will be reduced by almost one half.

FIGURE 11. IMPACT OF INACTION ON MOBILITY IN HAMPTON ROADS



In Northern Virginia, VMT is forecast to increase by 46 percent and lane miles by 13 percent by 2025. Truck trips are forecast to increase by 33 percent, vehicle trips by 38 percent. The Metrorail system has been experiencing transit congestion with record numbers of riders and crowding. The duration of the rush hour has also been increasing. A recent study by the Texas Transportation Institute ranked the Washington DC area as the third most congested (in terms of annual delay per traveler) urbanized area over 3 million in population.

Unless improvements are made, by 2025, 100% of the interstate lane miles and 72% of the primary road lane miles in Northern Virginia will be characterized by stop and go traffic, poor travel times, and decreased safety.

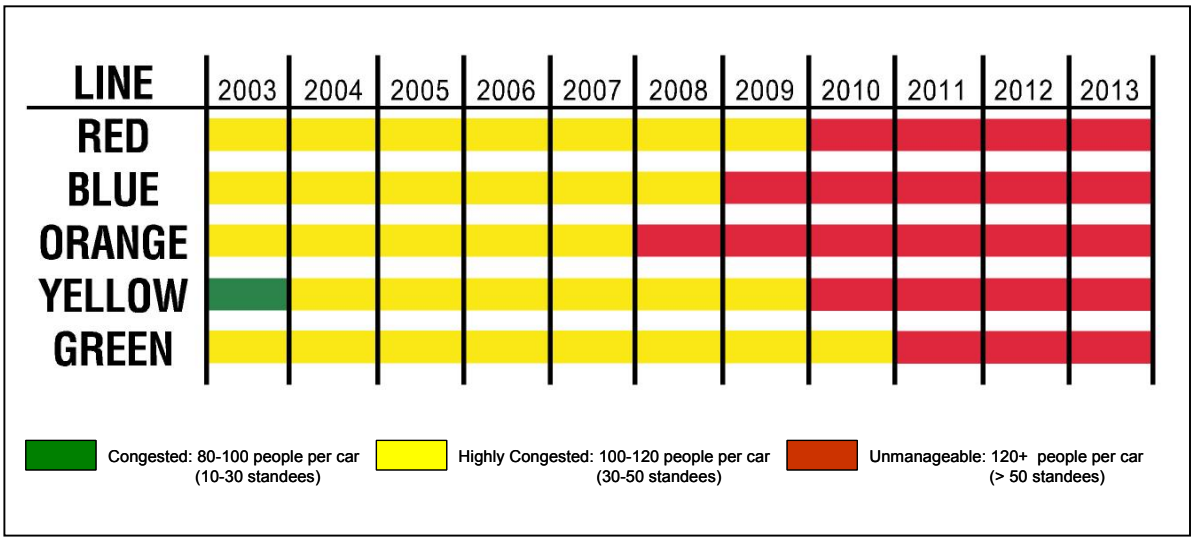
WMATA operates transit buses and the metro rail in the Washington DC area. Metro is seriously overcrowded. Average weekday ridership in June 2004 was 706,600 passenger trips. Metrorail ridership has grown steadily and has increased by more than 30 percent over the past eight years for an average annual growth of 3.8 percent. Approximately 42 percent of Metrobus riders have difficulty obtaining a seat every day. Transit use into the regional core has grown in the past few years to 42 percent of all person trips during the morning rush. A doubling of transit ridership by 2025 throughout the region is expected. Figure 12 illustrates Metrorail's overcrowding problem.

Congestion, however, is no longer just a big city problem. While it is not surprising that congestion is more severe in larger urban areas, smaller urban and even some rural areas are feeling the effects of increased traffic. While drivers in an urban area may be accustomed to sitting through two cycles of a traffic light, such a delay is typically unacceptable to drivers in rural areas.

Congestion is also not unique to roads. Increased volume and security, as well as other factors, make congestion an issue to airline and rail travelers, as well as freight movers. Virginia is part of a northeastern rail corridor, stretching from New York to Virginia, that is one of the most heavily traveled in the country, both for passenger and freight movement. Additionally, passenger service on privately owned freight lines introduces conflicts with the business activity of the railroads. Limited rail capacity is affecting agricultural and manufacturing interests in Virginia.

Ridership on VRE has grown dramatically, more than doubling over the past five years to approximately 16,000 passenger trips daily. Capacity restrictions limit the number of trains that can be operated over the CSX line, and storage capacity restrictions for mid-day train layovers in Washington, D.C. limit the number of cars that can be added to each train. VRE has successfully added passenger capacity to their service by replacing the majority of their single-level passenger cars with bi-level cars.

FIGURE 12. OVERCROWDING ON METRORAIL



Responses to Congestion

What is the solution? Major improvement projects can take years to realize. In that time, congestion endured by motorists continues to worsen. A 2004 Texas Transportation Institute report noted that due to the amount of time it takes to complete major projects, congestion endured by travelers will grow to those of the next largest population group. In other words, in 10 years, a medium-sized area will have the same traffic problems that large areas have if current trends continue. In *Traffic Congestion and Reliability: Linking Solutions to Problems*, Cambridge Systematics and Texas Transportation Institute identify three basic solutions to congestion and several strategies for implementation. The three approaches are as follows:

1. **Adding More Capacity by Expanding or Adding New Roadways, Transit, and Rail Service** – However, in many urban centers, adding traditional highway capacity is difficult, although transit service, HOV facilities, and demand management can be increased. Expanding intercity passenger and freight rail can be improved in some corridors.

2. **Operating Existing Capacity More Efficiently** – Operating the transportation system more efficiently involves mitigating the effects of incidents and managing short-term demand. Advanced technologies are used to provide real time information, to smooth traffic flows, and manage traffic incidents. In addition to technologies, other strategies improve operations, such as using reversible commuter lanes and access management techniques, eliminating bottlenecks, and converting HOV lanes to HOT (high occupancy toll) lanes.

3. **Encouraging Travel and Land Use Patterns that Use the System in Less Congestion Producing Ways** – Another approach relates to managing the demand for highway travel by enhancing travel in alternative modes, at different times of day, or not at all

(telecommuting). Facilitating better correspondence between land use and travel is also a key strategy.

Access Management

Access management is a set of techniques that can be used to control access to roadways, including systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections. It also encompasses roadway design features such as medians and auxiliary lanes, and traffic signal spacing. Managing roadway access has the potential to increase public safety, extend the life of major roadways, and reduce traffic congestion. It can support alternative transportation modes, and even improve the appearance and quality of the built environment while ensuring appropriate access to adjacent businesses and other land uses.

Section 33.1-59 of the Virginia code deals with designation of existing highways as limited access. The Code permits the CTB to designate all or any part of an existing highway as a limited access highway and, where necessary, to extinguish all existing easements of access. This is often difficult due to the expense of purchasing back the rights of way and the perceived negative impact to affected businesses and property owners.

A form of access management is being used by VPA to combat landside congestion at the port. Since the port's cargo volumes are at record levels, off-terminal empty container depots at NIT and PMT have been established to prevent terminal congestion. The port has also implemented a new chassis pool, the first in the U.S., that has significantly reduced truck turn times. Both of these innovative measures have prevented congestion that may have occurred otherwise.

Demand Management

Travel demand management is a way of addressing congestion by providing attractive alternatives to driving alone, such as transit, HOV lanes, ridesharing, flexible work schedules, teleworking opportunities, bicycling, and walking. Travel demand management, in its simplest form, makes the most efficient use of an existing transportation system by managing transportation demand; the focus is on people movement, not vehicle movement. Advanced technologies can also be used to help manage demand, as discussed in the Technology subsection of Chapter 4. While travel demand management strategies have been used very effectively to help manage traffic congestion and improve air quality across Virginia, they are not adequate to address all growing congestion problems. Rather they must be part of a mix of strategies.

Travel Demand Management Programs in Virginia

Rideshare in Virginia is in transition. In fact, even the term "rideshare" no longer fully captures all of the services offered by Virginia's fifteen commuter assistance programs and four Transportation Management Associations. Over the past 25 years, Virginia has developed one the most progressive commuter assistance networks in the country and has been a recognized

leader in developing innovative demand management programs to keep pace with Virginia's changing transportation needs. Innovative technologies and accompanying new services are more effectively helping a record number of Virginia commuters every day.

In addition to providing information and schedules for all of the transit services in a region, today's commuter agencies provide a wide range of services to meet both employer and individual commuter needs. Customers can call a commuter agency or even visit a commuter store to get information on all forms of transportation including transit, vanpooling, ridesharing, teleworking, biking, walking, or any other mode of transportation. Agencies provide employer services including relocation assistance to employers through the use of sophisticated GIS-based software, parking management, transportation assessments, commuter surveys, and on-site transportation promotions. Program managers work closely with businesses, planners, and commuters alike with the ultimate goal of changing commuting behavior.

Each commuter assistance agency is different, but all are designed to focus on local and regional market needs. For example, the Rappahannock Area Development Commission (RADCO) Rideshare located in Fredericksburg is overseen by the PDC and focuses on meeting the needs of long-distance commuters heading to Northern Virginia and Washington D.C. They manage one of the largest privately owned vanpool fleets in the country assisting nearly 300 vanpools carrying approximately 3,540 commuters to work daily (885,000 commuter round trips each year). They also promote and provide assistance for commuters using VRE commuter rail.

Charlottesville's RideShare program also falls under a PDC, but focuses on promotion of transit in the region including collaboration with Charlottesville Transit Service, Greene County Transit, JAUNT, and University (of Virginia) Transit Service. The five groups have collaborated on a website. Three programs, Traf*fix* in Hampton Roads, Ride Finders in Richmond, and OmniMatch in Prince William County, reside within or are operated directly by the regional transit agency.

A Model for Success

Travel demand management strategies have been successfully deployed to manage traffic congestion during major road construction projects like the Springfield Mixing Bowl in Northern Virginia. For the past several years, DRPT has worked closely with VDOT, local governments, other state agencies, and commuters to ensure a smooth commute during construction of the Springfield Interchange. Sophisticated research was utilized to provide travel demand management solutions that commuters wanted and used. Over the first four years of the project, strategies such as HOV incentives, discount bus passes, vanpool assistance, increased commuter rail, and Metrorail incentives were successfully launched – resulting in over 6,000 commuters changing the way they commute to work through this busy interchange.

Managed Lanes

HOV lanes are designed to help move more people through congested areas, allowing users to travel faster, while increasing the overall capacity of the system. At full capacity, HOV-2 lanes can move the same volume of passengers as four freeway regular lanes. In Northern Virginia alone, more than 50,000 people use HOV lanes during the morning and afternoon peaks. Park-and-ride lots are critical to the success of HOV lanes and other rideshare initiatives, including transit. Many park-and-ride lots, particularly in the Interstate 95 corridor, are at or near capacity.

Another approach to addressing congestion is to treat highways as economic goods and charge for their use. Efficient pricing would charge the most during peak hours when they are in great demand and lower prices during the off-peak. Termed valued pricing or congestion pricing, the charging of tolls for use of a highway can raise revenues, but its most significant purpose is to manage traffic. By charging higher rates during congested times, only those willing to pay the price will use the roadway. A form of congestion pricing is being considered for addressing airport congestion. Landing fees paid by airlines would vary with the level of congestion at the airport. Operating costs at peak hours would rise compared to off-peak costs, leading to a redistribution of traffic as airlines shift some flights away from the peak.

A subset of the HOV concept is HOT lanes. In this situation, single occupant automobile drivers are allowed to use HOV lanes if they pay a toll. Generally, the tolls vary with the congestion level and are set to ensure free flow of traffic on the lane. While initially feared to be "Lexus lanes," existing HOT lanes were found to attract individuals–and support–from all economic strata. Faced with a penalty charge for being late to pick up a child at daycare, missing an interview, being late for work, or going home with a sick child are among the many situations everyone encounters where the need for fast, reliable transportation is worth paying for.

In Virginia, proposals have been received to develop HOT lanes on Interstates 495, 95, and 395 in partnership with the private sector. Virginia is currently participating in the Value Pricing Pilot Program where the Commonwealth would be able to charge tolls on the interstate if the analyses were to evaluate the initiatives favorably. A similar study will be developed in the Hampton Roads area as well.

Strategies to Address Congestion
• *Increase transportation system capacity for all modes by adding lanes, expanding HOV and HOT lanes, increasing bus service, and removing bottlenecks.* • *Enhance the operational efficiency of the transportation system through use of access management, ramp metering, provision of real-time transit information, and similar techniques.* • *Increase strategies to reduce system demand (e.g., travel demand management strategies) and support land use plans that protect the capacity of the existing transportation infrastructure.*

Land Use

All states, including Virginia, have techniques for coordinating transportation and land use planning, but in Virginia, state agencies, localities, and PDCs currently influence the coordination of land use and transportation planning in different ways, as described below.

State Agencies (VDOT and DRPT)

- **Regulatory authority** – The CTB is authorized by §33.1 of the *Code* "[t]o make rules and regulations, from time to time, not in conflict with the laws of this Commonwealth, for the protection of and covering traffic on and the use of systems of state highways." Current (2004) regulations that can be used to coordinate transportation and land use planning include the Subdivision Street Requirements, the Minimum Standards of Entrances to State Highways, and the Land Use Permit Manual. The practical application of these regulations has often been limited to the review of the safety and construction details of individual entrances rather than a systematic assessment of the impact on the entire network.

- **Advisory capacity** – VDOT, DRPT, and PDCs work with localities in an advisory role, providing technical expertise on the transportation impacts of land use plans and development proposals.

Localities

Local comprehensive plans, which present a long-term vision for growth in the locale are required by the *Code* and must include a transportation element. Although the plans themselves are not binding, they set the stage for using three mechanisms available to localities: zoning ordinances, subdivision ordinances, and site plan reviews.

- **Zoning ordinances** specify where and what types of development are permitted.

- **Subdivision ordinances** are required by the *Code* and are the procedures a locality follows when a landowner elects to subdivide land, usually for development. These ordinances may specify details for streets, intersections, and rights of way, and localities may use them to ensure that the standards of the roads are sufficient to be accepted into the VDOT secondary system. VDOT also influences transportation and land use criteria through its Subdivision Street Requirements and criteria for accepting privately maintained streets into the state system.

A pilot project was initiated by VDOT and Botetourt County as a result of an anticipated interchange redesign for Exit 150 of I-81. Because the reconstruction would take land, relocate businesses, and create new developable land, the Botetourt County Planning Commission, the Botetourt County Board of Supervisors, and VDOT desired to coordinate the new transportation improvements and the adjacent land uses, including how the land should be zoned. Impacts on the transportation system of various land use scenarios were evaluated and estimates of delay at key intersections as a result of particular land uses were provided to the county for consideration.

- **Site plan ordinances** are essentially design requirements that must be met for a commercial development proposal to be approved. They may include provisions for adequate and safe entrances, provide for VDOT review and comment on the proposal, and specify how automobiles and transit vehicles must be served by the site.

Planning District Commissions

PDCs are regional entities set up to achieve coordination in a number of areas, including land use. Because of the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) giving MPOs a greater role in the selection of transportation projects, the influence of PDCs, which staff the MPOs, except in Northern Virginia, has increased over the past decade.

The Caroline County pilot project has a countywide focus, with emphasis on two of the county's three primary growth areas. Road improvement needs will be specified for the county's thoroughfare network and for the road networks in the growth areas. Needs for other modes will also be discussed. VDOT will work with the county to develop a program to address identified needs. The pilot was initiated in June 2003 and expected to be complete by December 2004.

Limitations on Virginia's Ability to Coordinate Transportation and Land Use Planning

Virginia has several limitations on its ability to coordinate transportation and land use planning, including:

- **Public facilities ordinances are not permitted** – "Adequate Public Facilities Ordinances," as practiced in other states, would allow a local government to apply LOS standards at the time of plan review and/or building permit issuance. This mechanism can ensure that adequate public facilities are in place when the development occurs. In Virginia, non-cash and non-mandatory proffers are allowed in high growth areas when rezoning.

- **Virginia is a Dillon's Rule state**, which means that any power enjoyed by a locality must spring from an express grant by the legislature. In contrast, in a Home Rule state, municipalities have an inherent freedom to control their own affairs. Being a Dillon's Rule state does not necessarily eliminate the possibility of coordination; 39 states apply this rule in some fashion.

- **There are numerous jurisdictions in Virginia, and each has local zoning powers**. Because there are 95 counties, 39 cities, and 194 incorporated towns in Virginia, there are 328 jurisdictions that can make independent land use decisions.

- **Planning, construction, and maintenance responsibilities rest with the state, whereas land use decisions are the responsibility of the locality** – Only four states in addition to Virginia (Alaska, Delaware, North Carolina, and West Virginia) leave maintenance and construction of county (generally secondary) roads with the state; other states generally place some degree of responsibility for these roads on the county. Thus,

except for roads within incorporated cities and towns with populations greater than 3,500, Henrico County, and Arlington County, significant planning, construction, and maintenance responsibilities rest with the state, whereas land use decisions are the responsibility of the locality. However, counties receive secondary road funding and significantly influence the secondary road program by working with the VDOT resident engineer. Urban localities may influence any road projects that require federal funds where the MPO, of which VDOT is a member, programs projects for its Transportation Improvement Program.

- **VDOT's regulatory authority over entrances to state highways cannot be exercised at the zoning stage of a development proposal, when proffers are being negotiated.** As a result, VDOT staff reviewing rezoning may make recommendations regarding only transportation impacts and suggested proffers. Since transportation impacts and VDOT recommendations are but two criteria for determining whether or not to approve a rezoning, localities may elect to ignore VDOT's recommendations if other aspects of the development proposal are appealing.

Options for Coordinating Transportation and Land Use Planning

There are several approaches used in other states to coordinate transportation and land use planning, including:

- Decentralize planning authority to the county, city, and regional level – This could be accomplished through requiring consistency between local comprehensive plans and subsequent local actions, enacting legislation that gives greater authority to counties to form regional compacts, and expanding the decision-making powers of PDCs or localities. An example of the latter would be to allow local governments to require proffers or impact fees when new development is proposed (current law in Title 15.2 of the *Code* allows proffers or impact fees only as part of a rezoning request).

- Provide additional resources to local or state organizations for the purpose of planning coordination and/or increase the role of PDCs – Staff or funding may be dedicated to the purposes of developing more complete comprehensive plans or subdivision review ordinances or for coordinating land use plans.

- Set a policy goal for what coordination should achieve – There is no consensus on the desired outcome of land use and transportation coordination. There are conflicting interests that would promote different policy goals, such as providing transportation facilities for any land use that exists, encouraging compact development, providing a wide range of land development options for consumers, providing greater transportation choices, and aligning transportation infrastructure development with land use goals.

- Give the state greater authority to accomplish access management – Title 33.1 of the *Code* provides that commercial establishment entrances meet the *Minimum Standards of Entrances to State Highways*. It could be amended to require meeting a Comprehensive Access Management Program.

- Transportation decision-making and land use determination at the same level of government – Land use decisions are made at the local level and transportation decisions are generally made at the state level. This separation of responsibilities gives rise to a number of problems – traffic generated by development may exceed the transportation system's capacity; land development patterns and building site designs may not accommodate alternate travel modes; and, transportation investment decisions may accelerate development in an area that might not otherwise have developed in the same way or at the same pace. This presents a fundamental problem and until the governance structure is addressed, no transportation plan can completely address the issue. Having the same entity responsible for decision-making for transportation projects and land use would ensure greater coordination and consistency between them.

  Currently, cities with population greater than 3,500 maintain the local road systems within their boundaries and receive payments to do so from the state. The First Cities Initiative (passed in 2003) enables them to assume responsibility for the construction program as well, and three cities have signed agreements to do so. Henrico and Arlington receive payments from the state to operate and maintain their local road systems. In 2001, the law was changed to allow any county to assume all or a portion of the maintenance, construction, and operational responsibility for the local roads in their county.

- Change the allocation formulas and programming practices such that localities that strive to coordinate land-use and transportation planning are rewarded with more transportation funds than localities that do not practice this coordination through their zoning, site plan, and subdivision ordinances.

- Localities could include specific transportation-related provisions in their zoning, site plan, and subdivision ordinances such as*:*

  - Maximum development thresholds based on traffic impacts.
  - Requirements that alternative modes such as transit, bicycling, and walking are accommodated, similar to the manner in which single-occupant vehicles are accommodated through parking ordinances.
  - Requirements that travel demand management techniques be included in the site design.
  - Requirements that proposed developments be consistent with MPO plans or forecasting models, VDOT corridor studies, or statewide transportation plans.

- Expand Chapter 22, Article 3, Section 15.2-2119, of the Code to include an impact fee for transportation infrastructure.

- Planning authority at the state level – Some states have a single agency with full land planning authority, that reviews localities' comprehensive plans, and/or have legislation that dictates specific ways in which planning should occur. Other states give their department of transportation the ability to deny a local zoning action based on traffic impacts or other technical criteria, or require state approval of all zoning, site plan, and subdivision ordinances.

Strategies to Address Land Use
• *Expand the use of pilot projects to study the transportation impacts of alternative land use scenarios.* • *Encourage localities to evaluate the transportation impacts of alternative land use scenarios and provide technical expertise to support these efforts.* • *Provide incentives to localities to encourage the protection of transportation investments from the negative impacts of incompatible land uses.*

Rural Transportation Issues

Although the different regions of the state have different economies, natural settings, and transportation facilities, all of them depend on the state's transportation system. In rural areas, characterized by greater geographic dispersion and few alternatives to the automobile, transportation is often viewed as a stimulus for economic development and the transportation system is usually heavily oriented toward highways. Transportation planners must focus not only on the obvious problems inherent in urban areas, such as congestion and transit needs, but also recognize the unique issues that arise in rural areas.

Rural residents make up 27 percent of Virginia's population and the lack of sufficient and convenient transportation is one of their most frequently cited problems. Many of the more than 200,000 households in Virginia without an automobile are in rural areas where there are fewer transportation options. The *VTrans2025* survey (see Appendix B for more information on the survey) found that respondents from smaller areas expressed more interest in transportation that supports economic competitiveness, while those from larger areas showed stronger support for actions that enhance intermodalism and mobility. Further, unlike a large urban area where residents focused on non-highway alternatives, residents in rural areas felt road improvements were more important.

Investment in rural transportation systems can have a dramatic impact on a state's economy. Enhancing transportation accessibility to rural areas not previously served by major transportation infrastructure (e.g., rail, highway, airport) can open up new markets and provide job access. Additionally, raw materials and agricultural products generally originate in rural areas and inadequate facilities for moving these materials out of rural areas increases distribution costs and ultimately the cost of the finished product. Transportation access alone, however, does not generally transform a rural area into an economic center.

More than 70 percent of Virginia's state-maintained roads are in rural areas. Many of these roads are winding and rolling and have poor site distances. As a result, a disproportionate number of traffic fatalities occur. Although rural transportation issues vary according to the specific needs of the individual area, the topography, and the location, there are many common threads, including:

- A considerable amount of freight passes through rural areas, mostly in large trucks. These trucks can negatively impact roadway conditions, thereby increasing maintenance costs, without providing any economic benefit to the area.

- Over 200,000 households in Virginia do not own vehicles. Not surprisingly, many of these households are in rural areas, making available transit service as important to rural residents as it is to urban dwellers. However, low population densities and high distances between origins and destinations present problems in providing services.

- More than 97 percent of Virginians are within 30 minutes of a general aviation airport or 45 minutes of a commercial service airport. Many of these airports in rural areas, however, need better landside access, runway improvements, navigational aids, and facility development.

- Although rural areas encompass a significant portion of the transportation system, the use of intelligent transportation systems (ITS) on rural highways is a recent development. The unique characteristics of rural roads, such as the mix of traffic from rural and urban areas, combination of recreational and commercial users, large variance in travel speeds (often requiring excessive passing), and fewer navigational signs require unique ITS efforts, not simply those adapted from urban ITS practices.

Each year VDOT works with citizens in communities throughout the Commonwealth to help them get their roads paved through the Unpaved Roads Program. Roads must be included in Virginia's secondary system of state highways and carry 50 or more vehicles per day to qualify for unpaved road funds. There are two options for paving unpaved roads: the Rural Rustic Road Program and the Pave-in-Place Program. The Rural Rustic Roads Program is for roads carrying 500 vehicles or less per day and expecting to see minimal growth and traffic increase over the next 10 years. The Pave-in-Place Program is for roads carrying 750 vehicles or less per day and requiring only minimal improvements within existing rights of way.

FTA's Rural Transit Assistance Program (RTAP) is aimed at providing training and technical assistance for rural public transportation operators, improving professionalism and safety of rural public transit services, promoting efficiency and effectiveness of rural transit services, and supporting coordination with human service transportation. Also at the federal level, FTA's 5311 Program provides operating and capital assistance to public transportation systems in non-urbanized areas. These funds provide support to 17 public transportation systems in the Commonwealth. In 2004, $1.9 million in capital assistance funds was programmed for the purchase of 39 replacement vans/lifts and one support vehicle. In addition, $9.5 million in operating assistance and $114,000 in technical assistance and training was programmed. FTA assistance to Virginia under this program totals $11.6 million.

Also at the federal level, the Rural Transportation Initiative was developed to improve transportation safety in rural areas, provide rural residents access to destinations and goods, and provide transportation service that allows rural areas the opportunity to reach their economic growth and trade potential. The program is intended to improve safety by decreasing highway deaths and injuries and improving medical response time, providing non-automobile alternatives for those who cannot or choose not to drive, and allowing rural areas and small communities the opportunity to compete on an equal footing for the business created by the provision of new and different transportation services.

Strategies to Address Rural Transportation Needs
• *Expand travel choices in rural areas.* • *Encourage local governments to provide enough detail in their transportation element of their local comprehensive plan to support identification of transportation priorities at the state level.* • *Increase collaborative efforts with resource agencies.* • *Address safety concerns in rural areas.*

Economic Development

Nearly all transportation has an economic component—either promoting economic renewal or addressing infrastructure capacity issues created by economic expansion. Providing the infrastructure and workforce needed to support a growing economy is important to Virginia's position in the world marketplace. In some cases, transportation improvements provide direct economic benefits by reducing costs of transportation by expanding the accessibility of businesses to suppliers, labor, and consumer markets and by attracting new business to a community. However, transportation improvements serve not only to generate growth but also to redistribute economic activity from one locality or region to another.

Transportation Funding Programs that Support Economic Activity

In recent history, the creation of highway infrastructure has provided the greatest measurable stimulus to economic growth. However, the return on investment in highway infrastructure has diminished over the past two decades as the interstate system has been basically completed. While studies have found that transportation improvement in general leads to economic growth for a locality or region, other economic development projects (e.g., workforce development, technology investment, etc.) must be a part of the overall initiative.

Tourism has been an engine of economic growth in Virginia, expanding more than 47% over the past 10 years. It creates a significant number of jobs and is a substantial source of revenues.

Virginia has several transportation funding programs designed, in part, to support economic activity, including the following:

- The Recreational Access Program assists localities in providing access to public recreational or historic areas owned by the Commonwealth or a local government. The program is administered by VDOT under the authority of §33.1-223 of the *Code* with the concurrence of the Director of the Department of Conservation and Recreation, and approved by the CTB.

- The Railroad Industrial Access Program assists localities in providing rail access to new or expanding industries. The program is managed by DRPT. Funding is provided through VDOT's Industrial, Airport, and Rail Access Fund and approved by the CTB.

- The Industrial Access Program provides adequate roadway access to industrial development sites. Adequate access, in consideration of the type and volume of traffic anticipated, may require the construction of a new roadway, improvement of an existing roadway, or both to serve the designated site. The program is administered by VDOT under the authority of §33.1-221 of the *Code*.

- The Airport Access Program assists localities in providing adequate access to licensed, public-use airports. Adequate access, in consideration of the type and volume of traffic to be generated by the subject site, may require the construction of a new roadway, improvement of an existing roadway, or both to serve the designated site. The program is administered by VDOT under the authority of §33.1-221 of the *Code*. Funding for these projects is provided through VDOT's Industrial, Airport, and Rail Access Fund and approved by the CTB.

- The Transportation Enhancement Program fosters more choices for travel by providing funding for sidewalks, bike lanes, and the conversion of abandoned railroad corridors into trails. Communities also use the program to revitalize local and regional economies by restoring eligible historic buildings, renovating streetscapes, or providing transportation museums and visitor centers. Many communities also use the program to acquire, restore, and preserve scenic or historic sites.

Aside from specific funding programs aimed at supporting economic development, providing basic transportation services and facilities also generate economic activity. The trolley that provides transportation along the boardwalk in the Virginia Beach resort area supports commerce in the area; public transportation that provides job access or access to major activity centers such as shopping malls, convention centers, and others also support economic activity.

Another example is the Virginia Inland Port in Front Royal. It is a cornerstone for economic development in the northwest corner of the Commonwealth having attracted 23 major distribution centers to the region. As an intermodal collection point for cargo from West Virginia, Ohio, Pennsylvania, Northern Virginia, and elsewhere, it extends the reach of the Port of Virginia 220 miles inland to the Shenandoah Valley at the intersection of Interstate 66 and Interstate 81.

The New Starts Program sponsored by the Federal Transit Administration (FTA) is the federal government's primary financial resource for supporting locally planned, implemented, and operated transit "guideway" capital investments. From heavy to light rail, from commuter rail to bus rapid transit systems, the New Starts Program has helped to make possible hundreds of new or extended transit fixed guideway systems across the nation. These rail and bus investments, in turn, have improved the mobility of millions of Americans, have helped to reduce congestion and improve air quality in the areas they serve, and have fostered economic activity in the corridor.

The federal Job Access and Reverse Commute Program provides grants targeted at improving access to economic opportunities for low-income and minority populations. Job access funds improve mobility and economic opportunities by providing new or expanded transportation services. Reverse commute funds improve mobility to suburban employment sites for the general public, as well as low-income individuals.

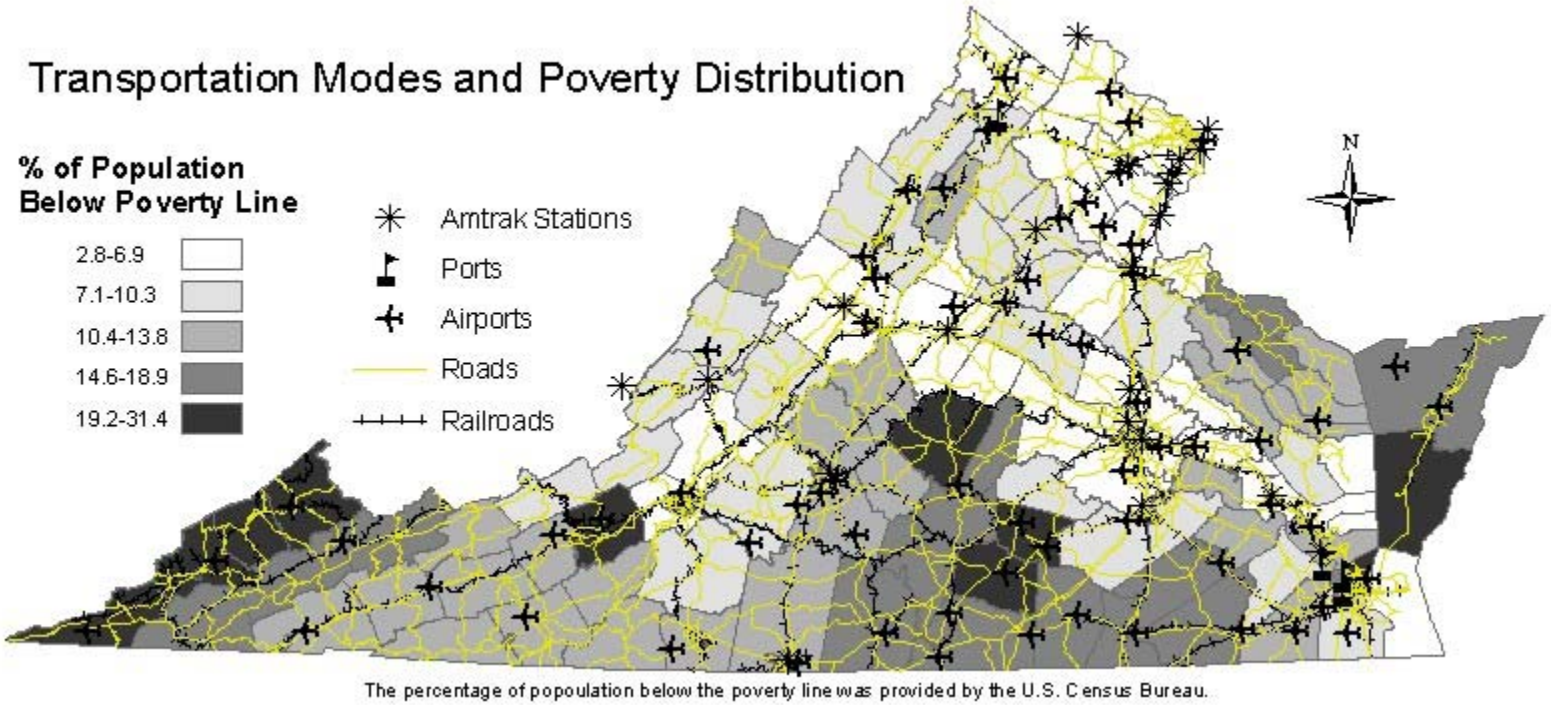
Implications for Virginia's Economy

Different regions of Virginia have prospered at differing rates. Although the reasons for these differences are long-standing and complex, it is clear that some regions of the state simply do not have the level of transportation access (or other conditions) desired by many industries. Many areas of the state lack the infrastructure and environment necessary to attract and support technology and other emerging businesses. Figure 13 displays the relationship between poverty and transportation facilities. The greatest potential for economic growth in the future appears to be through enhanced accessibility to rural areas not previously served by a major highway network. For areas that have experienced significant economic expansion and as a result are faced with capacity conflicts and congestion, sustainable growth will likely be maintained by providing increased travel reliability and modal alternatives. Regions and localities that have experienced stagnant economic growth or loss will require more coordinated approaches that combine economic stimuli such as job training, tax incentives, incubation strategies as well as improved transportation infrastructure. However, rarely does transportation access in itself transform a rural area into a hub of economic activity.

Strategies to Support Virginia's Economy

- *Give special attention to the congestion and mobility problems of the major metropolitan areas.*
- *Expand transportation access (e.g., highway, transit, rail, and aviation) to support economic opportunities in rural areas.*
- *Collaborate with the Economic Development Partnership on statewide initiatives.*
- *Encourage development of distribution centers and inland ports with appropriate transportation access.*

FIGURE 13. TRANSPORTATION MODES AND POVERTY DISTRIBUTION



Asset Management

The *Code*, (Section 33.1-23.1(B)), requires funding the maintenance of the transportation system before funding capital improvements. Rather than use last year's expenditures as this year's budget, the expenditures on maintenance must be strategic and reflect improvements over the total life cycle of the assets. Virginia needs to invest in strategies that extend the life of the system and optimize across all assets.

Asset management is defined in the *Code* as "a systematic process of operating and maintaining the system of highways by combining engineering practices and analysis with sound business practices and economic theory to achieve cost-effective outcomes." (33.1-23.02 (B) 1)

This section focuses on highways because they are the major transportation asset the state owns and maintains. Localities and independent authorities own and maintain significant rail, transit, port, and airport assets.

Highway Approach to Asset Management

As mentioned previously, Virginia has the third-largest state-maintained highway system in the country. The system is aging and requires increased maintenance, the costs of which have climbed 4 percent per year. Nearly $1 billion of VDOT's $3.4 billion annual budget is allocated for VDOT's maintenance and operations activities. Another $263.4 million from the Highway Maintenance and Operating Fund (HMOF) budget is allocated to all cities and two counties for the maintenance of their streets and other programs.

In 2002, the Virginia General Assembly passed legislation that required VDOT to incorporate the principles of asset management into its maintenance and operations practices and to submit biennial reports that document performance targets and compare actual conditions to those targets. The goal is a true needs-based maintenance budget for VDOT. An asset management program has been developed which includes the following actions:

- Produce and maintain a comprehensive and accurate inventory and condition dataset.
- Develop statewide maintenance budget requests based on needs identified during a formal condition assessment process.
- Plan, prioritize and schedule maintenance and operations work based on available resources.
- Improve the cost-effectiveness of maintenance and operations activities by monitoring work and evaluating resulting performance.
- Determine the impact of deferred maintenance strategies on network performance and resulting needs.
- Maintain a record of work on an asset throughout its life cycle.

- Develop a consistent approach to statewide service delivery.

Approaches of Other Modes to Asset Management

Well-designed asset management systems for other modes have the same features as noted above. They should include an inventory, performance criteria, and condition evaluations. They should employ life cycle analysis and development of prioritization schemes for selecting maintenance/repair options over the life cycle. Having such a system allows the decision maker to determine how and when to make investments on vehicles and other fixed assets to maintain or improve them, estimate the backlog of investment requirements, and predict the future requirements of the upcoming fiscal year (FY). Optimization techniques allow for the determination of how to get the best results overall in the system with the budget that is available. And, by taking into account future conditions as a consequence of present maintenance, the best action can be determined.

- Responsibility for maintenance of transit systems lies with local governments; DRPT provides technical assistance.
- DOAV provides assistance to localities to develop, maintain, and improve aviation facilities.
- The federal government has significant regulations regarding the maintenance of rail infrastructure.

Strategies to Address Asset Management

- *Continue implementation of a "maintenance first" policy.*
- *Increase use of new materials, technologies, and strategies that reduce long-term maintenance costs.*
- *Support continued development of Asset Management Systems, including inventories, performance criteria, and condition evaluations for all modes.*
- *Reduce disruption due to maintenance.*

Safety

The traveling safety of the public is one of the most basic concerns of transportation agencies. *VTrans2025* outreach efforts confirm that safety is a top priority for Virginia's residents.

Ensuring the safety of Virginia's transportation system poses unique challenges for each mode:

- Many highways serve as evacuation routes in the event of emergencies or other disasters and their safe and efficient operation are essential for the delivery of goods, people, and services in support of emergency operations.

- Currently, passenger rail in Virginia travels on the infrastructure owned by the private sector. Expanding commuter and intercity rail systems provides new and better service, but adding these to the existing rights of way often creates conflicts with freight movement, resulting in safety problems.

- Highway-rail crossings have long-been considered a safety concern. In Virginia, there were 34 train/vehicle crashes in 2003, resulting in 4 fatalities and 11 injuries. The majority of these crashes were due to driver inattention, ignoring traffic controls, or failing to yield. Most highway-rail collisions occur when motorists try to beat a train at grade crossings fully equipped with automatic warning devices.

- With the amount of freight transported by rail expected to increase dramatically over the next 20 years, rail crossings near intermodal facilities, ports, major rail yards, and switching areas will experience significant increases in train and truck traffic. The result will be that more crossings will be closed to traffic for long periods – blocking emergency vehicles, exacerbating the existing safety concern, and increasing congestion.

- Runway incursions, surface incidents involving an aircraft, vehicle, person, or object on the ground that creates a collision hazard, are a multifaceted problem at all airports and have been increasing at an alarming rate. Airport-specific factors such as infrastructure, procedures, operations, and environment interact with traffic volumes and influence the potential for runway incursions.

- Many roadways and intersections do not address bicycle and pedestrian needs, making it difficult for bicyclists, pedestrians, and motorists to travel together safely. The lack of physical space, high traffic volumes and speeds, and a mix of large vehicles and trucks can make bicycling unsafe. Most often, traffic control devices do not adequately address pedestrian needs to use the intersection. Further, facilities that are not properly maintained present additional danger to bicyclists and pedestrians.

Safety Issues in Virginia

One safety issue for Virginia's drivers is the large amount of truck traffic. The mixing of trucks with vehicular traffic can cause conflicts. In 2003, 129 persons were killed in crashes involving trucks (straight trucks, tractor trailers, and tractor twin-trailers). Eighty-two percent of those who died were drivers or passengers of the vehicle involved in the crash, not the occupants of the trucks. It is important to note that in most crashes involving a passenger vehicle and a truck, the driver of the vehicle contributes to the cause of the crash. Too often, the vehicle driver does not consider that although a passenger vehicle traveling at 55 miles per hour can stop in about 130 feet, a large truck traveling at the same speed requires 400 feet to stop.

In 2003 in Virginia, 361 people were killed (38.3 percent of all traffic fatalities) in alcohol-related crashes, down from 479 in 1985 when DUI laws went into effect.

The growing elderly population will also significantly impact transportation safety. Seniors have higher rates of fatal crashes than all but the youngest drivers, older drivers do not deal as well with complex traffic situations, and multiple-vehicle crashes at intersections increase markedly with age. People 65 years of age and older have a greater probability of causing a fatal crash at an intersection, and approximately half of these fatal crashes involve drivers aged 80 years of age and older. Older drivers are more likely to receive traffic citations for failing to yield, turning improperly, and running stop signs and red lights. In Virginia in 2003, 17 percent of all vehicle-related deaths were persons over the age of 65.

On the other end of the age spectrum, in 2003 in Virginia, nine percent of drivers killed in vehicles crashes were between the ages of 16 and 19. Teen drivers have the greatest crash risk of any age group and are many times more likely to die in a crash than their parents. Per mile traveled, they have the highest involvement rates in all types of crashes, from those involving only property damage to those that are fatal.

In 2003 in Virginia, 2.6 lives are lost per day due to traffic crashes and there is 1 crash every 3.4 minutes.

Intersections are disproportionately responsible for pedestrian deaths and injuries. Almost 50 percent of combined fatal and non-fatal injuries to pedestrians occur at or near intersections. Most often, traffic control devices do not address pedestrian needs to use the intersection, lacking pedestrian phases, pedestrian signals, or activated push-buttons that add to a pedestrian's safe passage across an intersection. Pedestrian casualties from vehicle impacts are strongly concentrated in densely populated urban areas where more than two-thirds of pedestrian injuries occur. Crashes in urban areas are mostly attributed to conflict points such as intersections, whereas crashes in rural areas are usually attributed to lack of pedestrian facilities. Figure 14 shows the causes of crashes in Virginia.

FIGURE 14. CAUSES OF CRASHES IN VIRGINIA

Cause	Percent of Total Crashes	Percent of Fatal Crashes
Driver Information (All Types of Crashes)		
Driver Violated Traffic Law	88.6	58.6
Driver Violated Speeding Law	11.2	22.0
Driver Drinking	7.1	13.5
Driver Physical Impairment	3.6	6.3
Pedestrian Information (Pedestrian Crashes Only)		
Pedestrian Violated Law	97.2	93.1
Pedestrian Drinking	11.4	23.0
Pedestrian Physical Impairment	5.6	9.2
Vehicle Information (All Types of Crashes)		
Defective Vehicle	2.6	3.8

Overview of Safety Facts in Virginia

In 2003, there were 154,848 crashes resulting in 942 fatalities and 78,842 injuries on the Commonwealth's roads. On average, one crash occurs every 3.4 minutes, involving one out of every 19 drivers. Close to three lives are lost and 216 injuries occur each day. These transportation-related crashes take a large toll on lives and productivity and have a serious impact on Virginia's economy, costing the state more than $3.2 billion every year.

- 942 persons were killed, up 3.18% from 2002.
- 78,842 persons were injured, down 0.07% from 2002.
- 154,848 traffic crashes were reported, up 4.81% from 2002.
- While Virginia's death rate increased 1.65 percent over the past year, the overall long-term trend is decreasing.

Virginia's highways provide the infrastructure for travel by many modes, including cars, trucks, buses, motorcycles, bicycles, and pedestrians. When highways intersect with rail lines, additional safety issues are created. Figure 15 shows the percentage of various types of crashes.

FIGURE 15. 2003 CRASH SUMMARY (SELECTED CATEGORIES)

Vehicle Types Involved	Percent of All Crashes	Percent of All Fatal Crashes
Automobiles	73.8	63.1
Bicycles/Motor Vehicle	0.5	1.0
Pedestrians/Motor Vehicle	1.2	10.1
Trains/Vehicles	0.0	0.3
Straight Trucks, Tractor Trailers & Tractor Twin-Trailers	6.1	13.6

In 2001, there were 37 aviation crashes in Virginia. The majority of these crashes occurred during takeoff or landing. Virginia has an accident rate per 100 flight hours flown of 6.95 as compared to the national rate of 5.56.

Strategies to Address Safety Issues

- *Recognize changes in the population that impact transportation safety and take measures to ensure safe mobility.*
- *Identify and address critical safety issues and corridors and implement VDOT and other safety plans.*
- *Increase transportation system user education and enforcement through collaboration with law enforcement, federal and state agencies, and others.*

Security

Security is a major concern to Virginia's travelers and if they have observed a transportation facility or service to be insecure they will change their travel behavior. This could include such actions as avoiding air travel, avoiding particular stations and terminals that are perceived to be targets, avoiding routes with critical links that may be targets (e.g., bridges, tunnels), and avoiding group travel. In an effort to increase security and decrease risks, transportation providers often negatively impact convenience and ease of travel. Inconveniences such as luggage limitations, increased need for personal information, and restrictions on particular vehicles are burdensome to the traveler, affecting their experience and often their travel choices.

Security Challenges

The unique characteristics of seaports, such as their physical layout, location, and function make them vulnerable to security threats. The intersection of many different transportation modes (e.g., rail, roads) at the port and the heavy concentration of high-value cargo and hazardous materials increase this potential.

Transit systems are designed not only to provide open, easy access to passengers but also to run under or alongside our largest business and government buildings, intermodal transportation centers, and many of our most visible public icons, making ensuring security a challenge.

Many highways, railroads, and airports serve as critical routes in the event of emergencies or other disasters and are essential for the delivery of goods, people, and services in support of emergency operations. Railroads transport more than 40 percent of the nation's goods and products and provide critical support to the more than 30,000 miles of the Department of Defense Strategic Rail Corridor. The consequences of a major attack on any portion of the transportation system would undoubtedly be devastating, having both mobility and economic consequences.

Virginia's Response

The Office of Commonwealth Preparedness is charged with developing a seamless, coordinated security and preparedness strategy for Virginia. The office works with federal, state, and local officials, as well as the private sector, to promote security measures. Governor Warner's Secure Virginia Initiative created a Secure Virginia Panel charged with improving the Commonwealth's preparedness and response and recovery capability for natural disasters and emergencies of all kinds, including terrorist attacks.

The Virginia Department of Emergency Management, the state agency responsible for protecting the lives and property of Virginia's citizens from emergencies and disasters, works closely with local governments, other state agencies, and the federal government to ensure a comprehensive, efficient, and effective response to emergencies and disasters throughout Virginia. The department provides resources and expertise in emergency preparedness, response, recovery, and mitigation.

In response to the lack of federal or state security regulations for general aviation airports, DOAV established the General Aviation Voluntary Security Certification Program to encourage the state's 58 general aviation airport sponsors to develop airport security plans, reducing the risk of aviation assets being used as instruments of terror. To encourage participation in this program, priority will be given to capital projects requested by an airport that has been certified. In addition, DOAV is establishing a process by which state aircraft licensing records can be cross referenced and matched with databases developed by FAA, the federal agency charged with ensuring safe, secure, and efficient flight. This information will be used to determine aircraft demographics more accurately.

The Port of Virginia is the only port in the nation to have, in place and fully-operational, a radiation detection system that scans import containers for the presence of radioactive material that could indicate the presence of a nuclear weapon or a radiation dispersal device. Other security measures include new closed-circuit television surveillance systems, fencing, and biometrics-based identification cards to secure access to the port. To date, federal seaport security grants totaling $11.4 million have been awarded to VPA.

VDOT developed an Emergency Operations Plan that directs the agency to work with local governments and other state agencies to plan and prepare for disasters and to simultaneously respond to life-threatening situations; to open those routes essential for the delivery of goods, people, and services in support of emergency operations; and, to restore the Commonwealth's roadway system as quickly and as safely as possible. The Emergency Operations Plan also addresses plans for evacuation, both for hurricanes and radiological disasters.

VDOT's Transportation Emergency Operations Center (TEOC) serves as a statewide center for disaster and emergency information and resources. The TEOC operates on a 24-hour-a-day basis and keeps all VDOT organizations, as well as the State Emergency Operations Center, informed via the Virginia Operational Information System. The Northern Virginia, Hampton Roads, and Richmond Smart Traffic Centers (STCs) perform similar functions on a regional basis.

The events of September 11, 2001 changed the way transportation security is performed and managed in the United States. A secure transportation system cannot be accomplished without strengthened partnerships among federal, state, and local government officials, as well as the private sector.

Strategies to Address Security
• *Continue to coordinate with the Department of Emergency Management and other state and federal agencies on security issues.* • *Continue to cooperate with military, public, private, and other emergency responders.* • *Continue to upgrade security at critical transportation facilities.*

Outlook for Freight

The movement of freight across our nation's intermodal transportation system is vital to the U.S. economy. According to the U.S. Bureau of Transportation Statistics' April 2004 report *Freight Shipments in America*, transportation goods and services accounted for more than 10 percent – over $1 trillion – of the Gross Domestic Product in 2002. In that same year, transportation and related industries employed almost 20 million people. In the next fifteen years, the amount of freight using the nation's intermodal transportation network is expected to double. In Virginia, freight movements are expected to increase dramatically over the next 20 years – by about 80 percent for trucks, 40 percent for rail, 300 percent for air, and 100 percent through the port – further taxing the capacity of the state's freight terminals and infrastructure.

Impact On Virginia

Due to its strategic location, Virginia plays a key role in our nation's intermodal transportation network. The Commonwealth's seaports are important international gateways for bulk (coal) exports and commodity imports, while Interstates 81 and 95 represent major north-south arteries for the flow of cargo throughout the eastern U.S. This brings an economic benefit to the state; however, it also presents many challenges to transportation planning and infrastructure. Figure 16 shows the amount of freight moved by each mode in 2001, and Figure 17 shows the breakdown in origin and destination for truck freight moving throughout Virginia that same year.

FIGURE 16. 2001 VIRGINIA FREIGHT DISTRIBUTION (TONS OF FREIGHT IN MILLIONS)

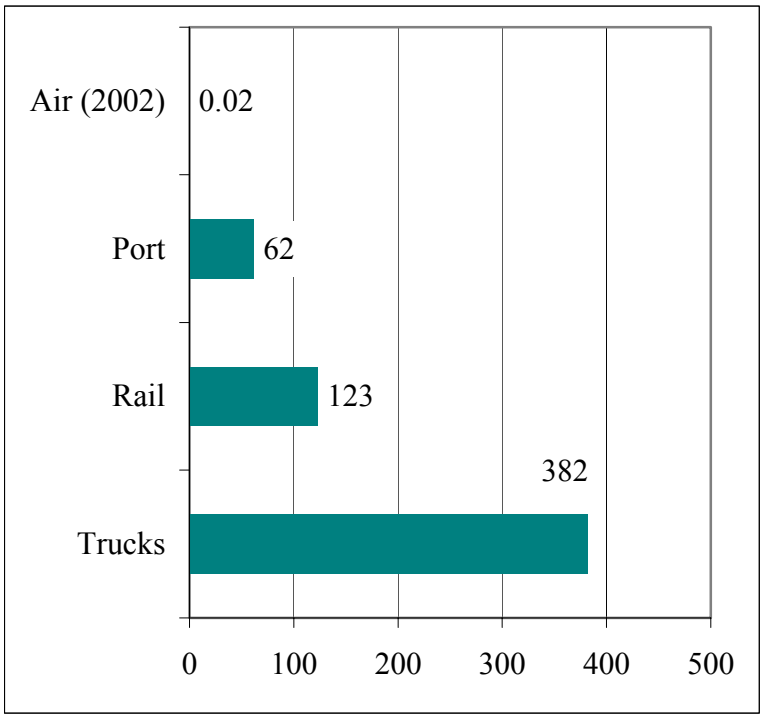
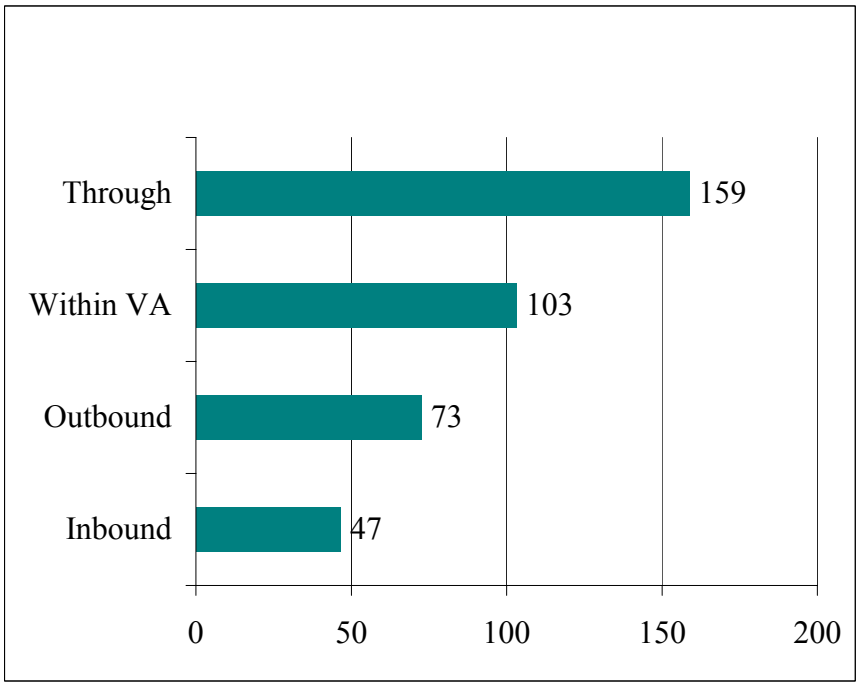


FIGURE 17. 2001 VIRGINIA TRUCK FREIGHT ORIGIN/DESTINATION BREAKDOWN (TONS OF FREIGHT IN MILLIONS)



A fully loaded 18-wheeler does 6,000 times more damage to dry roads than do full-size cars.

The advantages of carrying freight by truck include speed, door-to-door delivery, and dependable, flexible service. Trucks are typically used for shorter, time-sensitive trips. Where reliability is negatively impacted by congestion, alternatives are sought. Rail freight has a lower cost, is safer, has greater fuel efficiency, and produces around one-third the particulate matter and nitrogen oxide emissions of trucks. Not all trips, however, can be made by rail. In a recent DRPT study of freight movement in Interstate 81 corridor, more than 10 percent of the average annual daily traffic (474,000 to 501,000 annual truck loads) could be diverted to rail if improvements were made to the Norfolk Southern Corridor in Virginia. If surrounding states also made improvements to the rail system, it is estimated that 30 percent (approximately 3 million truck loads) could be diverted.

Advances in freight logistics have been one of the major sources of productivity increases in the last several decades. Major efficiency improvements have been associated with communications, technology, and just-in-time inventory management. These improvements could be threatened by increased bottlenecks within the freight transportation network, including congested highway corridors, poor rail infrastructure, and insufficient channel depths.

At full build-out, Craney Island will generate 5,000 trucks per day in the Hampton Roads Region.

Existing highway corridors in Virginia are currently operating at or over capacity for freight traffic. For example, when it was originally designed in the 1950s, Interstate 81 was intended to carry traffic comprised of 15 percent trucks. However, in some sections, trucks now represent as much as 35 percent of overall traffic using the highway. This has safety implications as more and more trucks mix with passenger car traffic. It also impacts roadway design and maintenance.

In 2001, the Port of Virginia moved 11.5 million tons of cargo through the Hampton Roads Region – one of the most congested urban areas of Virginia. According to the Virginia Virginia Port Authority's *2040 Master Plan*, containerized freight at Virginia's three marine terminals is expected to double over the next 15 years. Further, container vessels are growing in size to meet market demand and these vessels require deeper water, resulting in the need for dredging existing channels.

Increasingly, major importers are locating important distribution facilities near the port as well as further inland to take advantage of the port's access to the world's trade lanes. Because of its efficiency and accessibility to two Class I railroads and interstate highways, the port has attracted and continues to attract the nation's largest retailers and distribution centers; Target, Wal-Mart, Cost Plus, and Home Depot are among more than 40 companies that have invested millions of dollars and employ thousands of Virginians throughout the Commonwealth. The Port of Virginia is surrounded by urban areas and faces growing traffic congestion on the major truck routes that serve the terminals. It will be difficult for existing access routes to accommodate the amount of truck travel that will be generated in the future. As congestion increases, so do transport costs and vehicular emissions. Without investment in the port, many opportunities will be lost to other competing regions hungry for economic growth.

Virginia's rail networks currently transport large amounts of coal and other bulk commodities such as paper, lumber and grain. It is estimated that it would take more than nine million annual truck trips to transport the same amount of freight currently moved by rail in Virginia. The shift from bulk to containerized cargo, coupled with projected overall cargo growth, will require rail infrastructure to accommodate more and more containerized cargo in the future. While much of Virginia's rail system is currently operating below capacity, there are significant chokepoints. Many grade crossings hinder free flow and there are not sufficient tunnel clearances to allow double-stack trains to leave the port and head west into West Virginia and Ohio.

Air freight tonnage is expected to increase by nearly 300 percent in Virginia by 2020 and occupy approximately 12 percent of the value of the market for freight shipped. Virginia's primary air freight terminal is Dulles International Airport in Northern Virginia. Dulles offers extensive international air cargo capabilities and is located within a two-hour flight or one day's truck journey of approximately two thirds of the U.S. and Canadian populations—about 16 percent of the world gross national product. Air freight is typically carried by two types of aircraft: wide body and narrow body. Wide body aircraft is the preferred mode because the cargo can be containerized. Accessibility for air freight, therefore, is dependent on an airport's ability to serve wide body aircraft. Because of their larger size and weight, these aircraft require at least a 9,000-foot runway.

Major State Initiatives

Many argue that investments to expand the capacity of the freight rail system can be a cost-effective way to increase the total transportation system capacity. Having a viable rail system reduces the number of trucks on the roads, reduces harmful emissions, and is vital to military mobilization. It can be said to serve a public purpose, which is why some departments of transportation are investing in rail.

Productivity gains and competitive rates have not been sufficient to rebuild market share and increase revenue for railroads. Railroad revenues have continued to drop. According to AASHTO's *Transportation Invest in America: Freight-Rail Bottom Line Report,* the industry's return on investment improved from about four percent in 1980 to about eight percent in 2000; however, it is still below the cost of capital at 10 percent. Shippers have been the main beneficiaries rather than railroad investors, which has had the effect of backing investors away from railroad stocks. This has reduced the amount of money that can be employed in capital expenditures – in an industry that is characterized by AASHTO as "extraordinarily capital-intensive." Acting alone, neither the private nor public sectors have sufficient capital to make the necessary rail improvements.

A number of projects have been identified that will ease congestion statewide while also improving Virginia's ability to accommodate future freight traffic. These projects include:

- **Interstate 81 Improvements** – Launched by VDOT in January 2004, the Interstate 81 Corridor Improvement Study will provide factual information about the problems along

Interstate 81 and help determine what can be done to address those problems. Once the study is complete, steps must be taken to ensure that improvement measures are carried out.

- **The Heartland Corridor Initiative** – The Heartland Corridor initiative proposes the expansion of a major rail freight corridor stretching from Norfolk to Chicago. This route will cut 233 miles from the existing route and reduce travel time by a day and a half. Ancillary components of the initiative call for the removal of a residential rail corridor to a safe and secure highway median rail corridor and the construction of an intermodal transfer facility adjacent to Interstate 81 in order to alleviate congestion.

- **Interstate 95 Rail Corridor Study** – VDOT and DRPT are engaged with a five-state consortium in evaluating the capacity of the rail system through the Interstate 95 Corridor. A study called the Mid-Atlantic Rail Operations Study is assessing ways to make the rail corridor a more viable option to handle the future growth of freight by determining the existing bottlenecks and assessing the measurable benefits of improving them.

- **Interstate 64 Improvements** – Work is currently underway to widen a section of Interstate 64 between Newport News and the Hampton Roads Bridge Tunnel in Hampton Roads. Future projects may include additional lanes to the west between Newport News and Richmond.

- **U.S. Route 460 Improvements** – Originally part of the national "TransAmerica Corridor" designated by Federal transportation legislation in 1991, the Route 460 Corridor location study is currently underway to identify and evaluate potential improvements to Route 460 between Hampton Roads and Richmond.

- **The Commonwealth's Rail Plan provides for the incremental construction of a third track from Richmond to Washington D.C.** This will improve operations and reliability, and allow for increased freight and passenger traffic.

- **Regional Projects in Hampton Roads** – The following initiatives were designed to alleviate regional congestion in Hampton Roads and also benefit the movement of freight:

    - Third Harbor Crossing
    - Interstate 564 Connector (Norfolk)
    - Hampton-Greenbrier Grade Separation (Norfolk)
    - Hampton-Terminal Boulevard Grade Separation (Norfolk)
    - Pinner's Point Interchange (Portsmouth)

Without significant investment in the state's freight moving capacity, Virginia will be faced with increased congestion and travel unreliability and increased air and water quality concerns.

Strategies to Address Freight
• *Increase investment in the state's freight movement infrastructure, including maritime and inland ports, rail, highways, and aviation facilities.* • *Facilitate coordination between private and public interests on freight issues.* • *Consider establishment of a Freight Council made up of stakeholders and others in the industry.* • *Establish a Freight Office to increase attention to freight movement.*

Intermodal Connectivity

A critical, but often overlooked aspect of the transportation system relates to the connectivity among modes. Ideally, transportation networks should function as webs—interconnected and seamless. Transportation modes are interrelated, and problems in one mode spill over into another mode. A single inadequate connection in the transportation system can reduce the efficiency of the overall system. To ensure the availability of a full range of modal choices and to improve access, efficiency, and throughput of the system, connections among modes must receive special attention. Providing choices and improving the ease of connections among modes offer opportunities for significant improvements in transportation productivity.

Connecting People

Long-range intermodal planning must focus on connections among automobile, rail, airline, and transit passengers. A primary emphasis of passenger intermodalism is improving connections among modes. Transit users begin or end their journeys as pedestrians, bicyclists, or motorists. Park-and-ride facilities provide a critical connection for mass transit commuters using an automobile for a portion of their trip and often are key to guaranteeing high ridership on major transit systems and HOV lanes that support carpools and vanpools. Addressing passenger needs from an intermodal perspective will help ensure that access to all modes is convenient and available.

Connections for bicyclists and pedestrians to transit services increase the distance they can travel, thereby increasing the attractiveness of walking and cycling. Coordinating planning for bicycles, pedestrians, and transit benefits each mode. Including accommodations for bicyclists such as racks on buses, storage space on commuter or light rail train cars, bicycle racks at bus and rail stations and park-and-ride lots, and facilities such as bike lanes that allow cyclists reach the stations and lots promotes the connection between bicycling and transit. Similarly, pedestrian improvements include usable facilities to reach bus stops, transfer centers, and rail stations (e.g., sidewalks, marked crosswalks, curb ramps); amenities at bus stops such as benches and shelters; and, facilities and amenities that are accessible for the disabled, convenient, and safe. In an effort to promote equal treatment of the modes, the CTB directed VDOT to give nonmotorized transportation the same consideration as motorized transportation in the planning, design, construction, and operation of Virginia's transportation network, ensuring that bicycle and pedestrian features will be incorporated where appropriate.

Connecting Freight

The movement of freight from origin to final destination is accomplished increasingly through the use of more than one mode. Most freight transfers to trucks before final delivery, making the planning of connections between highways and other modes critical to eliminating intermodal bottlenecks. The interface between modes at these intermodal transfer points, including highway access to truck terminals, air freight terminals, railroad transfer facilities, and seaports, is vital to the economic prosperity of the state.

The Stephen's City weigh facility on I-81 is testing the electronic operability of commercial vehicle-related information systems and networks. Technology is being used for electronic collection of inspection data, electronic application for motor carrier credentials, and weight data collection. Weigh-in-motion technology permits inspection of commercial trucks as they pass a weigh station, eliminating the need to stop.

Air cargo is generally multimodal with many shipments being trucked as far as 1,000 miles on each end of their journey. Air cargo is typically low-tonnage, high-value, time-sensitive material. As a result, unexpected congestion on the ground can be an acute problem. Ensuring efficient truck access to airports is a critical intermodal connection. Virginia's primary air freight terminal is Dulles International Airport in Northern Virginia. Dulles offers extensive international air cargo capabilities reaching 29 foreign markets with nearly 200 weekly flights. It is located within a two-hour flight or a day's truck journey of approximately two-thirds of the U.S. and Canadian populations—about 23 percent of the world gross national product.

Seamless Connections and Current Barriers

By definition, intermodal projects span multiple modes of transportation, making their planning, financing, and implementation difficult. Similar to transportation planning at the federal level, transportation planning in Virginia has traditionally been conducted by four modal agencies—DOAV, VDOT, DRPT, and VPA. Each mode has its own characteristics, stakeholder relationships, funding systems, regulatory requirements, and planning processes.

Automated toll collection systems use a tag placed on the vehicle's windshield or license plate to communicate electronically with a computer that automatically deducts the toll from a prepared account as the driver passes through the lane. In August 2003, Virginia joined the E-ZPass system that covers several northeastern and mid-Atlantic states. This creates a seamless system and will permit Virginia's travelers to use the automatic toll facilities from Maine to Virginia and keep traffic moving.

The lack of connections between transportation modes and roadways can cause congestion, inconvenience, and safety issues. Creating links and removing barriers between transportation facilities and services can reduce total travel time and shipping costs while improving existing travel options. However, there are significant barriers to efficient and convenient travel in Virginia. Barriers to intermodal connectivity

include those that are physical as well as those that are institutional. Physical barriers include poor access to general aviation airports, lack of park-and-ride facilities adjacent to HOV lanes, insufficient clearance for double-stacked trains, and lack of bicycle and pedestrian facilities at transit stations. Institutional barriers include policies that discourage intermodal projects and organizational structures. There are several instances in the state of barriers to intermodal connectivity resulting from the lack of coordination between the many different agencies and programs responsible for delivering transportation services, poor coordination on project completion or implementation schedules, and other factors.

Investments that focus on creating an integrated system that permits travelers to move freely between modes are key to facilitating seamless connectivity. There are numerous examples of this type of investment in Virginia, including:

- Park-and-ride lots serve as key intermodal facilities that support linkages between multiple modes and increase ridership for high occupancy travel. Statewide, Virginia has 340 park-and-ride facilities available to commuters, including 114 operated by VDOT, 56 private lots, and 13 municipality-operated facilities. In addition, there are more than 100 unofficial lots, which have developed wherever there is a need or the space.

- Multimodal transportation centers include multipurpose passenger facilities where several modes meet and passengers can make connections. The success of these centers depends in large part on the ability of passengers to make smooth transitions and exchanges. Easy access to multiple modes, intermodal drop-off and pick-up facilities, parking and storage areas, traveler information, and pedestrian walkways are all critical components.

- Inland ports serve as intermodal collection points for cargo and extend the reach of seaside ports inland to critical rail or highway connections. Located at the intersection of Interstates 81 and 66 in Front Royal and operated as an intermodal container transfer facility, VIP provides an interface between truck and rail for the transport of ocean-going containers to and from the Port of Virginia. Containers arrive at the inland port by both truck and rail and are dispatched to inland destinations.

There is a great potential for both economic growth and improved transportation system efficiency through improved connectivity between transportation networks and modes. Accomplishing this, however, requires a new way of transportation planning. Transportation planning at the state level must give priority to groups of multimodal projects that are of statewide significance and work toward a common vision for transportation in the Commonwealth. Priority must be given to projects that upgrade intermodal facilities, provide access to them, and improve connectivity. Planning must consider the "complete journey"—movement of passengers and goods from start to finish and all links in between—to facilitate construction and operation of a transportation system in which all of the modes interconnect to provide seamless travel throughout the state. One of the six *VTrans2025* goals addresses these issues by making provision of easy connections between different facilities and services throughout the state a priority.

Strategies to Address Intermodal Connectivity
• *Encourage development of infrastructure that facilitates seamless connectivity, such as park-and-ride lots and multimodal transportation centers.* • *Evaluate transportation alternatives (e.g., rail, transit) and accommodation of alternate modes (e.g., bus pull outs, etc.) in the early stages of planning for new construction or major reconstruction.*

Accessibility and Mobility for Special Needs Populations

An equitable transportation system provides basic transportation services for all citizens. Of particular concern are issues of transportation accessibility for special needs populations, such as the elderly, lower socioeconomic groups, and the disabled. People with lower incomes spend a larger percentage on basic energy and transportation needs than do middle-class and wealthy households. In some cases, being unable to afford a car means being unable to hold a job. Further, the disabled and elderly in Virginia face challenges in finding convenient transportation because of mobility limitations such as physical, sensory, or cognitive impairment. Residents of rural areas face special problems due to their wider geographic dispersion, fewer transportation mode choices, and limited access to arterial highways and interstates. Even in densely populated areas, where transit service is more available, accessibility issues continue to present difficulties for many transportation users, particularly those with other mobility challenges.

Public transportation service is lacking in many areas of the state, and the number of households without access to personal vehicles is increasing. Approximately 17 percent of the state's population resides in cities, towns, or counties without public transportation service. The number of households without an automobile was more than 200,000 in 2000, with many of these households located in rural or small urban areas, where transit service does not exist.

Adequate access to jobs, childcare, health care, shopping, and other goods and services are vital to everyone. As such, accessibility to transportation resources is an essential issue in transportation planning. Federal law and executive orders reflect the importance of ensuring accessibility for all transportation system users, including:

- **Americans with Disabilities Act**. Signed in to law in 1990, the ADA requires any facility that is open to the public (e.g., restaurants, offices, sidewalks, buses) to be accessible to people with disabilities.

- **Air Carrier Access Act of 1986**. The Air Carrier Access Act of 1986, which predates ADA but has the same intent, ensures access to airports and airlines by people with disabilities.

- **Environmental Justice**. A 1994 Presidential Executive Order directed every federal agency to make environmental justice part of its mission by identifying and addressing the effects of all programs, policies, and activities on "minority populations and low-

> income populations." At the federal level, there are three environmental justice principles: to avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations; to ensure the full and fair participation by all potentially affected communities in the transportation decision-making process; and, to prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

Accommodating groups such as the elderly, lower income individuals, and the disabled benefits more than just people with special needs. Ensuring a wheelchair user's access to curb ramps also helps an able-bodied parent pushing a stroller or a senior citizen wheeling a cart of groceries. Supplementing signage with auditory cues at crosswalks also helps those who are temporarily distracted or forgetful.

Accessibility for Seniors

By 2025, nearly one in five Virginians will be over the age of 65. This suggests an increased need for specialized transportation services and more leisure travel. In addition, it suggests a need to encourage land uses that reduce automobile dependence and to design transportation systems that accommodate the needs of older drivers. Nearly two-thirds of the elderly population lives in rural and suburban areas, where specialized transit services are limited, even nonexistent, and where traditional transit services are not well suited. Transit usage by the elderly today is low; future usage is likely to be challenging. Transportation planning must encourage land uses that reduce automobile dependence and accommodate the needs of older drivers.

There are many ways to accommodate the needs of the elderly in transportation planning. Integrating transportation and land-use planning by promoting mixed-land uses, infill development, and higher densities would serve the accessibility needs of older people. Ensuring pedestrian accessibility, convenience, safety, and security would also make many locations more accessible to the elderly. Further, transit service could be more accessible to older individuals through improving conventional transit service, increasing safety and security throughout the system, enhancing communication and information, and providing specialized services targeted to the elderly.

Most forms of transportation have accessibility issues for the elderly. Long before older individuals are unable to drive, they may become unable to walk long distances or board transit buses or trains. When driving becomes unavailable, most elderly individuals must rely on specialized transit services, usually provided by transit operators in association with regular transit service. Many elderly individuals do not live close to existing bus lines and some do not meet the eligibility requirements for demand-responsive services. Small paratransit services are available in most communities, provided by non-governmental organizations, public and private social service agencies, and agencies supporting the aged. These programs, however, do not serve a large portion of the elderly population.

Future senior citizens will be more educated, healthier, and more active and will have more income than seniors today. High-quality transit services will be needed to entice tomorrow's older individuals. Many older travelers are likely to require transportation services that are reliable, flexible, comfortable, and responsive and that offer door-to-door service and longer service hours.

Accessibility for Low-Income Populations

In 2001, Virginia had the ninth lowest poverty rate in the nation, with just eight percent of Virginians living on income levels at or below the poverty level. In the past decade, the poverty rate in Virginia has fallen as economic opportunities have reached more of the poorest citizens of the Commonwealth.

The federal Personal Responsibility and Work Opportunity Reconciliation Act limits the time a person can receive welfare benefits and requires recipients to participate in job and training activities. For many of these people, access to transportation is the key to making a transition from welfare to work. Public transit helps connect lower income populations to employment. Through the Job Access and Reverse Commute Program, FTA provides grants to state and local governments and non-profit organizations representing welfare recipients, low-income individuals, and other disadvantaged groups to create new and expanded transit services. The services are intended to move people from their homes to employment sites and other employment-related services, such as childcare or job training. Grants also support services that provide access to suburban employment sites.

Accessibility for the Disabled

Currently, nearly 17 percent of the state's population is classified by the U.S. Census Bureau as having a disability. People with disabilities have traditionally had difficulty making full use of the transportation system to get to work, travel on business, visit friends and relatives, or take vacations. Obstacles in the system have prevented these individuals from participating fully in activities others take for granted. Considering the growing aging population, and the correlation between age and disability, the percentage of disabled Virginians is likely to increase dramatically in the future. It is vitally important to put in place today policies, designs, and technologies that ensure access for all.

The existing transportation system does not supply all of the services the elderly and disabled require. For example, many localities lack programs for individuals who are no longer able to drive and need assistance getting to and from vehicles and their homes and destinations. Accommodating disabled individuals benefits more than just people with disabilities. Ensuring a wheelchair user's access to curb ramps also helps an able-bodied parent pushing a stroller or a senior citizen wheeling a cart of groceries. Supplementing signage with auditory cues at crosswalks also helps those who are temporarily distracted or forgetful.

Transportation is vital in maintaining independence and mobility for people with disabilities, linking them to employment, health care, and participation in the community. At the federal level, the New Freedom Initiative seeks to create a more accessible public transportation

system for individuals with disabilities. FTA Capital, Formula, Planning and Research, and Job Access and Reverse Commute grants help local transit operators meet the requirements of ADA.

The Virginia Board for People with Disabilities reports that one of the most often-cited challenges for people with disabilities in achieving full participation in community life, particularly in employment, is the availability and reliability of transportation. More than 40 public transportation operators exist in the Commonwealth, but most are in communities with high population concentrations. In addition, there is a variety of services provided through private transportation providers, usually at great expense, and transportation services tied to the use of a specific federal or state program with its own set of rules.

Strategies to Address Accessibility and Mobility for Special Needs Populations
• *Increase transportation choices for special needs populations.* • *Consider special needs populations in the planning, design, and construction of transportation facilities and services.*

Natural and Human Environment

Today, nearly one-third of the energy consumed in the U.S. is for transportation. This massive consumption affects air, noise, and water pollution levels. In the past, transportation decisions were made with little consideration of the environmental impacts. Roads and airports were built through wetlands, parks, neighborhoods, and other environmentally sensitive areas. Public transportation services were allowed to decline. As a result of the National Environmental Policy Act of 1969, Clean Air Act, Clean Water Act, and a better-informed and involved public, environmental considerations and community impacts are now an important part of transportation decisions. In fact, transportation projects are expected to include restoration and even improvement of the environment and support community needs.

Air Quality

Transportation systems contribute to air quality problems, usually in the form of ground level ozone, nitrogen oxide, and carbon monoxide from mobile sources. Federal, state, and local regulations are in place to reduce mobile-source emissions. Through the federal Clean Air Act amendments and state implementation plans, strategies are continually being developed and implemented to reduce emissions. Vehicle emissions inspections, analysis of the air quality impacts of transportation plans, programs, and projects (i.e., transportation conformity), and the pursuit of advanced emission control technologies are now routine activities.

As shown in Figure 18, Virginia currently has five areas that do not meet federal air quality standards, called nonattainment areas. There is also one maintenance area – an area that was formerly out of compliance, but has since re-attained the air quality standards and must demonstrate continued compliance. Recently, EPA revised the national ambient air quality standards (NAAQS) for fine particulate matter (PM2.5). Based on these new standards, the

Northern Virginia portion of the Washington D.C. area will be designated as a PM2.5 nonattainment area.

FIGURE 18. NONATTAINMENT AND MAINTENANCE AREAS IN VIRGINIA

Nonattainment or Maintenance Area	Jurisdictions Included
Northern Virginia Ozone Nonattainment Area	Alexandria City Arlington County Fairfax City Fairfax County Falls Church City Loudoun County Manassas City Manassas Park City Prince William County
Richmond Ozone Nonattainment Area	Charles City County Chesterfield County Colonial Heights City Hanover County Henrico County Hopewell City Petersburg City Prince George County Richmond City
Hampton Roads Ozone Nonattainment Area	Chesapeake City Gloucester County Hampton City Isle of Wight County James City County Newport News City Norfolk City Poquoson City Portsmouth City Suffolk City Virginia Beach City Williamsburg City York County
Fredericksburg Ozone Nonattainment Area	Fredericksburg City Spotsylvania County Stafford County
Shenandoah National Park Ozone Nonattainment Area	Madison County (partial) Page County (partial)
Northern Virginia Carbon Monoxide Maintenance Area	Alexandria City Arlington County

Nonattainment or Maintenance Area	Jurisdictions Included
Areas Expected to Be Designated in December 2004 as Nonattainment Areas	
Northern Virginia PM2.5	Alexandria City Arlington County Fairfax City Fairfax County Falls Church City Loudoun County Manassas City Manassas Park City Prince William County

The Congestion Mitigation Air Quality Program (CMAQ) was created to fund projects that improve air quality and reduce congestion. CMAQ funds are allocated by a formula based, in part, on the severity of nonattainment and can only be used for projects that demonstrate an air quality benefit in a nonattainment or maintenance area. In 2003, CMAQ projects yielded an estimated three tons per day reduction in volatile organic compounds (VOCs) and 3.8 tons per day in nitrogen oxides (NOx), the two main components of smog.

Water Quality

From dredging in ports to construction across wetlands, transportation operations affect water quality. Federal, state, and local regulations require that the transportation community do its fair share in protecting and improving water resources. Programs to reduce sedimentation in streams from dirt and gravel roads, highway designs to eliminate and purify runoff, and the avoidance or restoration of wetlands are now part of doing business.

To assist in efforts to improve water quality in the Chesapeake Bay watershed, VPA has implemented several innovative improvements to treat stormwater runoff. VPA has constructed a 2-acre forested riparian buffer, a 1.5-acre oyster reef, a 7-acre stormwater basin with a 1.5-acre wetland bench, and an under-wharf stormwater detention basin at its marine terminals. In addition, several pre-manufactured stormwater treatment devices capable of handling large stormwater volumes are in use at many of VPA's facilities. These measures alone treat stormwater runoff from more than 250 acres of impervious surface at VPA's facilities.

Habitat Preservation

Another environmental and transportation issue is the rapid consumption of open land and the consequent loss of sensitive and diverse habitats. Transportation infrastructure can fragment wildlife habitats, or eliminate them all together. Avoiding impacts to habitats that support threatened and endangered species presents another challenge for Virginia's transportation system.

Virginia is losing farmland to commercial development at a rate of 45,000 acres per year.

Virginia is committed to maintaining habitat and watershed quality and connectivity:

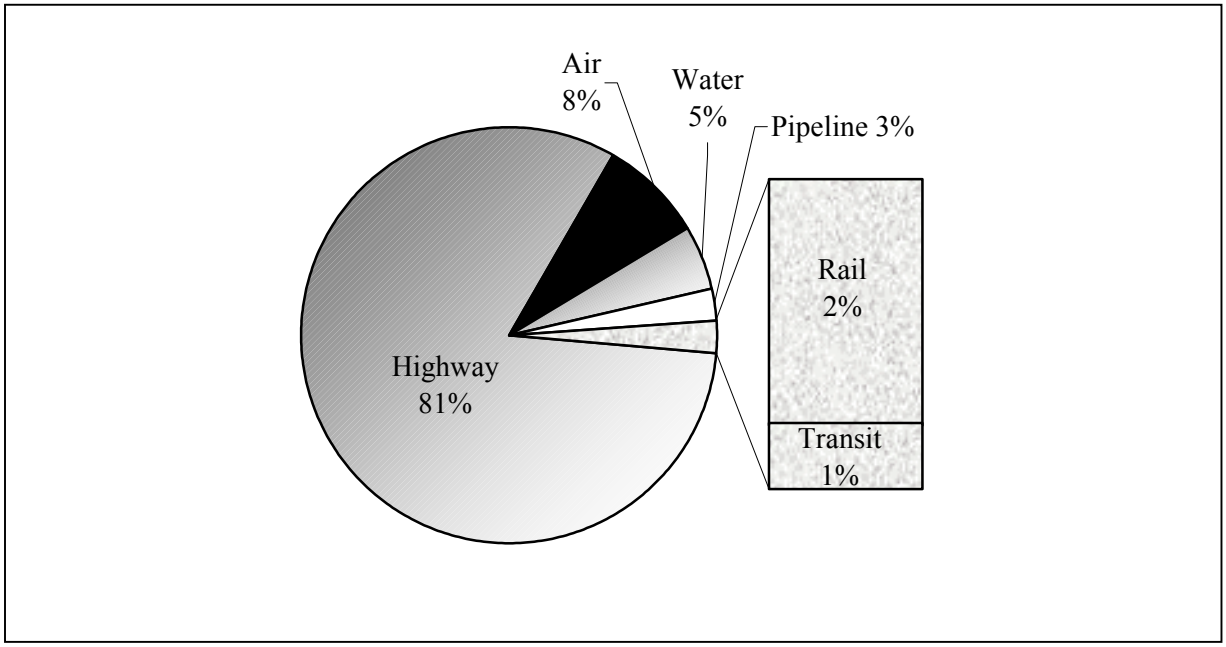
- Through placement of nesting boxes on bridges maintained by VDOT, endangered peregrine falcons – considered the world's fastest birds – once again fly high over Virginia's eastern seaboard. Because of the significant role it played in the recovery of the peregrine falcon in Virginia, VDOT earned the 1998 FHWA Excellence Award in the category of Environment Protection and Enhancements.

- As part of a mitigation package for improvements to 12 miles of Route 17 in Chesapeake, VDOT donated 758 acres of Great Dismal Swamp forested wetlands to the State Department of Game and Inland Fisheries. VDOT also plans to build designated black-bear underpasses (deer, raccoons, opossums, and foxes will use them too) to reduce wildlife habitat fragmentation.

Energy Use

The rate of U.S. energy consumption reflects underlying economic trends, and is a key environmental and national security concern. Transportation accounts for approximately 31 percent of the energy used in Virginia, and 64 percent of this is used as gasoline. As shown in Figure 19, transportation on highways accounts for more than 80 percent of energy consumption. Gasoline consumption continues to rise despite the remarkable advances in vehicle fuel efficiency.

FIGURE 19. ENERGY CONSUMPTION BY MODE



Use of alternative modes (e.g., transit, carpools, walking) reduces energy consumption and also improves other environmental factors as well. Cleaner burning fuels and alternatives to gasoline-powered vehicles also reduce energy consumption. Fuel cells, electrochemical devices that convert energy into electricity and heat without combustion, have a wide range of potential applications, including uses in bicycles, cars, trucks, buses, ships, and trains. Fuel cells do not emit pollution and use hydrogen as an energy source.

As less fossil fuel is used in the transportation arena, fuel tax revenues will decrease. Alternative sources of funding will need to be found to replace those from the fuel tax.

Cultural and Historic Resource Preservation

Virginia's transportation system, including its network of more than 2,000 highway historic markers, is the backbone of its historic tourism industry and provides access to the historic sites that draw visitors from around the world. Historic tourism creates jobs and economic opportunities, which in turn promote historic preservation and the protection of community character. Development, maintenance, and enhancement of a safe, efficient, and comprehensive transportation system is the best way to protect and promote Virginia's heritage.

The Brook Run archaeological site was first discovered while conducting a routine cultural resource study for the expansion of Route 3 in Culpeper County. Dating back to over 11,000 years ago, the site was once an ancient quarry where Virginia's earliest settlers extracted large rocks of jasper that were later fashioned into spear points, knives and other tools. Given the importance of this site, VDOT adjusted its highway improvement plans.

The Commonwealth's transportation agencies have a superior record of compliance with state and federal requirements. The Commonwealth's transportation program directly benefits historic preservation in Virginia. Since 1992 the CTB has awarded more than $58 million in transportation enhancement funds to more than 250 transportation-related historic preservation projects across Virginia. These projects have ranged from the rehabilitation of historic railway stations and bridges to streetscape improvements in historic areas and public interpretation of historic sites. The CTB's administration of the federal Transportation Enhancement Program is one of the most definitive illustrations of the meaningful and positive relationship between the Commonwealth's transportation and historic preservation interests.

State Environmental Review Process

In Virginia, transportation planners partner with more than two-dozen state and federal agencies to facilitate compliance with more than 60 different laws and regulations. To ensure that all applicable environmental regulations are considered in the highway planning and construction process, VDOT has instituted a State Environmental Review Process (SERP).

SERP provides the basis for a balanced consideration of environmental and transportation needs for VDOT projects. State environmental resource agencies are provided the opportunity to comment and provide environmental resource information at the earliest possible stage in project development. The information from the agencies is used to inventory environmental resources and minimize impacts during the project development process.

SERP was developed in response to a bill passed by the General Assembly that required the Secretary of Transportation and the Secretary of Natural Resources to jointly establish procedures for the review of highway and road construction projects. The process is documented in a Memorandum of Agreement between the two secretaries. Twelve state environmental resource agencies, along with VDOT, participate in the SERP.

Each year, VDOT plants approximately 2,500 pounds of wildflower seed that contribute to the environment by providing a source of nourishment for songbirds and beneficial insects. Wildflowers along our highways also reduce accidents and litter and help fight "highway hypnosis."

Quality of Life

The purpose of the transportation system is to link regions and serve communities by moving people and goods throughout the state. Transportation is an integral part of a community and the transportation system must be designed to function as an asset to the community. Public involvement is crucial to ensure that community needs are served by state investments in transportation.

Context-sensitive highway design considers the environmental, scenic, aesthetic, historic, community, and preservation impacts of highway projects, as well as access for other modes of transportation, such as bicycling and walking. Dispersed, low-density development reduces the feasibility of bicycling and walking. As the distances between origins and destinations increase, bicycling and walking become less comfortable. Traffic calming can provide benefits for bicycling and walking, such as reducing motor vehicle speeds, reducing the number of motor vehicles on streets, and better defining operating space. Treatments for traffic calming that can increase safety for pedestrians include curb extensions, raised pedestrian crossings and intersections, and crossing islands. Some treatments, such as narrowed lanes and devices that change the surface level, can create unsafe and uncomfortable conditions for bicyclists.

The Ballston community in Arlington County used public-private partnerships to create a street-oriented, urban environment that focused on an existing Metrorail Station. Located within ten miles of D.C., the joint venture provided more than 700,000 square feet of office, retail, hotel, and residential space adjacent to bus and rail transit facilities. A public plaza was incorporated into the design, and many key development and zoning issues were negotiated to provide for an attractive mix of land and pedestrian uses, buildings, and height allowances.

Transit-oriented design is a general description implying higher density land uses and activities designed and located to encourage ridership on public transit. Transit-oriented design projects attempt to attract people to the transit system by creating an atmosphere that is safe, convenient, and easily accessible by foot, bicycle, or an alternative transit mode. If people can safely walk to the transit stop and bank, buy groceries, and return library books on their way home from the station, they are more likely to use the transit system. It is essential to integrate transit stations into other activities of the community to maximize the benefits of the transit investment and ridership.

Strategies to Address the Natural and Human Environment

- *Increase involvement and collaboration with resource agencies (e.g., Department of Conservation and Recreation, Department of Environmental Quality, etc.).*
- *Proactively seek opportunities to exceed environmental requirements and employ state-of-the practice techniques.*
- *Seek out opportunities to link planning and environmental processes to streamline project delivery.*
- *Balance state and local needs in the development and implementation of multimodal transportation projects.*
- *Consider community impacts in the planning, design, and construction of transportation facilities and services.*

Technology

Virginia has long been a leader in the field of transportation technology. The Smart Road that links Blacksburg to Interstate 81 provides a test bed for new technologies, the magnetic levitation (MAGLEV) rail demonstration project at Old Dominion University, and Virginia's Small Aircraft Transportation System (SATS) Lab aimed at developing air travel between cities are all examples of Virginia taking the lead in developing and implementing new and innovative transportation technologies.

Electronic toll collection increases capacity by 200 to 300% compared to attended lanes.

Transportation technologies can improve the safety of existing systems and increase the effective capacity of existing infrastructure when used to monitor transportation networks, provide travel information, control and enhance traffic signal systems, prevent vehicle crashes, and reduce system demand. Technology can also eliminate the need for some trips and make travel time during necessary trips more productive.

Monitoring the Transportation Network Through Technology

Network monitoring technologies provide a means of directly observing the operation of the transportation system to identify crashes and traffic delay. They have become integral components of transportation systems because of their ability to improve the safety, security, and operational efficiency of current systems. A transportation system's ability to operate efficiently in both routine and extraordinary conditions can be enhanced using ITS. Information can be relayed to system operators to facilitate dissipation of congestion during peak travel times or following crashes and other non-routine events. Collected monitoring data can also be used to facilitate transit and freight route optimization, reduce the number of crashes, improve security, and adjust traffic signals to clear the way for emergency response vehicles.

Incident management programs can reduce delay associated with congestion caused by traffic incidents by 10 to 45 percent.

To improve the state's transportation network monitoring capabilities, VDOT operates Smart Traffic Centers in Hampton Roads, Richmond, and Northern Virginia. In the next five years, STCs will also open in Salem, Bristol, and Staunton. These centers operate 24 hours a day, seven days a week, and staff work with VDOT, the Virginia State Police (VSP), and other emergency responders to verify, clear, and inform motorists of highway incidents. STCs operate permanent and portable variable message sign boards, highway advisory radio sites, and closed circuit video cameras. An Emergency Operations Center has also been opened in Richmond to coordinate major accidents, weather emergencies, and transportation security. This center coordinates with VDOT field offices, state and local agencies, and FHWA. The center answers toll-free calls from the traveling public and provides information about road conditions.

Using Technology to Provide Information to Travelers

In addition to providing information on highway conditions, travel information systems assist the traveler and the commercial carrier in making good travel choices. They include traveler information web sites and phone lines, and onboard vehicle navigation systems. ITS can enable the public transportation user to anticipate when the next bus will arrive, the shipper to meet just-in-time delivery requirements, and emergency officials identify evacuation and/or alternate routes. Information can be conveyed to travelers and commercial carriers regarding work zones, congestion, weather conditions, and other potential hazards both before and during a trip to influence decisions about when to start, what route to take, and which mode to use.

Freeway management systems can reduce crashes while handling more traffic at higher speeds.

Virginia's 511 service is a public-private partnership to provide details about current traffic conditions and information about nearby lodging and restaurants to motorists. The service currently covers approximately one-third of the state, primarily along the Interstate 81 corridor. The system operates on a 24-hour basis and uses data from VDOT's real-time databases and the VSP computer-aided dispatch system. The 511 service is closely linked to variable message signs along the corridor that promote the service and convey travel information.

Virginia's advanced aviation weather information systems provide valuable data to pilots. Currently, there are 23 Virginia-based WeatherMation computerized weather-briefing terminals in place at airports throughout the Commonwealth. Pilots can access all necessary weather products from these terminals on and off site. Additionally, Automated Surface Observation Systems (ASOS) and Automated Weather Observation Systems (AWOS) measure existing airport weather conditions and provide this information to pilots via aircraft radio, telephone, and, in some cases, through satellite uplink. Currently, there are 28 Virginia-based AWOS III units. Nine ASOS units are currently in service in the Commonwealth.

Improving Traffic Signal Systems with Technology

ITS can be used to control and enhance traffic signal systems. Signals can be actualized, synchronized, and optimized to facilitate movement of vehicles along a corridor. Similarly, signal systems can be enhanced to create unimpeded paths for emergency, public transportation, and other vehicles, significantly improving intersection safety, reducing response time, and improving the reliability and speed of priority vehicles. Many technological improvements, such as in-pavement lighting on crosswalks, count-down signals, illuminated push buttons, and infrared and microwave detectors, can also improve intersection safety for pedestrians and bicyclists. Advanced signal systems can also be used to control access to components of the system (e.g., ramp metering), such as HOV lanes or congested interstate facilities. Conversely, traffic control systems can be used to stop or divert traffic by warning drivers of approaching trains, drawbridge openings, and other events.

Using Technology to Impact Demand

In addition to improving overall operating efficiency of the transportation system, ITS can be used to help manage or reduce transportation demand. Potential ridesharers can be matched to promote carpooling, thereby reducing highway traffic volumes. Travel information systems, such as real-time traffic and transit schedule reports, can influence decisions about whether to make a trip, when to start, and which mode to use.

Technology can eliminate the need for some trips and make travel time during trips that are necessary more productive. Telecommuting, also called teleworking, is performing work away from the primary office, permitting some employees to avoid commuting altogether. When travel is necessary, accommodations for phones and computers on public transportation systems can make that travel time more productive. Providing conduits for fiber optic cables, or other state-of-the-art technologies during the construction of new infrastructure will help facilitate the movement not only of people and goods but also information. In addition to transportation benefits, providing such technology infrastructure results in workforce and economic benefits.

DRPT plans to launch a statewide web-based commuter-matching database connecting all of the state's commuter assistance agencies. It is envisioned that commuter agencies and commuters alike will be able to log on, fill out an application, and receive information on potential rideshare partners instantly. Links will be provided to all commuter agencies and transit providers in the state.

For more information on travel demand management, see the Congestion subsection in Chapter 4.

Following optimization of the signal system in Tysons Corner, Virginia, annual savings to motorists traveling the network were estimated at near $20 million. Reductions included vehicle stops by 6 percent (saving $418,000), system delay by 2 percent (saving $18 million), and fuel consumption by 9 percent (saving $1.5 million). Estimated reductions in total annual emissions for carbon monoxide, NOx, and VOCs were approximately 134,600 kilograms. Statewide, in 2003, CMAQ funds were used for traffic flow improvement projects such as coordinated signal systems that reduced emissions of VOCs by 1.7 tons per day.

Technology and the Future Transportation System

FHWA reports that investing in metropolitan ITS infrastructure will yield an $8 benefit for every $1 invested. Benefits can range from measurable congestion reduction and reduced crash rates to better relationships among service providers and a stronger national economy through increased mobility and new markets for products and services. In addition, ITS promotes environmental stewardship by making public transportation systems more attractive and improving traffic flow, thereby reducing harmful emissions.

Just as newer and more complex technologies will continue to drive the development of products and services, so will they influence the development of the transportation system. The impact of the Internet and more reliable telecommunication systems has already altered the way in which many people fulfill their daily obligations. As technology advances, the challenge to transportation planners will be to stay current with the changes and look to the opportunities afforded by technology.

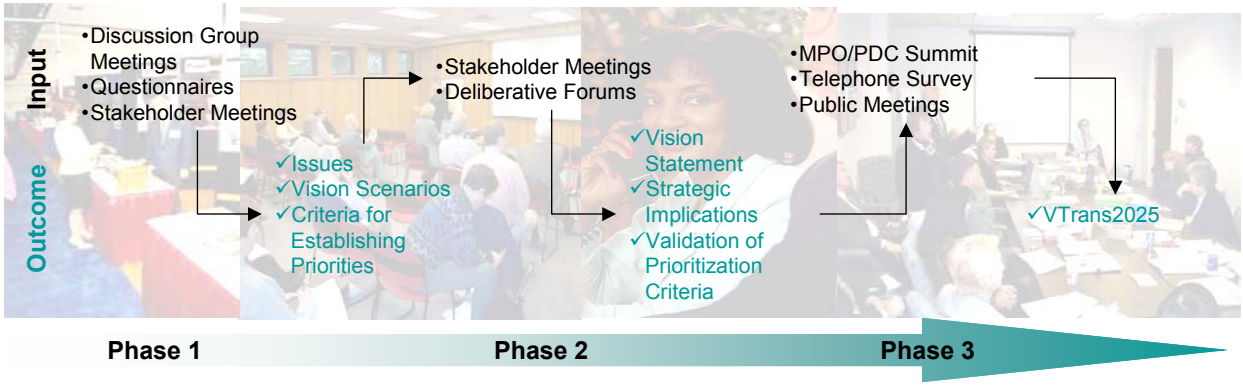
Strategies to Address Technology

- *Bundle technologies with capacity improvements.*
- *Proactively consider technological improvements to address transportation issues.*
- *Support research on new technologies and invest in innovation.*

CHAPTER 5. PUBLIC AND STAKEHOLDER PERSPECTIVES

Although *VTrans2025* is a product of research, data collection and analysis, and extensive discussion among experts, it is also a result of listening to the public and other stakeholders through an extensive outreach process. Thousands of Virginians provided input for *VTrans2025* either by attending one of more than 40 meetings held across the state or by completing a telephone survey. Their considerable contributions have resulted in this multimodal long-range transportation plan. It reflects the vision and priorities of the public and other transportation stakeholders. Figure 20 illustrates the major outreach activities and outcomes of these efforts. *VTrans2025* provided a forum for making decisions about statewide transportation policy that accounted for the needs and expectations of transportation users and communities across the Commonwealth. Highlights of the outreach efforts are provided here; see Appendix B for a detailed description of the entire outreach effort.

FIGURE 20. MAJOR OUTREACH ACTIVITIES AND OUTCOMES



Phase 1 Outreach Efforts

Phase 1 outreach activities centered on gathering information on what should be in the plan, identifying what people see as a vision for transportation in Virginia, and identifying long-range goals. A three-pronged approach was initiated to obtain this input primarily through a series of discussion group meetings, informal questionnaires, and stakeholder group meetings. Major issues identified included the need for more coordinated multimodal planning, more transportation alternatives in both urban and rural areas, more coordination among the transportation agencies, and more coordination between transportation and land use. Based on this input, draft vision, goals, and objectives were formulated. In addition, input during Phase 1 activities was used during Phase 2 to develop a series of long-range vision scenarios for transportation in the Commonwealth.

Phase 2 Outreach Efforts

Phase 2 efforts built upon the Phase 1 activities and centered on development of a long-range vision for transportation in Virginia and validation of the goals and objectives defined in Phase 1. Using the input gathered during Phase 1, several long-range visions for transportation in Virginia were developed and presented to stakeholders for feedback. Input was sought primarily through a series of stakeholder meetings and deliberative forums. Several key problems facing passenger and freight transportation were identified, including traffic congestion, poor connectivity, inadequate travel choices, poor access to services, poor access to jobs, and inadequate investment of resources in transportation.

Phase 3 Outreach Efforts

Whereas Phase 1 and Phase 2 efforts largely focused on gathering stakeholder and public input, Phase 3 efforts primarily involved processing that input and providing feedback to participants. Outreach to the general public was in the form of public meetings. Additionally, a statewide telephone survey was used to determine the representativeness of the values and opinions identified in public meetings. Coordination with PDCs, MPOs, and local elected officials were key components of Phase 3 activities.

Perspectives

Although the deliberative forums and stakeholder meetings were conducted using different formats and a somewhat different focus, the perspectives of participants tended to converge on major issues. In general, participants agreed that change is needed. Stakeholders expressed belief that Virginia has a stovepipe planning process and inflexible funding programs, which do not necessarily support a true multimodal transportation system. Participants felt that transportation planning and decision-making needed to be more collaborative and more responsive to regional needs. They expressed a desire for greater emphasis on regionalism in planning along with consistent, assured attention to regional priorities as distinct from state priorities. There was also near unanimous support for increasing investment in transportation if investments were better balanced among modes and if revenues raised for transportation were protected for transportation investment.

As would be expected, there was variation between urban and rural areas with respect to the relative importance of the six *VTrans2025* goals. Whereas participants from smaller areas expressed more interest in transportation that supports economic competitiveness, participants from larger areas showed stronger support for actions that enhance intermodalism and mobility.

During the stakeholder meetings, the most frequently mentioned issues in state transportation policy included:

- Improved communications among state agencies, regional agencies, and local officials, including stronger educational efforts and increased citizen involvement.
- Increased local responsibility, authority, and involvement in transportation decision-making.
- Increased linkage between land use and transportation decision-making.
- Focus on strategic interests as the basis for state policies, programs, and decisions.
- Institutional change that can better coordinate modal planning and investments and focus a strong long-range planning role within the transportation secretariat.
- Increased spending not subject to diversion at the legislative or departmental level, including greater emphasis on alternative modes.

Although stakeholder-meeting participants ranked intermodalism and connectivity highest among various transportation values, survey respondents would not trade off enhanced safety, quality of life, or environmental protection for increased mobility. On average, Virginians rank the six *VTrans2025* goals roughly equal. Transportation needs varied across regions, with a stronger focus on non-highway modes in metropolitan areas and a stronger focus on roads in smaller communities. Overall, the survey shows that Virginians value the transportation choices they currently have but do not rate their performance highly. Virginians support paying higher taxes for transportation improvements if they have assurances that funding is going to transportation improvements and that those improvements are completed within budget.

Survey findings showed the following:

- Road congestion and safety are top concerns.
- Transportation projects that result in reduced safety are not acceptable tradeoffs for system efficiency, mobility, economic competitiveness, or any other concern.
- Virginians do not want to sacrifice the environment for transportation improvements.
- Virginians want more transportation alternatives.
- In large urban areas, there is a strong focus on non-highway alternatives.
- In rural areas, road improvements are more important than enhancing other modes.

CHAPTER 6. STATEWIDE VISION, GOALS, AND OBJECTIVES

Virginia's transportation system must continue to adapt to the demands placed upon it and continue to reflect the varied needs of Virginia's diverse communities and regions. Opinions on the transportation system of the future are at times as diverse as its communities. On many points, however, there is near unanimity. The vision, goals, and objectives identified in this chapter reflect the general consensus and common themes expressed throughout the outreach process.

The Vision of Transportation in Virginia

Most of us share a common "vision" of what we want the future to be like—peace, prosperity, opportunity, comfort, security, etc. Much of our shared vision assumes we are able to move throughout our communities, our regions, the state, and the nation. Yet, travel on Virginia's transportation network is becoming an ever more difficult, time-consuming, and dangerous chore for many residents and visitors. Planning and investment in transportation have supported steady economic growth and a high quality of life, but these advantages are threatened as increasing travel demand outstrips capacity on the current network and as available transportation choices to meet changing needs remain limited. On a daily basis, more and more Virginians encounter a transportation network under severe strain.

The following vision statement evolved from careful consideration of the entire body of stakeholder and public input. It reflects the priorities and values held by the public and other transportation stakeholders.

Virginians envision a multimodal transportation system that is safe, strategic, and seamless, where:

- Travel for people and goods is safe and uninterrupted.
- Transportation improvements protect the environment and the quality of life in Virginia's communities while enhancing economic opportunity.
- Transportation improvements respect and reflect the varied needs of Virginia's diverse communities and regions.
- Investments in transportation are adequate to meet current and future needs.
- Transportation decisions are guided by sustained, informed involvement of Virginia's community leaders and citizens.
- Full accountability and enduring trust is the hallmark of transportation planning and investment decisions throughout the Commonwealth.

Statewide Goals and Objectives

The input received throughout the long-range planning effort was also used to identify six long-range goals and objectives for the multimodal transportation system. The statewide goals are summarized in Figure 21. These goals are intended to guide transportation decision-making and form the basis for an objective multimodal prioritization system, as discussed in Chapter 7.

FIGURE 21. SUMMARY OF STATEWIDE GOALS

Goal 1	Safety and Security
Goal 2	Preservation and Management
Goal 3	Mobility, Accessibility, and Connectivity
Goal 4	Economic Vitality
Goal 5	Quality of Life and Environmental Stewardship
Goal 6	Fiscal Responsibility

GOAL 1. SAFETY AND SECURITY

Provide a safe, secure, and integrated transportation system that reflects the diverse needs throughout the Commonwealth.

Objectives:

- Improve safety for system users and operators within the system and at mode origins/destinations (e.g., improve at-grade crossing safety, improve bicycle and pedestrian safety, correct sub-standard safety designs and other geometric/pathway deficiencies, such as runway obstructions, channel depth, and bridge clearance).
- Increase the security of the transportation system and its users.
- Provide infrastructure, facilities, and communications to meet strategic and emergency transportation needs.

The *VTrans2025* survey found that traveling safely is the public's highest expectation of the transportation system and safety remains a top priority for the Commonwealth's transportation agencies. This goal aims to ensure that the transportation system provides the safest possible roads, buses, trains, and airports and that travelers and commuters are safe and secure while using the system. The port, rail, and highway networks that carry freight must also be secure from the threats and function in emergencies.

GOAL 2. PRESERVATION AND MANAGEMENT

Preserve and manage the existing transportation system through technology and more efficient operations.

Objectives:

- Preserve transportation infrastructure to achieve the lowest lifecycle costs (most efficient maintenance cost) and prevent failure.
- Encourage access management techniques that preserve the operational integrity of existing infrastructure while ensuring appropriate access to adjacent land uses.
- Maximize system utilization by increasing the efficiency of existing facilities and services through use of technology and demand management techniques.
- Maintain the effective and predictable operation of the transportation system to meet customers' expectations by using technology and demand management techniques.
- Reduce transfer time between modes.

Virginia's citizens have made a large investment in creating a statewide transportation system of highways, transit, railroads, airports, bike paths, marine terminals, and other facilities. The effects of sustained growth are exceeding the capacity of the existing system, hindering our ability to keep the transportation system operating effectively, efficiently, and predictably for Virginia's citizens. While services and capacity need to be added, it is critical that the day-to-day workings of existing services continue. System preservation protects initial transportation investments by keeping facilities in sound condition. This goal aims to ensure that priority is given to operating and preserving the transportation system even though the system is strained by increasing demand.

GOAL 3. MOBILITY, ACCESSIBILITY, AND CONNECTIVITY

Facilitate the efficient movement of people and goods, expand travel choices, and improve interconnectivity of all transportation modes.

Objectives:

- Reduce congestion for all modes.
- Ensure seamless connections between modes by providing networks of facilities that facilitate the journey from origin to destination and all connections between.
- Increase capacity for the movement of people and goods.

- Improve access to major activity centers.
- Meet basic transportation needs for special needs populations (e.g., the elderly, lower socioeconomic groups, and the disabled).
- Expand modal choices.

Providing for Virginia's future will require a more efficient transportation system that reduces congestion, provides travel options, and connects transportation services. This goal aims to provide viable transportation choices and ensure that the transportation system works as a single, interconnected system that allows people and goods to easily transfer from one mode to another. In addition, this goal aims to provide all citizens transportation access to basic services such as jobs, childcare, health care, shopping, and other goods and services.

GOAL 4. ECONOMIC VITALITY

Improve Virginia's economic vitality and facilitate the coordination of transportation, land use, and economic development planning activities.

Objectives:

- Improve accessibility of the workforce to employment opportunities.
- Improve accessibility of goods to markets.
- Improve accessibility of people to goods and services (including recreation, tourism, cultural resources, and markets).
- Promote efficient use of current and future transportation facilities and services by coordinating transportation planning and implementation with local land use planning and economic development goals.

Citizens and businesses rely on the state's transportation system to receive goods and services, go to work, haul raw materials to factories and fields, and bring goods and produce to market. Economic growth initiatives must include transportation components as well as workforce development, technology investment, and other strategies. This goal focuses on fostering collaborative decision-making with regard to transportation and economic development. It also aims to ensure that all Virginians can make full use of the transportation system to get to work, travel for business, visit friends and relatives, or take vacations.

GOAL 5. QUALITY OF LIFE AND ENVIRONMENTAL STEWARDSHIP

Improve environmental quality and the quality of life for Virginians.

Objectives:

- Maintain and improve air quality by meeting applicable air quality standards.
- Maintain and improve water quality by meeting applicable water quality standards.
- Maintain habitat and watershed quality and connectivity.
- Preserve Virginia's rich cultural and historic resources.
- Ensure that transportation facilities and services are compatible with the communities and destinations they serve.

The purpose of the transportation system is to link regions and serve communities by moving people and goods throughout the state. This must not come, however, at the expense of the state's vast natural and cultural resources or diverse communities. The *VTrans2025* survey found that Virginians do not want to sacrifice the environment or quality of life for transportation improvements. This goal aims to ensure that the transportation system is designed and operated in a manner that enhances communities and protects Virginia's natural and cultural resources.

GOAL 6. FISCAL RESPONSIBILITY

Improve program delivery.

Objectives:

- Maximize use of non-state funds (e.g., federal, PPTA, tolls).
- Maximize the system benefit of investments.
- Minimize long-term maintenance costs (i.e., life-cycle cost).
- Leverage opportunities between modes.
- Coordinate completion/implementation schedules and funding of interdependent multimodal projects.

Improving program delivery at the planning level will require implementation of a performance-based system to aid in decision-making. Performance-based planning establishes objective criteria for all modes in order to measure and compare the merits of proposed projects and to make more informed investment decisions. Use of objective criteria for establishing priorities increases accountability and relates transportation investments to system performance. Particularly when resources are scarce, use of objective criteria to establish priorities ensures that

limited funds are spent on projects that will achieve the greatest system benefit. Such a system also makes the process more transparent and more easily communicated to the public. This goal is focused on addressing the challenge posed by increasing demand and decreasing resources by giving priority to projects that involve coordinated investments, leverage opportunities among modes, maximize the use of local and private funds, and reduce long-term maintenance costs.

CHAPTER 7. FRAMEWORK FOR SETTING PRIORITIES AND DECISION-MAKING

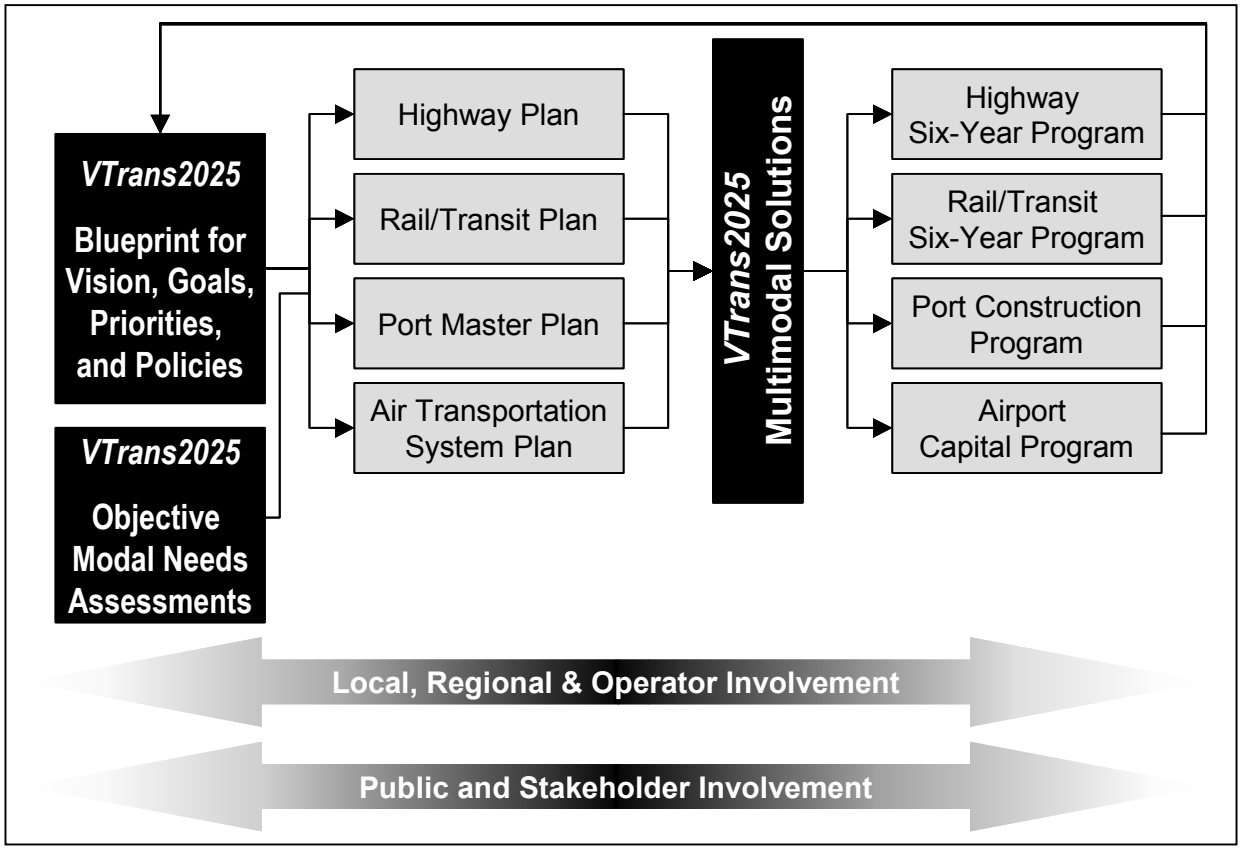
The multimodal investment network, or MIN, is introduced both as a concept and as a process. As a concept at the planning stage, it is a way to think about projects. MINs are *projects that depend on each other*, like a bus needs a road; *projects that connect two or more modes*, like a road connects to an airport; *projects that might be substitutable*, like a rail line in lieu of a road; or *projects that are multimodal by definition*, like HOV lanes. In all cases, these projects have more than one modal component – at least at the planning stage. While it is clear that cases where one mode connects with or relies on another are multimodal or intermodal, it is also critically important to identify opportunities where one mode might be a more effective solution than another while still in the planning stage.

As a process, planning around MINs provides a mechanism for ensuring that multimodal solutions are identified. The four transportation modal agencies identify opportunities for substitutability and intermodal needs. While one modal agency takes the lead in championing the MIN, all the agencies will be represented in the identification and evaluation of multimodal needs.

This is an important shift in current planning processes. The tendency now is to identify road or rail corridors, for example, not service needs. It represents a shift from focusing on individual modal capacity issues to focusing on the most efficient way to move people and goods throughout the state. In this way, long-range planning is more likely to result in a more integrated transportation system and more multimodal solutions.

Existing modal plans are not replaced; rather, this approach builds upon the strengths of existing planning processes. Each mode has its own unique characteristics, stakeholder relationships, funding mechanisms, and regulatory requirements. Most projects identified by the individual modes will continue to be single-mode. Priorities will continue to be set within existing modal plans. However, a separate evaluation process takes place for multimodal priorities. *VTrans2025* provides the blueprint for transportation planning in Virginia by defining the overall vision, goals, objectives, and performance measures. When the process identifies high priority multimodal solutions, in the form of MINs, they are given increased consideration over single-mode solutions in the appropriate modal plan. In this way, MINs link transportation planning at the agency level to a common vision and specific objectives covering the entire state, focusing investments and resources on projects that result in a truly multimodal transportation system that is more responsive to users. Figure 22 illustrates this relationship. The MIN process also addresses the need to more closely coordinate planning among the individual modes and to help Virginia "think differently" about transportation. Rather than taking a modal approach to mobility and accessibility, this approach focuses on transportation networks and the interdependence of the modes.

FIGURE 22. THE ROLE OF VTRANS2025 AND MINS



Setting Priorities

Both the Auditor of Public Accounts and the state legislation requiring *VTrans2025* call for the development of objective criteria for prioritizing projects. Use of objective criteria for establishing priorities increases accountability and relates transportation investments to system performance. It also makes the process more transparent and more easily communicated to the public. Particularly when resources are low, use of objective criteria to establish priorities ensures that limited funds are spent on projects that will achieve the greatest system benefit.

Through public outreach, goals were established for *VTrans2025*, as identified in Chapter 6. These goals served as the basis for objective, performance-based criteria used to rate the MINs; the degree to which projects meet these goals will ultimately influence funding priorities. This system will serve as a decision-support tool by providing a list of investment options for decision-makers that is based on objective performance-based criteria. In this way, the multimodal prioritization criteria ensure that decision-making at the state level reflects the diverse needs of Virginia's stakeholders and communities. A complete list of the multimodal performance objectives and measures can be found in Appendix C.

MINs are typically composed of projects from several modes. For example, the Interstate 81 Passenger and Goods Movement MIN is comprised of recommendations for capacity improvements along Interstate 81, freight and passenger rail capacity improvements, and a new community airport in Lexington/Rockbridge County. Because of their expansive size, cost, and scope, prioritizing individual MINs is infeasible. Instead, the components of each MIN (recommendations) will be prioritized. These priorities will provide direction for each transportation agency's planning and prioritization processes. An illustrative list of MINs is included in Appendix D.

Relationship Between MINs and Regional Plans

The MIN approach to planning is intended to foster multimodal planning at the regional and local levels. Regional planning bodies are encouraged to use a similar process in the development of their long-range transportation plans. MINs will be identified from existing modal plans, such as VDOT's *Statewide Highway Plan* or DRPT's *State Rail Plan*, as well as regional plans. This will be done by the modal agencies in consultation with MPO and PDC planners. Once identified, MINs will be evaluated based on objective criteria tied to the *VTrans2025* goals to provide information to decision-makers for investing limited transportation resources.

The identification and prioritization of MINs will establish statewide priorities that will ultimately rely on the individual transportation agencies and regional and local planning bodies to implement. For this reason, consistency and coordination between regional and statewide planning efforts is critical to the success of *VTrans2025* and realization of the vision for a safe, strategic, and seamless transportation system.

Further Development of MINs

While the MIN approach provides a useful framework for planning and prioritizing multimodal projects at the state level, its development is still underway. The process for formally identifying, evaluating, and prioritizing MINs is still being tested. Work on this important new direction for long-range transportation planning in Virginia will continue in partnership with local and regional planning partners.

Identifying multimodal performance measures and finding metrics that are comparable across modes is challenging. Similar data are not collected for each mode and metrics tend not to be equivalent. All states that employ performance measures have found the process to be an evolutionary one and *VTrans2025* performance measures will evolve over time. They continue to be reviewed and revised as circumstances change and more information and data become available.

The process by which MINs are identified and prioritized is conceptual at this point. The concept must be tested for feasibility and compatibility with existing planning and prioritization processes. For example, the role of the state's local and regional planning partners must be more clearly articulated. Consideration must be given to ensuring that MIN components enjoy a high priority within each modal agency's planning process. How much priority a MIN component would have in contrast to a high priority modal project has yet to be determined. The MIN process must be tested in upcoming modal planning and prioritization exercises and adjustments to the process must be made accordingly.

CHAPTER 8. SUMMARY OF MODAL NEEDS ASSESSMENTS

Needs analyses are used in transportation planning to objectively identify deficiencies and potential solutions. Each of the four modal agencies conducted a 20-year needs analysis using individualized methodologies. Because each agency has its own unique methodology and planning process, the individual needs analyses vary in terms of time horizons and use of inflated or constant dollars. Accordingly, the needs results from the individual modal agencies have been modified (e.g., final numbers are in inflated dollars) to facilitate comparisons. Furthermore, while the assessments represent the best estimates of future needs, utilization of the numbers is subject to the following caveats:

- The needs assessments in no way represent commitments to plan, fund, design, or build specific projects.
- The assessments reflect the total cost to resolve deficiencies and are not limited to the state's obligation.
- The assessments are unconstrained, do not reflect historical patterns in state transportation financing, and do not take into consideration the fiscal capacity of the state to fund the needs.
- The assessments sometimes overlap because the same need may have been identified in multiple modal needs assessments, particularly with respect to the highway and transit needs.

Summary of Highway Needs

Construction Needs

VDOT's *2025 Highway Needs Assessment* establishes a technical and objective method of identifying system-wide highway performance deficiencies (i.e., congestion), without regard to financial constraints, to assist policy-makers and decision-makers in determining future transportation funding needs and allocations. The results of the highway needs assessment also provide the documentation for a comparison of the relative highway needs for the state-maintained highway systems (i.e., interstate, primary, secondary, and urban systems) at the state level and the level of the VDOT construction districts.

The needs assessment comprises a quantitative and objective planning analysis designed to identify performance deficiencies (based on levels of service) on all existing federally funded highway facilities. LOS thresholds range from A to F and represent congestion thresholds for highway systems as established by the Transportation Research Board's Committee on Highway Capacity and Quality Service. The result is a purely objective highway solution that does not take into consideration physical space limitations or other reasons why a particular facility cannot be constructed.

The performance measures used to determine needs for the *2025 Highway Needs Assessment* were based on highway capacity thresholds as defined by LOS criteria. For the purposes of the *2025 Highway Needs Assessment,* facilities in rural areas operating below LOS C were considered deficient. Similarly, facilities in urban areas operating below LOS D were considered deficient. Peak hour LOS formed the basis for the analysis.

VDOT's Statewide Planning System (SPS) was used to perform the highway needs assessment. SPS is a model that uses inputs such as highway inventory information (e.g., pavement width, number of lanes, terrain type) and traffic data (e.g., historical traffic counts, traffic projections) to identify future highway system capacity deficiencies. SPS then systematically identifies possible highway solutions to the deficiencies (e.g., increasing pavement width, adding more lanes) to solve them. Next, SPS uses planning cost estimates to assign costs for the solutions.

The *2025 Highway Needs Assessment* is one component of VDOT's statewide planning process. The entire process is composed of three efforts—the highway needs assessment, the statewide highway plan, and the application of a highway prioritization methodology. These efforts are successive in order and build upon one another. Using the *2025 Highway Needs Assessment* as a foundation, the *2025 Statewide Highway Plan* takes into consideration existing corridor studies and regional transportation plan recommendations along with a comprehensive field review to develop feasible highway solutions to capacity deficiencies. The result is a list of recommended interstate and primary projects by district and for the state. *The 2025 Statewide Highway Plan* differs from the *2025 Highway Needs Assessment* in that the feasibility of highway solutions is taken into account. The Highway Prioritization Methodology is a concise set of goals, objectives, and measures to assist the CTB and VDOT in evaluating and prioritizing the proposed transportation improvements identified in the *2025 Statewide Highway Plan.*

Figure 23 shows the percent of statewide lane miles (a mile-long segment of a four-lane interstate would be the equivalent of four lane-miles) considered deficient in 2004 and in 2025.

FIGURE 23. PERCENT OF STATEWIDE LANE MILES CONSIDERED DEFICIENT

System	2004	2025
Interstate	29	79
Primary	32	49
Secondary	30	44
Urban	11	22

By 2025, at least 96 percent of the interstate system lane miles in five of VDOT's nine construction districts (i.e., Bristol, Fredericksburg, Lynchburg, Northern Virginia, and Salem) will be deficient.

Figure 24 provides information on the estimated needs or investment in 2002 dollars needed on existing highway systems to provide for acceptable performance levels. Adjusted for a three percent annual average inflation growth rate, the $56.1 billion total investment translates into $82.1 billion in inflation-adjusted dollars.

FIGURE 24. ESTIMATED INVESTMENT NEEDED ON HIGHWAY FACILITIES BY 2025 (BILLIONS OF 2002 DOLLARS)

System	Investment Needed (billions)
Interstate	$18.7
Primary	18.9
Secondary	14.0
Urban	4.5
Total	**$56.1**

For more information on estimated highway construction needs, see the entire report on the *2025 Highway Needs Assessment* prepared by VDOT.

Non-Construction Needs

As this report is finalized, VDOT is in the final stages of estimating maintenance and other non-construction needs. As such, non-construction related highway needs over the 2005-2025 period, estimated by extrapolating actual expenditures, are as follows:

- Maintenance is estimated to grow four percent per year, from $1.3 billion in 2005 to $2.7 billion in 2025, for a total need of over the 2005-2025 period of $38.8 billion.

- Administrative and overhead programs are estimated to grow 2.5 percent per year from $596.6 million in 2005 to $1.2 billion in 2025, for a total need over the 2005-2025 period of $18.9 billion.

- The cost of debt service, no new debt sales assumed, decreases over the period, from $246.2 million in 2005 to $21.7 million in 2025 for a total need over the 2005-2025 period of $3.5 billion.

With the heightened interest in security resulting from 9/11, VDOT has established a security division and is using current funds to finance certain initiatives. However, VDOT has identified $623 million in hazard mitigation initiatives for which no funding stream has been identified. The initiatives range from road and bridge improvements to new traffic centers.

In sum, the total non-construction highway needs over the 2005-2025 period are estimated at $63.8 billion (including the $623 million for security). Total construction and non-construction needs amount to $145.9 billion.

Summary of Bicycle and Pedestrian Needs

In response to guidance provided by the Secretary of Transportation to give non-motorized transportation the same consideration as motorized transportation in the planning, design, construction, and operation of Virginia's transportation network, VDOT developed a policy for integrating bicycle and pedestrian accommodations. This policy provides the framework through which VDOT will accommodate bicyclists and pedestrians, including pedestrians with disabilities, along with motorized transportation modes in the planning, funding, design, construction, operation, and maintenance of Virginia's transportation network to achieve a safe, effective, and balanced multimodal transportation system. The policy was adopted by the CTB in March 2004, and a *Statewide Bicycle and Pedestrian Plan* was developed to implement the policy. The plan is intended to establish a consistent approach to integrating the consideration of bicycling and walking accommodations into the transportation network. See the entire plan, including the *Policy for Integrating Bicycle and Pedestrian Accommodations* for more information.

There is no existing statewide inventory of bicycle and pedestrian accommodations. They are not defined uniformly; some are on state-owned right of way, others are not. As most bicycling and walking trips are local in nature, decision makers at the local level have the key role in identifying the needs for bicyclists and pedestrians traveling within their areas.

Summary of Aviation Needs

DOAV completed a 20-year capital needs analysis as an element of its *Virginia Air Transportation System Plan* (VATSP) update. Published in 2003, the VATSP update identifies a list of 20-year capital needs that will require funding by federal and/or state revenues.

The requirements for airports are driven not only by the volume of air transportation, but also by the means in which it is provided. Airlines are expected to continue concentrating their operations at busy transfer hubs, such as Washington Dulles International Airport, maximizing the opportunity to transfer passengers. Lower cost carriers are likely to increase their service to Virginia communities as well, when warranted by marketing considerations. Internationally, the globalization of Virginia's economy and the advancements in aircraft long-range capabilities will combine to bring more international passengers and potential jobs to the Commonwealth. The effects of unprecedented international and domestic growth will require Virginia's commercial service airports to add new runways, expand passenger terminal and parking facilities in addition to addressing growing air cargo industry requirements. The costs of these new capital improvements over the next 20 years are in excess of $5.5 billion.

Non-capital aviation needs (e.g., nonrecurring maintenance, promotion programs, etc.) of $113.1 million through 2025 were also identified. Included in the $113.1 million is $8 million for security at general aviation airports. DOAV has indicated that non-capital needs are sufficiently funded if the Department continues to be funded at current levels with aviation taxes and there are no changes in priorities and no diversion of aviation taxes. More detailed information on the aviation capital and non-capital needs is available in the VATSP update.

Summary of Port Needs

VPA's needs assessment is an element of its *2040 Master Plan*. Needs were identified based on a comparison of projected 4.1 percent growth in containerized and break-bulk cargo with the capacity of existing port facilities. Based on this anticipated growth, the following modernization and expansions are planned at a cost of $2.9 billion through 2040:

- Renovations to Norfolk International Terminal.
- Maintenance and renovations to Portsmouth Marine Terminal and Newport News Marine Terminal.
- Expansion to the Virginia Inland Port.
- Design, engineering and construction of the Craney Island Marine Terminal.
- 55-foot Channel Dredging.

Recalibrated through 2025, VPA's capital needs are estimated at $1.9 billion. VPA has also identified $39.2 million in security needs and ongoing costs of $7.7 million to secure the ports. More detailed information on the port needs analysis is available in VPA's *2040 Master Plan.*

Summary of Public Transportation, Rail, and Travel Demand Management Needs

DRPT's *Public Transportation, Rail, and Travel Demand Management Needs Assessment* is based on an examination of both the current status of rail and public transportation in the Commonwealth and an evaluation of anticipated changes through 2025. Different from the needs assessments of the other modal agencies, DRPT's needs assessment outlines a series of alternative investment strategies through 2025 that build on the existing rail and transit network. The needs estimates are based on three different assumptions regarding the role of rail and public transportation across the Commonwealth over the next 20 years. The three alternative scenarios follow:

- **Scenario 1** – Status Quo (Loss of Market Share). This scenario assumes a continuation of the current approach to funding and service levels across the state, which will have the effect of reducing market share.
- **Scenario 2** – Strategic Investment (Maintain Market Share). This scenario assumes improvements to existing services across the state.
- **Scenario 3** – Fully Integrated System (Increase Market Share). This scenario aggressively expands and improves rail, public transportation, and travel demand management services across the state.

The general characteristics of each scenario in terms of ridership, condition of assets, and service area coverage are summarized in Figure 25.

FIGURE 25. SUMMARY OF THE THREE SCENARIOS

Scenario	Ridership	Condition of Assets	Service Area Coverage
Scenario 1 – Status Quo (Loss of Market Share)	Ridership growth matches Virginia's population growth rate of 1.1%/year	Systems struggle to maintain the condition of their assets	Coverage will remain comparable to that found today; limited expansion
Scenario 2 – Strategic Investment (Maintain Market Share)	Ridership growth matches Virginia vehicle-miles of travel (VMT) growth rate of 2.0%/year	Existing facilities improved to modernize systems and improve operations and maintenance	A limited number of new rail and public transportation lines and services will be initiated
Scenario 3 – Fully Integrated System (Increase Market Share)	Ridership growth will outpace Virginia's population and VMT growth rate of 3.5%/year	All vehicles replaced at federally recommended cycles; all other facilities modernized to improve quality of service	All planned public transportation and rail projects will be funded; basic services will be provided in all jurisdictions

The scenarios outlined above were the basis for development of the statewide needs assessment. Where possible, the needs assessment used existing planning studies. Where such information was not available, needs estimates were developed based on federally recommended vehicle and other capital asset replacement cycles and the facility modernization requirements that were identified by Virginia's transit agencies.

Given the long-term nature of these needs estimates, forecasts were grouped into the categories of urban, small urban, and rural systems. System-by-system forecasts are difficult to define given the shifting responsibility for services, the uncertainties of local population and employment forecasts, and uncertainties about local financial resources, particularly for the smaller jurisdictions. All estimated costs are presented in terms of year-of-expenditure (YOE) dollars.

As shown on Figure 26, the total estimated capital needs over the period 2005-2025 range from approximately $7.8 billion for Scenario 1 – Status Quo to approximately $15.7 billion for Scenario 2 – Strategic Investments and approximately $23.9 billion for Scenario 3 – Fully Integrated System. Similarly, the total estimated operating cost needs over the period 2005-2025

range from approximately $16.8 billion for Scenario 1 to approximately $19.4 billion for Scenario 2 and approximately $26.0 billion for Scenario 3.

FIGURE 26. STATEWIDE PUBLIC TRANSPORTATION, RAIL, AND TRAVEL DEMAND MANAGEMENT NEEDS 2005-2025 (MILLIONS OF YEAR OF EXPENDITURE DOLLARS)

Scenario 1		Scenario 2		Scenario 3	
Capital	Operating	Capital	Operating	Capital	Operating
$7,747.66	$16,796.00	$15,695.80	$19,432.31	$23,859.35	$26,011.16

While each community in the Commonwealth should make its own decisions as to the type and amount of public transportation services that it will support, the fact remains that substantial funds will be required just to maintain the existing services in their current condition. As the definition of the "status quo" implies, the capital and operating needs associated with Scenario 1 can be viewed as the minimum funding levels necessary to maintain a basic level of public transportation, rail, and travel demand management programs over the next 20 years. Note, however, that funding at the "status quo" level translates into a loss in market share. For more information on this analysis, see the entire *Rail, Public Transportation, and Travel Demand Management Needs Assessment Report.*

In light of the events of 9/11, DRPT has coordinated meetings with rail and transit officials to determine security needs. Although estimates were not available from all rail and transit companies, security needs ranging from gates to training for personnel of at least $22 million were identified.

Summary of Needs for all Transportation Modes

Figure 27 shows that the total capital, maintenance, operating, and security needs for all transportation modes will exceed $203 billion over the 2005-2025 period. Note that the needs may sometime overlap because the same need may have been identified in multiple modal needs assessments, particularly with respect to the highway and transit needs. Additionally, the Rail, Transit, and travel demand management needs included in the table are for Scenario 3 – Fully Integrated System (not including security needs). Additionally, operating (and security) needs for DOAV and VPA are not included because they are funded by special dedicated funds.

FIGURE 27. TOTAL TRANSPORTATION NEEDS OVER THE NEXT 20 YEARS (BILLIONS OF $)

Mode	Total 20-Year Estimated Needs
Aviation	$5.5
Port	1.9
Rail, Transit, and Travel Demand Management	49.9
Highways	145.9
Total	**$203.2**

"Rules of Thumb" Transportation Costs

- $10 million for new airport
- $1 million for a general aviation terminal building
- $50,000 to $100,000 for a freight car
- $1.8 million to $3 million for a rail passenger car
- $300,000 to $400,000 for a transit bus
- $4,000 to $10,000 per space for a park-and-ride lot
- $15 million per mile for a four-lane divided primary road in a rural area
- $30 million per mile for a four-lane urban interstate
- $3 million for a 200 foot bridge on a four-lane divided highway
- 25% of total construction costs for right of way in a rural area; 60% in an urban area; 100% in the central business district

CHAPTER 9. FUNDING ADEQUACY FOR ALL MODES

As the modal needs assessments show, the needs across the transportation modes exceed $203 billion. This chapter contains a review of the sources of revenue used to fund the various transportation modes and examines the adequacy of those sources of revenue. New investment options and strategies are discussed in the final section.

Highways

Funding Sources

Virginia's highways are funded through a combination of state, federal, and local revenues. State revenues are derived principally from the 17.5 cents per gallon state motor fuels tax, one-half percent retail sales and use tax, three percent motor vehicle sales and use tax, and motor vehicle registration fees. These taxes and fees are deposited into two funds: the Highway Maintenance and Operating Fund and the Transportation Trust Fund (TTF). HMOF revenues (roughly $1.3 billion in FY 2005) are dedicated principally for the operation and maintenance of roads. TTF revenues (roughly $1.0 billion from state sources in FY 2005) finance the construction of new transportation infrastructure. Current law divides the TTF investment according to a formula: highways (78.7 percent), mass transit (14.7 percent), ports (4.2 percent), and airports (2.4 percent). As shown in Figure 28, total transportation revenues from all sources (including federal) are expected to amount to $3.1 billion in FY 2005.

In setting priorities, Section 33.1-23.1 of the *Code* states, " The CTB shall allocate each year from all funds made available for highway purposes such amount as it deems necessary for the maintenance of roads…" For many years the HMOF was sufficient enough to meet maintenance needs as well as finance some construction. However, the so-called "cross-over" has occurred, as the growth rate in the HMOF has been less than that for inflation, and maintenance costs have increased $50 million each year, reducing funds for construction. Funds from the TTF ($3.6 million) were first transferred to the HMOF in FY 2002. Subsequent transfers were $147.2 million and $56.9 million in FYs 2003 and 2004, respectively

FIGURE 28. KEY TRANSPORTATION REVENUE SOURCES - FY 2005 ESTIMATES (MILLIONS OF DOLLARS)

Source	Estimate	Percent of Total
State Motor Fuel Taxes (17.50 cents/gallon)	$860.5	27.3
Motor Vehicle Sales and Use Tax (3%)	593.5	18.8
Motor Vehicle License Fee ($29.50)	211.5	6.7
State General Sales and Use Tax (0.5%)	417.5	13.3
Federal Funding	764.8	24.3
Other	301.3	9.6
Total	**$3,149.1**	**100.0%**

At approximately $764.8 million, federal revenues are the second largest single source of funding for highway programs. Since 1986, federal receipts for highway projects have increased 200 percent and comprise 24.3 percent of all revenues and more than 60 percent of the highway construction program. Federal funding is expected to increase with the reauthorization of the Federal Aid Highway and Transit Program. Two bills are currently being considered in Congress. The Senate introduced a bill at $318 billion (approximately a 43 percent increase in guaranteed funding over TEA-21 [Transportation Equity Act for the 21st Century]) in contrast to the House bill of $275 (which represents a 33 percent increase over TEA-21). The Conference Committee has not agreed on the funding level and is not expected to produce a long-term bill in 2004. Current law was extended through May 2005.

Tolls have also been used as a means to finance constructing, improving, operating, and maintaining highway facilities in Virginia. The Virginia Constitution, Article X, Section 9c provides that the General Assembly may authorize the creation of debt secured by a pledge of net revenues derived from rates, fees, or other charges. Tolls have been used as a vehicle to pay debt service payments when legislation has authorized the issuance of bonds for highway projects. Examples of major projects in which tolls have been used include the Hampton Roads Bridge Tunnel, Elizabeth River Tunnels, Norfolk-Virginia Beach Toll Road, Chesapeake Bay Bridge/Tunnel, Dulles Toll Road, Dulles Greenway, Richmond Petersburg Turnpike, Richmond Metropolitan Authority Expressway and Boulevard Bridge, and Powhite Parkway Extension Toll Road. Tolls have generally been removed when the bonds are retired.

There are limits to the extent that tolls can be used. Federal law prohibits charging tolls on the interstate except for reconstruction or replacement of a bridge or tunnel unless part of a pilot program. There are two pilot programs in effect, the Value Pricing Pilot and the Interstate Rehabilitation and Reconstruction Pilot. The former allows states to use innovative methods to manage congestion such as allowing individuals in single occupant vehicles to pay a toll to ride in HOV lanes, referred to as HOT lanes. The Interstate Rehabilitation and Reconstruction Pilot permits states to collect tolls on a highway, bridge, or tunnel on the interstate system to reconstruct or rehabilitate corridors that could not be adequately managed or functionally improved. Whether the pilots will be continued or expanded has not been determined.

In addition to federal limitations in the use of tolls, Enactment Clause 3, Chapter 593 of the 2002 Acts of Assembly, prohibits the use of tolls or user fees on Interstate 81 on passenger cars, pickup or panel trucks, and motorcycles, unless FHWA approves a pilot project for Interstate 81 permitting the use of tolls on such vehicles.

The use of debt escalated significantly with the passage of the Virginia Transportation Act in 2000, which established a new Priority Transportation Fund. This legislation included a new source of debt known as FRANS (federal reimbursement anticipation notes), whereby the Commonwealth pledged future payments from federal sources and dedicated a portion of the state's General Fund to support that debt and jumpstart a number of projects specified by the Act.

With the passage of the Public-Private Transportation Act (PPTA) in 1995, Virginia ventured into leveraging private funds to construct public-use facilities. Hailed as one of the most innovative initiatives of its kind, the Act permits private companies to construct, own, maintain, and operate transportation facilities under contract with public bodies where there is a public need. Upon expiration of the term of the contract, ownership of the facility reverts to the public entity.

VDOT has received more than 40 PPTA proposals. The first major project awarded under the current PPTA was the contract awarded in 1996 to Virginia Maintenance Services to maintain interstates. The Interstate 895 Pocahontas Parkway project, opened in 2002, was the first construction projected completed under a PPTA. Since that time, PPTA comprehensive agreements have been executed for Route 288, Route 28, the Coalfields Expressway, the Route 199 Corridor, Route 58, and the Dulles Corridor Bus Rapid Transit Project. Other active proposals include the Interstate 81 Corridor, Interstate 495 HOT Lanes, and the Hampton Roads Third Crossing.

Detailed discussions of transportation funding sources can be found in the *VTrans2025* Phase 2 Report to the General Assembly, *House Document No. 38*, 2003 and *A Citizen's Guide to Transportation Policy Concerns in Virginia* prepared for VDOT by Virginia Tech, 2003.

Adequacy of Funds

One means of determining the adequacy of highway funds is to compare needs from the *2025 Highway Needs Assessment* with estimates of revenues for the 2005-2025 period. Starting with the Virginia Department of Taxation's Official 2004-2010 estimates as a base, the following assumptions were used to develop revenue estimates:

- State taxes and fees in the HMOF will grow by roughly 1.7 percent per year.
- State taxes and fees in the TTF will grow by roughly 2.2 percent per year (the TTF contains one-half percent retail sales and use tax, which grows faster than traditional highway user taxes and fees).
- Federal revenues will grow by 1.6 percent per year.

The result is that $71.7 billion in revenue is expected to be generated for highways over the 2005-2025 period. This estimate of available revenues is less than one-half of the $145.9 billion in total highway needs.

While the difference between estimated revenues and needs is substantial, the result is consistent with similar results provided in previous reports. Consider the 1988 Commission on the Future of Transportation study in which an inflation-adjusted unmet highway need of $53.8 billion for the 1998-2017 period was estimated (see the Interim Report of the Commission on the Future of Transportation in Virginia, *House Document No. 12*, 1988). The Joint Legislative Audit and Review Commission (JLARC) in a 2002 report estimated 20-year highway needs of

$58.3 billion, in constant dollars (see *Equity and Efficiency of Highway Construction and Transit Funding*, JLARC, 2002).

Given the formidable level of unmet needs, a second method was used to ascertain a minimum level of investment required to sustain a viable highway construction program. A viable highway construction program is defined as one in which: (1) the recent trend of transferring construction funds to the HMOF is reversed, (2) available federal funds are fully matched, and (3) funds are available for new projects. Currently, highway construction is a residual after allocations for debt, support to other agencies and the General Fund, maintenance, operations and administration, support to other modes, earmarks and special construction programs, interstate construction, and unpaved roads. Application of this particular methodology yielded the results shown in Figure 29. As can be concluded from the table, approximately $10.7 billion would be available for highway construction over the 2005-2025 period, which is $2.8 billion less than what is needed to complete the highway projects in the current six-year program.

FIGURE 29. TOTAL ESTIMATED REVENUES AVAILABLE FOR HIGHWAY CONSTRUCTION PROJECTS OVER THE NEXT 20 YEARS (BILLIONS)

Total Estimated 20-Year Highway Revenues	$71.7
Debt Service	-3.4
Maintenance	-38.7
Administration and Other Activities	-18.9
Total Available for Highway Construction Over 20 Years	**$10.7**

Highway Projects in the Six-Year Program	$5.3
Cost to Complete Existing Highway Projects	8.2
Total Needed to Complete Six-Year Program	**$13.5**

Estimated Shortfall	**$2.8**

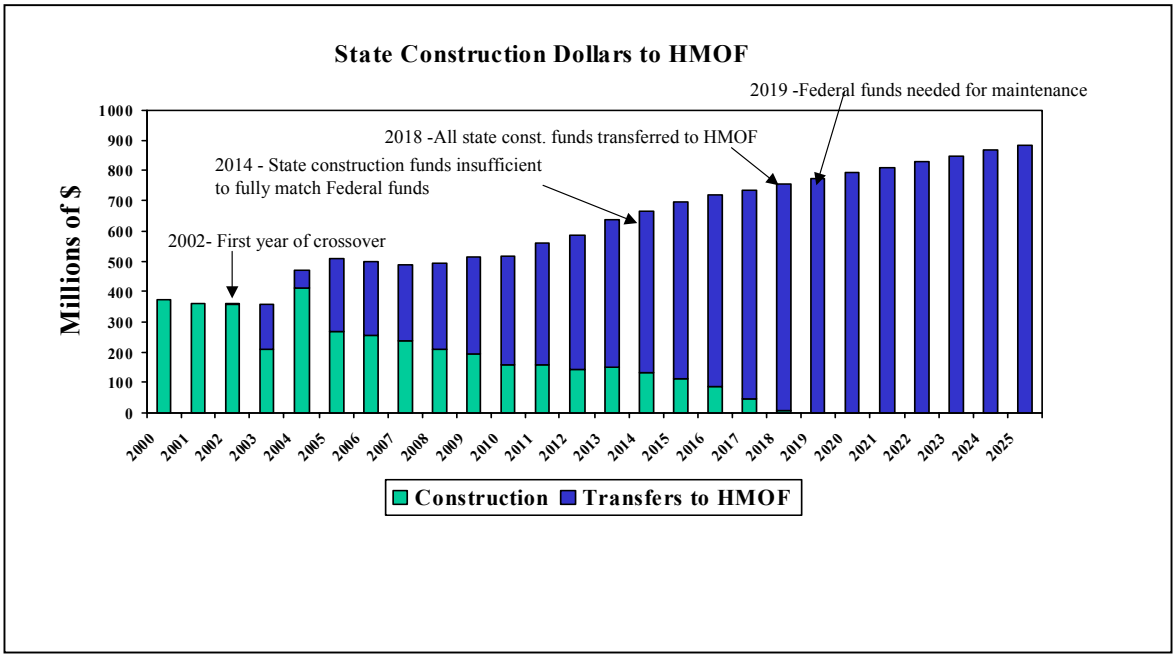
The implications of this analysis (shown graphically in Figure 30) include:

- Revenues will be insufficient to complete highway projects in the Six-Year Construction Program.

- Starting in 2014, the state will no longer be able to fully match federal funds, meaning the state would collect less federal revenue if it continues to utilize federal funds only for construction. (Note that the precision of this date is limited to the extent that the future can be predicted, and will change with new federal appropriations and revised economic forecasts.) If federal revenues increase, this situation will occur sooner.

- Starting in 2018, all TTF construction state funds will be used for maintenance and maintenance will be increasingly supported by federal funds. This means less money would be available for construction purposes. It also presents another difficulty. Only one third of the primary, secondary, and urban roads are eligible for federal funding (only 20 percent of the urban and 19 percent of the secondary lane miles are eligible). This is what is refereed to as a "double-bind." Very few secondary road projects could be undertaken with federal money; but using state money for those roads means the overall funding would decrease leaving more of the system without funds.

FIGURE 30. HIGHWAY CONSTRUCTION FUNDS REQUIRED FOR MAINTENANCE



To provide policy and decision makers with an idea of the level of investment required to alleviate the above shortfalls, several scenarios assuming additional investment levels were analyzed. It was also assumed that the additional investment would be generated from traditional transportation revenue sources and, as such, would increase roughly 1.7 percent per year. The result of this analysis is that at least $925 million per year in additional investment is required to enable the state to fully match federal funds over the period 2005-2025 and keep the highway construction fund whole. Higher maintenance costs and additional federal funding that requires increased state matching funds will push investment needs higher.

Aviation

Funding Sources

Federal and state grants and local revenues fund airport capital programs in the state. The FAA awards grants to airport sponsors. The Commonwealth Airport Fund (CAF), $19.1 million and 2.4 percent of the TTF, provides money for capital improvements. The $9.3 million Aviation Special Fund, which is comprised of the aviation fuel tax, aircraft sales and use tax and miscellaneous licenses, provides for maintenance, air service development, equipment, and security among other items. Local funding may originate from local jurisdictions, airport revenues, bonds, and/or from passenger fees.

Adequacy of Funds

For aviation, the adequacy of funds was determined by comparing the needs discussed above with 2005-2025 revenue estimates from state, federal, and local sources. State revenue estimates are a multiple of TTF revenues, and federal and local estimates were provided by the DOAV. Over the 20–year period, revenues from all sources are expected to amount to $2.4 billion. Compared to estimated needs of $5.5 billion, this represents an unmet need of $3.1 billion. The implication of the under-investment in aviation is that a number of the capital improvement projects identified in the VATSP update will not be implemented.

Public Transportation and Rail

Funding Sources

Transit, travel demand management, and ridesharing are funded by a combination of federal, state, and local funds, and farebox revenues. In FY 2005, expenditures for public transportation, including operating expenses and capital projects, are expected to total around $693 million, distributed as follows: fare box revenues ($202 million), local funds ($186 million), state funds ($135 million), and federal funds ($170 million). Included in the total for federal funds is $19 million from the federal highway account that is flexed over to support transit projects. The MPOs for the three large urbanized areas of Virginia program certain highway funds to support transit. The state funds come from mass transit's 14.7 percent share of the TTF.

Most federal money that supports public transportation in Virginia is provided by FTA and goes directly to the three largest transit systems – the Washington Metropolitan Area Transit Authority (WMATA), Hampton Roads Transit (HRT), and the Greater Richmond Transit Company (GRTC). These funds do not pass through the state budget. All state funding and other federal funding for the remaining public transportation providers and fifteen travel demand management programs pass through DRPT.

Currently, a disparity exists in funding responsibilities between transit and highways. In FY 2005, federal and state funds will support between 98 and 100 percent of the cost of building and maintaining the state system of highways (as opposed to roads constructed by localities). For most transit service, the state will provide 43 percent of the cost, while localities will pay 27 percent and the riders will pay another 30 percent. Under the *Code* a local jurisdiction may elect to use highway funds to support transit projects and the higher levels of federal and state support will apply. The CTB can also choose to use highway funds for transit and the match may come from state highway funds, or they may choose to fund a transit project with state highway funds entirely. However, a highway project must be delayed or foregone in order for a locality or the CTB to exercise this option and the demand for highway funds in virtually every jurisdiction of the Commonwealth far exceeds the supply. As a result, this provision of the *Code* has not significantly impacted the funding shares for public transportation in Virginia. It is argued that the financial responsibility on localities for operating expenses leads to over reliance on the fare box revenue, which can depress rather than encourage the use of transit. Moreover, the state's share of both transit operating expenses and capital expenses is projected to decrease in the future, and no major increases in federal transit funding are predicted. As a result, the burden of funding public transportation will continue to fall to local governments, diminishing the ability of public transit to support a multimodal transportation program.

Freight rail is funded by two state sources for capital improvements and two federal sources. The state sources include the Rail Preservation Program and Industrial Access Program of $5.0 million to $6.0 million annually. Federal funds sometimes are available to projects in high-speed corridors of Virginia from the Railway-Highway Crossing Hazard Elimination Program ($0 in FY 2004; $6.7 million received since 1993), and from the Section 130 Railway Highway Crossings Program ($8,710 in FY 2004). Funding to support specific railroad improvements related to highway projects is provided on occasion from highway funding programs such as the federal Surface Transportation Program (STP) and the state Bridge Fund. Examples of these projects include highway bridge projects to improve Norfolk Southern's double stack route, the rail bridge over Braddock Road in Northern Virginia, and the Four-Mile Run Bridge in Northern Virginia. Similar to highways and transit, rail benefited from the Virginia Transportation Act of 2000, which allocated over $65 million for rail improvements in the Richmond to Washington, D.C. corridor. The Act also allocated $9 million for the TransDominion Express, a concept to provide passenger rail from Bristol through Lynchburg, Charlottesville, and other localities.

There is no state funding in Virginia to support intercity passenger rail. Amtrak provides intercity passenger rail service in Virginia but receives its funding from the federal government. The commuter rail services operated by VRE are considered a form of public transportation and these services are supported by federal and state public transportation funds.

A Commission on Rail Enhancement for the 21st Century was established by Executive Order to examine the future of rail transportation in the Commonwealth. The Commission will also provide leadership on freight and passenger rail issues, policies, and needs, as well as examine options for leveraging private and public funding for rail service and infrastructure across the Commonwealth.

Adequacy of Funds

The DRPT report, *Rail, Public Transportation, and Travel Demand Management Needs Assessment*, contains a detailed analysis of unmet rail, public transportation, and travel demand management capital and operating needs. Extrapolating current and historically observed federal and state funding levels into the future, it is estimated that approximately $5.4 billion will be available to support capital investments over the 2005-2025 period. This compares to capital needs ranging from $7.7 billion (Status Quo Scenario) to $23.9 billion (Fully Integrated System Scenario), suggesting unmet transit, rail, and travel demand management capital needs ranging from $2.3 billion to $18.5 billion.

Similarly, estimated operating funding levels from federal, state assistance, passenger, and other revenues are expected to range from between $11.1 billion (Status Quo Scenario) to $13.8 billion (Fully Integrated System Scenario). Compared to identified operating needs ranging from $16.8 billion to $26.0 billion, unmet transit, rail, and travel demand management operating needs range from $5.7 billion to $12.2 billion over the 2005-2025 period.

In summary, transit, rail, and travel demand management capital and operating unmet needs range from $8 billion or $381 million per year (Status Quo Scenario) to $30.7 billion or $1.5 billion per year (Fully Integrated System Scenario). While local government funding could reasonably be expected to make up some portion of the capital and operating transit shortfalls, a significant under-investment exists and a disparity exists between state funding of highways and transit. For rail, some of the unmet needs could reasonably be expected to be satisfied by one-time federal, state, and railroad owner investments. But to realize a vibrant rail system, a dedicated fund for freight and intercity passenger rail is needed, just as the 1986 Special Session created dedicated funding for mass transit, airports and ports.

The implications of the continued under investment in transit, rail, and travel demand management programs include:

- Transit will be crippled in its fight to control the growth of urban traffic congestion.
- Service levels (some systems are at or approaching capacity) will be compromised.
- The elderly, disabled, and low income Virginians across the state will see increased isolation from basic human services.
- Fares will have to increase, which may discourage ridership.
- Virginia will continue the status quo approach to transportation planning and investment, which was rejected by stakeholders in the six vision planning sessions and by citizens in the statewide telephone survey.
- Freight traffic diversion to trucks will increase resulting greater highway congestion and increased wear and tear on roadways.

Ports

Funding Sources

There are three major sources of funding for VPA – state appropriations, the Commonwealth Port Fund (CPF), and terminal revenues. In addition, the federal government cost-shares dredging activities and provides grant funding for security enhancements. VPA receives 4.2 percent ($33.2 million in FY 2005) of the TTF, which is used for capital improvements. Terminal revenues are used to fund operating costs.

Adequacy of Funds

VPA' s *2040 Master Plan* indicates that the port has the capacity to fund a significant portion of planned investments except for the state's share of the cost to construct levees for the eastward expansion of Craney Island and the 55-foot channel dredging project. Funding for both projects is expected to be shared between the U.S. Army Corps of Engineers and the state. The state has traditionally funded such dredging projects with a special appropriation.

The eastward expansion of Craney Island will add 600-acres and become the site of the port's fourth marine terminal. Starting in 2012 and continuing until 2032, VPA will be able to finance the construction costs for the marine terminal through existing CPF and terminal revenues. However, the port will need additional funds ($240 million) from the state to design, engineer, and build containment levees for Craney Island.

Authorized by the U.S. Congress in 1986, the specific timeline for the 55-foot dredging project is uncertain due to a decrease in the level of regional coal exports that were used to justify the project. The potential for regional coal imports or future growth container ships could re-introduce the project, but this is not expected until at least 2015. The state's share for this project is estimated at $122.8 million.

As for security, VPA has been successful in competing for federal TSA security funds. Thus far, VPA has received $11.4 million in federal funds and has spent $12.4 million in Port Funds. VPA does not anticipate any special state appropriation funds for security.

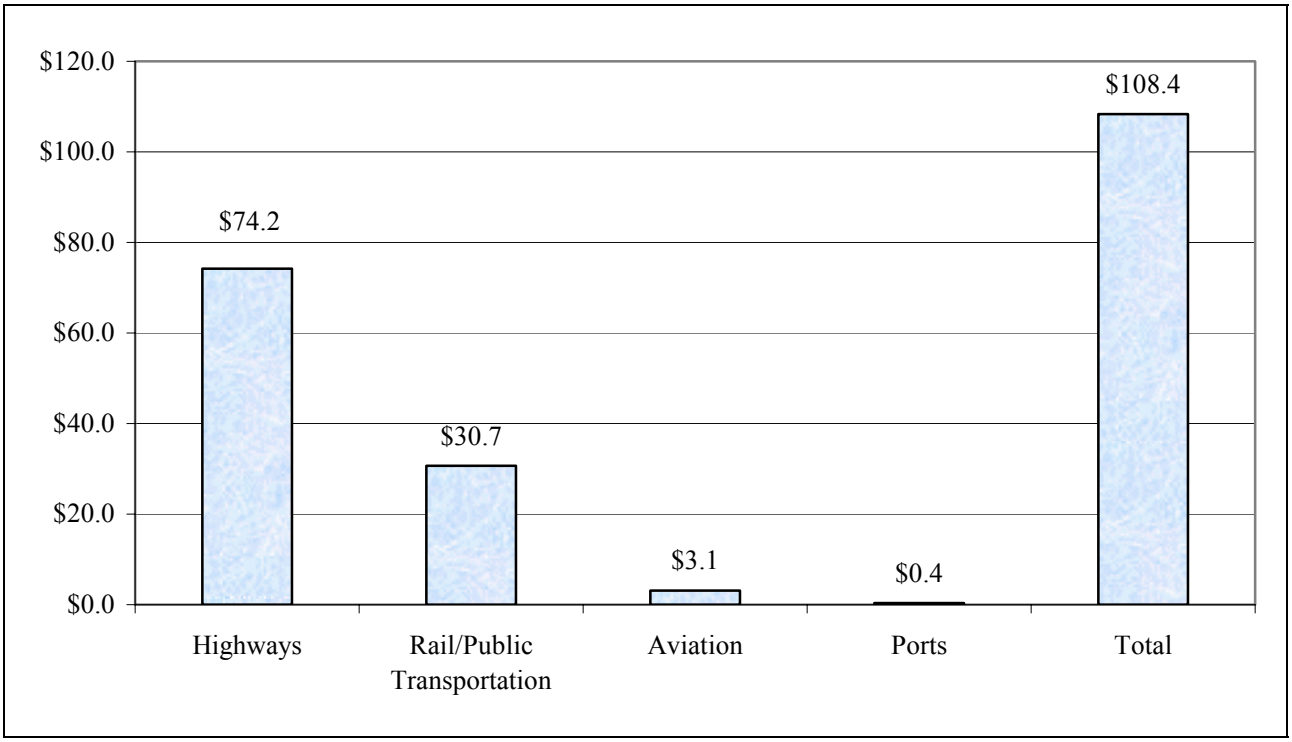
In total, VPA's unmet needs over the 2005-2025 period amount to $363 million. The projects comprising these unmet needs have been planned to be beneficial to the entire Commonwealth as they facilitate the flow of goods and services, while maintaining the competitive strength of the port. If the Commonwealth fails to appropriate the necessary funds, the survival of the projects will be threatened and the potential benefits will not be realized.

Summary for All Modes

Over the 2005-2025 period, capital, maintenance, operation, and security needs of all transportation modes in Virginia will exceed $203 billion, while the best estimate of revenue available will total $95 billion ($71.7 billion for highways, $19.2 billion for rail, transit, and

travel demand management, $2.4 billion for aviation, and $1.6 billion for ports) for the same period. As this gap between needs and available revenues demonstrates, the Commonwealth is significantly under-investing in its transportation network. This is illustrated in Figure 31. At a minimum, an additional investment of $925 million per year for highways alone is required to enable the state to fully match federal revenues and keep the highway construction fund whole. Higher maintenance costs and additional federal funding that requires increased state matching funds will push investment needs higher. Consideration of the other modes will substantially increase the annual investment needed.

FIGURE 31. UNMET NEEDS BY MODE 2005-2025 (BILLIONS)



Transportation Investment Options and Strategies

Several options and strategies for addressing the under-investment have been discussed during the deliberations of the *VTrans2025* Policy Committee, or have surfaced as a result of *VTrans2025* staff reports and research. These options and strategies run the gamut of strategies that facilitate continuous funding for additional capacity to one-time investment strategies that facilitate more efficient use of the infrastructure. A summary of these options and strategies follow.

Investment Options

- **Increase traditional transportation taxes and fees** – Traditional revenue sources for financing transportation in Virginia include the motor fuel tax, the motor vehicle sales and use tax, and vehicle registration fees. Estimates of the amount of revenue generated per year by a unit increase in these traditional tax sources are shown in Figure 32.

FIGURE 32. ESTIMATED REVENUES FROM A UNIT INCREASE IN TAX/FEE FY 2005 (MILLIONS $)

Source	Estimated Revenue
1 cent increase in motor fuel tax	$51.0
1% increase in motor vehicle sales tax	$208.0
$1 increase in registration fees	$6.0

- **Index Motor Fuel Tax** – The current state motor fuel tax is a flat tax on gallons consumed, which means that fuel tax revenues do not increase with the costs of constructing and maintaining transportation facilities. One remedy to this discrepancy is to index motor fuel tax rates with an appropriate measure of inflation. Such an index should have a trigger for when it begins and an annual and/or overall cap.

- **Apply Retail Sales Tax to Motor Fuel** – Under §58.1-1720 of the *Code*, localities that are in a transportation district containing a rapid heavy rail commuter mass transportation system, or in any transportation district contiguous to the Northern Virginia Transportation District, are allowed to impose a tax of two percent of the retail price of fuel sales. A variation of this provision is a statewide application of the five percent general sales tax to the retail price of motor fuel. Another variation is to allow other localities to use this form of taxation by removing current restrictions. Because of the instability in motor fuel prices, this type of tax should have a trigger for a floor and a cap.

- **Give Localities Authority to Levy Transportation Taxes and Fees** – Because Virginia is a Dillon's Rule state, the General Assembly must grant express permission for localities to raise taxes and fees.

- **Utilize the General Fund** – Although a departure from the traditional user-pay concept for funding transportation, earmarking the one-half percent general sales tax to the TTF by the 1986 Special Session set the precedent for using General Fund revenues to fund transportation. General Funds were earmarked for transportation again by the Virginia Transportation Act of 2000, in which one-third of the tax on insurance company premiums was earmarked for priority transportation projects (the 2004 General Assembly returned these funds to the General Fund). A model can also be found at the federal level where General Fund revenues are used for transportation, mostly for transit, and are walled off from other General Funds so that they can only be used for transportation purposes. Moreover, the gap between transportation needs and revenues

exceeds $108 billion and would require increases in traditional transportation taxes to untenable levels.

- **Expand use of tolls** – Tolls have been used to finance a number of transportation projects in Virginia. The emergence of technology for electronic toll collection and automated toll roads combined with the user-pay benefit of tolls suggest that strategic use of tolls should be included in the mix of transportation investment options under consideration.

- **Encourage the Use of PPTA's** – As was discussed earlier, VDOT has received over 40 PPTA proposals, many of which have been advanced to contract. PPTA's allow for the state to partner with the private sector to build transportation facilities quicker and in general, with less state and federal money.

- **Increase Use of Special Tax Districts** – Through legislation enacted in 1987, the General Assembly enabled localities to create special tax districts to fund transportation projects. Fairfax and Loudoun Counties partnered with Route 28 landowners and formed the first transportation improvement district in the Commonwealth. A portion of the Prince William Parkway is funded in this manner. More recently, in February 2004, Fairfax County approved a petition with commercial landowners to form a tax district to fund its share of the Dulles Corridor Bus Rapid Transit Project.

Other Strategies

- **Utilize One-Time Investments** – If no major ongoing new investment in transportation is forthcoming, consideration could be given to one-time type investments that address critical safety and security needs and those that facilitate stretching limited public funds by leveraging private funds. Examples could include a special fund for unfunded security needs or revolving funds for rail/transit improvements and PPTA's.

- **Protect Transportation Revenues** – A key finding from the public and stakeholder outreach activities was that the public has no confidence that transportation revenues will be used for transportation purposes. This lack of public trust can be addressed through an appropriate mechanism, including the consideration of a constitutional amendment to require all funds in the HMOF and TTF to be expended for transportation purposes only. However, prior to consideration of a constitutional amendment, a full examination of all of the ramifications of such an amendment should be conducted.

- **Establish a Funding Source for Rail** – Currently, there is no state funding source to support intercity passenger or freight rail. Freight is expected to double over the next two decades and most freight corridors are already experiencing heavy traffic. This has implications for passenger rail as well, since they share the same rights of way. Moreover, rail should be in the mix of solutions for the transportation capacity problems expected in the future. Additionally, a separate rail fund should promote a partnering relationship with the private sector, using state funds to leverage private sector investment.

- **Create a Multimodal Fund** – If a new transportation investment program is devised, consideration should be given to creating a multimodal fund to finance multimodal projects of statewide significance. This new fund could be an off-the-top allocation of new funds with the balance going through traditional formula.

- **Encourage Operational Improvements** – Strategies that improve the efficiency of our transportation facilities – getting more out of the current infrastructure – through the use of ITS and other innovative transportation system management processes should be increased in the mix of transportation investments.

- **Encourage Use of Demand Management** – A new transportation investment program should include increased attention to strategies that manage the demand for highway travel such as ridersharing, telecommuting, HOV lanes, staggered work hours, additional investments in rail, transit and bikeways, and peak-hour road pricing.

APPENDIX A. §33.1-23.03 OF THE CODE

CHAPTER 639

An Act to amend and reenact § 33.1-23.03 of the Code, relating to the Statewide Transportation Plan; preparation to stress statewide perspective.
[H 771**]**
Approved April 6, 2002

Be it enacted by the General Assembly of Virginia:
1. That § 33.1-23.03 of the Code is amended and reenacted as follows:
§ 33.1-23.03. Board to develop and update Statewide Transportation Plan.
The CTB shall conduct a comprehensive review of statewide transportation needs in a Statewide Transportation Plan setting forth an inventory of all construction needs for all systems, and based upon this inventory, establishing goals, objectives, and priorities covering a 20-year planning horizon, in accordance with federal transportation planning requirements. This plan shall embrace all modes of transportation and include technological initiatives. This Statewide Transportation Plan shall be updated as needed, but no less than once every five years. The plan will provide consideration of projects and policies affecting all transportation modes and promote economic development, intermodal connectivity, environmental quality, accessibility for people and freight, and transportation safety. Each such plan shall be summarized in a public document and made available to the general public upon presentation to the Governor and General Assembly.

It is the intent of the General Assembly that this plan assess transportation needs and assign priorities to projects on a statewide basis, avoiding the production of a plan which is an aggregation of local, district, regional, or modal plans.

2. That the first phase of the plan prepared in accordance with the provisions of this act shall be presented on December 1, 2002, and shall include: the vision, goals, and objectives of the plan; criteria for establishing priorities; identification of major needs; a public involvement plan; a summary of public involvement to date; an interagency coordination plan; an evaluation and recommendation for selection of a highway needs-assessment tool; and, a status report on the modal needs assessments. The second phase of the plan shall be presented on December 1, 2003, and include: a status report on the existing transportation system; a status report on the modal needs assessments; and, consideration of policies affecting all transportation modes, including technology, economic development, intermodal connectivity, environmental quality, accessibility for people and freight, transportation safety, and revenue sources and availability. The third phase of the plan shall be presented on July 1, 2005, and include: an inventory and prioritization of statewide multimodal transportation needs; an assessment of intermodal connectivity and accessibility; a summary of public involvement activities and comments; and, a final report.

APPENDIX B. *VTRANS2025* PUBLIC AND STAKEHOLDER OUTREACH EFFORTS

Phase 1 Outreach Efforts

Phase 1 outreach activities centered on gathering information on what should be in the plan, identifying what people see as a vision for the transportation system in Virginia, and identifying long-range goals. A three-pronged approach was initiated to obtain this input primarily through a series of discussion group meetings, informal questionnaires, and stakeholder group meetings. Major issues identified included the need for more coordinated multimodal planning, more transportation alternatives in both urban and rural areas, more coordination among the transportation agencies, and more coordination between transportation and land use. Based on this input, draft vision, goals, and objectives were formulated. In addition, input during Phase 1 activities was used during Phase 2 to develop a series of long-range vision scenarios for transportation in the Commonwealth.

Discussion Group Meetings

In the fall of 2001, 12 discussion group meetings were held across the state to introduce the statewide planning effort and gather stakeholder input on a long-range vision for transportation in the Commonwealth. One meeting was held in each of the nine VDOT construction districts, with an additional meeting held in the Hampton Roads, Culpeper, and Northern Virginia districts. Specific individuals were targeted for these discussions, including elected officials, citizens, transportation professionals, and representatives from PDCs, chambers of commerce, transportation operators, advocacy groups, modal agencies, and public service agencies.

Efforts were made to ensure that the meeting location, time, and format promoted attendance and fostered a non-biased atmosphere that encouraged consideration of multimodal issues. Meeting locations were typically well-known community centers, such as public libraries, and were easily accessible (where possible, by public transit). A professional facilitator led the group through an informal transportation vision questionnaire provided to participants prior to the meeting. Attendees were encouraged to refrain from debating issues or attempting to reach a consensus in order to give all participants the opportunity to contribute their ideas. The informal questionnaire requested feedback on each transportation mode and numerous transportation-related issues with respect to several topics, including funding, infrastructure requirements, and priorities. In response to stakeholder feedback, the meeting format and several questions were modified during the visioning process to obtain more meaningful input.

During the meetings, comments were captured in three ways: by the facilitator on a flip chart, by staff through hand-written notes, and on a laptop projected for the audience to review. Participants were encouraged to revise or reword their comments as the meeting progressed. Where possible, participants had copies of summaries from previous meetings that served to spur conversation and generate additional comments. Following the meetings, summaries were sent to all participants for review and comment. Final meeting summaries were posted on the *VTrans2025* web site specifically developed for the plan.

Input from these meetings was used to draft the vision, goals, and objectives for the plan. To supplement input received during the initial discussion group meetings, planners specifically sought input from several stakeholder groups, including local elected officials, transportation operators, the business community, the transportation-challenged community, and state agencies. In the late summer and fall of 2002, staff attended previously scheduled conferences and annual meetings held by some of these groups. In addition, in the summer of 2002, an issue framing session was held for planners from the four modal state transportation agencies to identify key transportation issues facing the Commonwealth.

Informal Questionnaires

An informal questionnaire was used to facilitate discussion at the discussion group meetings held in the fall of 2001. In addition, stakeholders could attend a discussion group meeting and provide their comments, submit a completed questionnaire, or both. Input from the informal questionnaire was used in conjunction with data from the discussion group meetings to draft the vision, goals, and objectives for the plan. In the late summer and fall of 2002, an informal supplemental questionnaire was produced to target stakeholder groups that did not provide input through the initial meetings and questionnaire. These instruments were specifically used to obtain supplemental information from transportation operators and local elected officials given their key role in transportation. The informal supplemental questionnaire was distributed at the following conferences and annual meetings:

- Virginia Association of Counties, Hot Springs, November 10-12, 2002
- Virginia Municipal League Annual Conference, Norfolk, October 20-22, 2002
- Virginia Transportation Conference, Lexington, October 16-18, 2002
- Virginia Aviation Conference, Virginia Beach, August 20-22, 2002

Stakeholder Group

A Stakeholder Group was convened to assist in determining a process for proceeding with development of the statewide plan. The group, which consisted primarily of transportation agency representatives and interested stakeholders, reviewed best practices from other states and provided various perspectives on the draft vision, goals, and objectives.

Other Phase 1 Activities

Other Phase 1 activities included establishment of a *VTrans2025* web site (www.vtrans.org) and toll free phone line (1-866-835-6070). The web site provides information on past and upcoming meetings, the overall planning process and schedule, legislative requirements, contact information, and the availability of draft/final reports and documents. The phone line provides a convenient means for stakeholders to provide input on any aspect of the planning process. In addition, upon request, staff was available to meet with anyone who requested information on the plan. Details of the Phase 1 public and stakeholder involvement activities can be found in the *Final Phase 1 Report to the General Assembly* (House Document No. 10).

Phase 2 Outreach Efforts

The Phase 2 efforts built upon the Phase 1 activities and centered on development of a long-range vision for transportation in Virginia and validation of the goals and objectives defined in Phase 1. Using the input gathered during Phase 1, several long-range visions for transportation in Virginia were developed and presented to stakeholders for feedback. Input was sought primarily through a series of stakeholder meetings and deliberative forums aimed specifically at groups that were largely under-represented in Phase 1 activities, such as business and community leaders, public and social service providers, and the transportation disadvantaged. Several key problems facing passenger and freight transportation were identified, including traffic congestion, poor connectivity, inadequate travel choices, poor access to services, poor access to jobs, and inadequate resources.

Stakeholder Meetings

In the summer of 2003, six stakeholder meetings were held in major regions of the Commonwealth. Business and community leaders representing a wide variety of interests and organizations attended the meetings, which were held in Richmond, Fredericksburg, Charlottesville, Northern Virginia, Hampton Roads, and Roanoke. In order to provide feedback, many members of the original Phase 1 stakeholder group were invited to participate in these meetings. In addition to these six sessions, similar discussions were held with attendees at the Virginia Transit Association Meeting in May 2003 and the VAPDC Meeting in July 2003.

The purpose of the sessions, which generally lasted half a day, was to discuss with selected regional and local leaders their long-range vision for transportation throughout the Commonwealth and aspects of how that vision could be realized in future years. Professional facilitators led each meeting, and discussions were organized around a presentation describing the transportation planning context in the Commonwealth, including data about the existing transportation network, socioeconomic trends, and emerging strategies in long-range multimodal planning. Interwoven with the presentation were a series of questions and exercises that focused participant discussion on the following issues:

- Identification of the most important issues/problems in passenger and freight transportation.
- Relative importance of goals identified in Phase 1.
- Unmet needs in system preservation, operational improvements, and capacity expansion.
- Identification of a preferred vision for enhancing transportation and travel throughout the Commonwealth over the next 20 years and beyond.
- Changes in current state policies and procedures that would be needed to pursue the vision effectively.
- Ways to measure the success of *VTrans2025*.

In these meetings, there was broad recognition that more resources were needed for both passenger and freight transportation and that investment throughout the Commonwealth should be directed to relieving congested conditions, current and future, and improving connectivity and linkages among systems and services. Concerns included a strong interest in providing more balance in planning and investment across transportation modes. Stakeholders were willing to embrace a much more ambitious vision of the future of transportation than that supported by the status quo. Suggested changes in existing policies and programs included expanding transportation resources, enhancing regional decision-making, and improving delivery of the state's transportation programs. In general, findings from the stakeholder meetings were consistent across the state, with the exception of the relative importance of the *VTrans2025* goals. Opinions on this topic varied across the state and within each region. A statewide telephone survey during Phase 3 was used to determine the distribution of opinions throughout the Commonwealth. Details on these stakeholder meetings can be found in the *Synthesis of Findings from Six Stakeholder Vision Sessions* prepared for DRPT by Cambridge Systematics, Inc., December 5, 2003.

Issue-Framing Sessions and Deliberative Forums

Two issue-framing sessions were held to build upon and refine the issues identified in Phase 1 outreach activities. The first session targeted transportation agency professionals from all transportation modes. The second session included a wide range of transportation stakeholders, such as planners, developers, environmental advocates, and advocates for the disabled. Participants discussed how Virginia could create a world-class transportation system and identified numerous perspectives about transportation in the state. These perspectives and attitudes were compared to input received during Phase 1. Based on this comparison, three basic approaches to the future of transportation in Virginia were identified. A booklet was prepared to describe the essence of each approach, the pros and cons of each approach, and the trade-offs. The approaches were used to facilitate discussion at a series of deliberative forums and probe participant attitudes and values.

Deliberative forums were held at five locations across the Commonwealth, including Arlington, Danville, Newport News, Richmond, and Winchester. Citizens in Big Stone Gap and Lynchburg were invited to participate in a deliberative forum meeting as a pretest of the discussion guide. In addition, two classroom forums were held with high school students in Wytheville to get a youth perspective.

Participants were chosen using a non-random snowball sample. Beginning with a group of civic/non-profit organizations obtained from local chambers of commerce, individuals with differing interests in transportation were invited. These individuals were then asked to identify other members of civic or non-profit groups who might be able to participate in a forum on the future of Virginia's transportation system. Those additional individuals were invited, and so on until a sufficient number was obtained. Although this method provided a good means of gathering community views, it did not necessarily produce a representative group from each community. As a result, the views expressed at each forum represent only the participants in the forum, not necessarily the entire region or community. In that the goal of the forums was to

identify perspectives, concepts, and areas of agreement/disagreement that could later be tested through a survey, these forums were deemed a success.

A trained facilitator moderated each forum. Pre- and post-forum questionnaires were administered to gauge citizens' opinions on transportation and to see in what ways, if any, the dialogue caused changes in perspectives. Moderators used the discussion booklet, which described three basic approaches to the future of transportation in Virginia, to facilitate group discussion. Comments from the forums were categorized into numerous themes, which represent key stakeholder issues for consideration. From these discussions, eight key vision components were identified: (1) coordinated planning; (2) multimodalism, intermodal connectivity, mobility, and accessibility; (3) overall health of the community, environment, and economic development; (4) implementation and maintenance; (5) trust and funding; (6) education and incentives; (7) safety; and, (8) technology. Details of these meetings can be found in the *Final Report on Deliberative Forums* prepared by Virginia Tech for VDOT, October 2003.

Other Phase 2 Activities

Input from these meetings was combined with previous input and used to refine the goals and objectives developed in Phase 1, formulate a final vision for transportation, and develop a series of policy recommendations. Based on input received from these meetings, an additional goal to improve program delivery was defined to address the ability of the various state transportation agencies to execute programs and policies consistently, efficiently, equitably, and in a timely manner.

VTrans2025 staff attended numerous conferences to provide information and discuss the long-range plan with conference participants, including the following meetings:

- Dominion Directions, Richmond, March 25, 2003
- Bike Walk Virginia, Portsmouth, April 4-6, 2003
- Virginia Chapter of the American Planning Association/ VAPDC, Richmond, April 15-17, 2003
- Clean Commute Day, Richmond, May 2, 2003
- Virginia Transit Association, Richmond, May 28-30, 2003
- VAPDC, Virginia Beach, July 25, 2003
- Virginia Association of Counties, November 9-11, 2003
- VAPDC, Executive Directors Meeting, Charlottesville, November 21, 2003

Phase 3 Outreach Efforts

Whereas Phase 1 and Phase 2 efforts largely focused on gathering stakeholder and public input, Phase 3 efforts primarily involved processing that input and providing feedback to participants. In Phase 3, outreach to the general public was in the form of public meetings and a statewide telephone survey used to validate previous input. In addition, coordination with PDCs, MPOs, and local elected officials were key components of Phase 3 activities.

Telephone Survey

A statewide telephone survey was conducted to examine public opinions, attitudes, and values about transportation and expand on and test concepts and observations arising from prior outreach activities. The survey focused on alternative visions of what is to be accomplished in transportation, the relative importance of the six *VTrans2025* goals (discussed in Chapter 5), and related perceptions and values. The sampling plan ensured that reliable observations could be made about the perspectives of the major ethnic/racial groups in the Commonwealth and for major geographic areas, including major metropolitan regions, small urban areas, and rural areas. The survey was conducted in February 2004 and more than 1,200 completed surveys were obtained with a maximum statistical error of +/-2.8 percent.

With regard to the status of the current transportation system, survey findings showed the following key points:

- Road congestion and safety are top concerns.
- Transportation projects that result in reduced safety are not acceptable tradeoffs for system efficiency, mobility, economic competitiveness, or any other concern.
- Virginians do not want to sacrifice the environment for transportation improvements.
- Virginians want more transportation alternatives.
- In large urban areas, there is a strong focus on non-highway alternatives.
- In rural areas, road improvements are more important than enhancing other modes.
- Virginians want more involvement in transportation planning.
- There is support for increasing investment if revenues raised are used for transportation.

Although stakeholder-meeting participants ranked intermodalism and connectivity highest among various transportation values, survey respondents ranked enhanced safety, quality of life, and environmental protection highest. In fact, according to the survey, the goals that resonate with most Virginians are safety and security, quality of life, and doing the job on time and within budget. Threats to safety, the environment, and quality of life were more important than promises of transportation improvements. Transportation needs varied across regions, with a stronger focus on non-highway modes in larger areas and a stronger focus on roads in small areas. Overall, the survey shows that Virginians value the transportation choices they currently have but do not rate their performance highly. Virginians support paying higher taxes for transportation improvements but want assurances that funding is going to transportation improvements and that those improvements are completed within budget. Virginians prefer improvements to roads and public transportation over improvements to other transportation network infrastructure. Finally, Virginians support a more strategic and fully-integrated approach to transportation decision-making rather than the status quo.

The survey was used to validate input received in previous phases regarding the relative importance of the six *VTrans2025* goals and attitudes and perceptions about alternative visions. The entire body of stakeholder and public input was used to finalize the multimodal prioritization system and formulate the final vision for the future of transportation in the Commonwealth.

Planning District Commission and Metropolitan Planning Organization Summit

PDC staff has been involved in the development of *VTrans2025* from the beginning. A PDC representative served on the *VTrans2025* Technical Committee, which guided development of *VTrans2025*. In addition, PDC staff assisted with identifying stakeholders for the Phase 1 discussion group meetings and the Phase 2 stakeholder meetings, issue-framing sessions, and deliberative forums. Numerous informative briefings have also been provided throughout the process. During Phase 3, a summit with PDC and MPO representatives was held. The purpose of the summit was three-fold: (1) obtain feedback on the multimodal prioritization process, (2) plan for outreach activities for the draft plan, and (3) discuss how to improve multimodal planning. PDC executive directors, PDC chairs, MPO chairs, PDC transportation planning staff, and VDOT district planners were invited to participate in the meeting, which involved presentations and interactive discussions.

Discussion among the summit participants generated numerous recommendations, including (1) provide more clarity in the plan and the multimodal project prioritization process, (2) give more consideration to how rural areas fit in, (3) give more consideration to funding, and (4) get buy-in from policy leaders on the multimodal prioritization process up front. Participants also expressed a desire to be involved in the identification, documentation, and evaluation of the multimodal projects. As a result of input received at the summit, several modifications to the multimodal project prioritization process were made and a PDC advisory group was established to provide a mechanism for ongoing feedback.

Public Meetings

The public meetings for *VTrans2025* were held in 11 locations across the state, one in each VDOT construction district with 2 in Hampton Roads and Northern Virginia. These meetings were held to obtain public input on the draft Phase 3 *VTrans2025* report. The PDCs, who assisted with the logistics of the meetings, sent letters of invitation to local stakeholders and elected officials (typically 150 per PDC), placed advertisements in all local newspapers, and in some districts, made radio announcements. Letters of invitation were also sent from the Secretary to all members of the Senate and House of Delegates. In addition to *VTrans2025*, VDOT, Virginia Port Authority, DOAV and DRPT had displays and VDOT and DRPT were seeking comments on their draft modal plans. VDOT made available the State Highway Plan, the Statewide Bicycle and Pedestrian Plan, and the prioritization process. DRPT was seeking comments on the Rail, Public Transportation, and Travel Demand Management Needs Assessment.

The meetings locations are shown in Figure 33.

FIGURE 33. PUBLIC MEETING LOCATIONS

District	Date	Location
Fredericksburg	Wednesday, July 7	Caroline County Community Center
Bristol	Tuesday, July 20	Southwest Virginia Higher Education Center
Salem	Wednesday, July 21	Salem Civic Center
Staunton	Tuesday, July 27	Harrisonburg High School
Northern Virginia	Wednesday, July 28	American Legion Post 176
	Thursday, July 29	Dulles Expo and Conference Center
Richmond	Wednesday, August 4	Petersburg Train Station
Lynchburg	Thursday, August 5	Appomattox High School
Culpeper	Tuesday, August 10	Culpeper Train Depot
Hampton Roads	Wednesday, August 11	Thomas Nelson Community
	Thursday, August 12	Hampton Roads Planning District Commission

Every attempt was made to select meeting locations that were central to all PDCs located within the construction districts.

The meetings were an open house format. Each modal agency, and *VTrans2025*, had displays providing information on the processes and plans, and staff was on hand to answer questions. There was also a *VTrans2025* video available. Elected officials were invited to a pre-meeting briefing that included a presentation and a question and answer session.

In total, there were 372 participants at the 11 meetings. Of that number, there were 92 elected officials, 18 legislators, and 262 other participants that included staff from the PDCs, local government and private citizens. Five members of the CTB and one member of the VAB attended.

Comments were requested by August 31st and could be submitted at the meeting or by phone, e-mail or mail. The comment period was subsequently extended to September 30, 2004. Stakeholder input was obtained through these meetings and through solicitation of electronic comments via the *VTrans2025* website, generating a total of 233 written responses regarding the *VTrans2025* effort. (Many other comments related to the *2025 Statewide Highway Plan*, the *Public Transportation, Rail, and Travel Demand Management Needs Assessment*, or other modal plan were also received.) Of the 233 *VTrans2025*-specific responses, 138 were either written comments solicited at the public meetings or original e-mails sent to VDOT. The remaining 95 were identified to be adaptations of "form letters" that were initiated by a third party (e.g., advocacy group) and sent again by individuals.

General comments included:

- Study alternative land use scenarios that reduce land consumption, automobile travel, and the need for highways.
- One of the most important priorities should be protecting Virginia's natural resources.
- Reconnect Virginia with improved passenger and freight rail networks.
- Place priority in spending on transit, pedestrian and bicycle networks.
- If *VTrans2025* is to be successful, it needs to address the existing barriers to implementation and provide practical solutions.
- Any plan, process or agency is only as good as the quality of the people involved in its execution.
- Need to emphasize the fact that Virginians consider threats to safety, the environment and their quality of life as more important than promises of transportation improvements.
- More proactively discuss possible funding solutions.
- Legislate multimodal planning under the Secretary.
- Establish a permanent multimodal board.
- Congestion is the direct result of government's failure to build what has been planned.
- Actual benefits/cost effectiveness of new technologies has yet to be fully quantified.
- The report takes several steps in the right direction. We applaud your multimodal vision and desire to create a more integrated planning process.
- The concept of the MIN is a very good one.
- There should be continuing emphasis in the vision and throughout the document on decision-making based on efficient movement of people and goods, not vehicles.
- *VTrans2025* is definitely needed.
- There must be better public transportation to encourage less driving of private vehicles.
- Mass transit, be it air, rail or high-speed ferry is the best, cheapest, and future-friendly answer to the problem of moving people.

- Seriously consider funding highway transportation expansion by private sector and tolls.
- It is good to see all transportation agencies working together – not independently.
- The multimodal concept for planning looks promising and should work better than previous methods of planning.

Land use planning was the most common issue among the 233 responses, with almost 70 percent of all respondents (47 percent of original responses and 100 percent of form letters) stating a concern about this subject. Land use planning concerns centered on the environmental impact of increased road build-out and the social consequences of suburban sprawl. Over half of all responses indicated a desire for increased public transit (almost 30 percent of original responses and almost 96 percent of form letters) and increased bicycle/pedestrian travel opportunities (more than 20 percent of original responses and almost 94 percent of form letters). More than 25 percent of all responses (more than 40 percent of original responses and only 5 percent of for letters) recommended increased railway use and 20 percent (nearly 25 percent of original responses and nearly 14 percent of form letters) explicitly opposed road widening as a solution to increasing transportation capacity. Other stakeholder issues included opposition to specific projects (seven percent of all comments) and concerns about the effectiveness of the MIN definition or the *VTrans2025* process (six percent of all comments).

Public involvement in developing *VTrans2025* was another major issue of respondents, with more than 36 percent of respondents (more than 14 percent of original responses and 68 percent of form letters) expressing interest in obtaining greater stakeholder input.

In response to concerns expressed about the public involvement process, the public comment period was extended an additional 30 days. Numerous changes were made to the draft report to reflect comments received during the comment period. VDOT's *2025 Statewide Highway Plan* and DRPT's *Public Transportation, Rail, and Travel Demand Management Needs Assessment* were also revised to reflect the input received.

Other Phase 3 Activities

As in Phases 1 and 2, agency staff was available for informational presentations and discussion of issues related to *VTrans2025*. The web page continued to be a mechanism for information exchange during Phase 3.

APPENDIX C. MULTIMODAL PERFORMANCE OBJECTIVES AND MEASURES

Goal	Performance Objective	Performance Measure
Provide a safe, secure, and integrated transportation system that reflects the diverse needs throughout the Commonwealth.	Improve safety for system users and operators within the system and at mode origins/destinations.	Reduction in crashes and/or incidents
	Increase the security of the transportation system and its users.	Reduction in security breaches or loss due to theft, vandalism, or other incidents
	Provide infrastructure, facilities, and communications to meet strategic and emergency transportation needs.	Ability to meet strategic and emergency transportation needs; ability to perform in the event of an attack or natural disaster
Preserve and manage the existing transportation system through technology and more efficient operations.	Preserve transportation infrastructure to achieve the lowest lifecycle costs (most efficient maintenance cost) and prevent failure.	Reduction in long-term capital cost; critical need addressed; bridge condition (if applicable)
	Encourage access management techniques that preserve the operational integrity of existing infrastructure while ensuring appropriate access to adjacent land uses.	Consistency with local comprehensive plans, MPO plans, or other regional plans; number of access breaks
	Maximize system utilization by increasing the efficiency of existing facilities and services through use of technology and demand management techniques.	Tons of freight moved; number of people moved; ease of transition to new technology
	Maintain the effective and predictable operation of the transportation system to meet customers' expectations by using technology and demand management techniques.	Reduction time to clear non-recurring events; on-time performance of system and services; reduction in travel time variability; reduction in unexpected delay

Goal	Performance Objective	Performance Measure
	Reduce transfer time between modes.	Reduction in transfer time
Facilitate the efficient movement of people and goods, expand travel choices, and improve interconnectivity of all transportation modes.	Reduce congestion for all modes.	Reduction in VMT; level of service improvement; reduction in travel delay
	Ensure seamless connections between modes by providing networks of facilities that facilitate the journey from origin to destination and all connections between.	Number of barriers removed; number of links added; increase in the number of modal connections; number of bus turnouts, park-and-ride spaces, and bicycle/pedestrian accommodations
	Increase capacity for the movement of people and goods.	Increase in system capacity
	Improve access to major activity centers.	Number of modes serving activity center; frequency of service to activity center
	Meet basic transportation needs for special needs populations (e.g., the elderly, lower socioeconomic groups, and the disabled).	Number of mode choices provided; service to special needs populations
	Expand modal choices	Number of modes choices provided; number of alternatives to highway travel

Goal	Performance Objective	Performance Measure
Improve Virginia's economic vitality and facilitate the coordination of transportation, land use, and economic development planning activities.	Improve accessibility of the workforce to employment opportunities.	Number of mode choices; proximity of service or facility to desired destination, unemployment rate
	Improve accessibility of goods to markets.	Number of modes serving market; travel time; travel cost
	Improve accessibility of people to goods and services (including recreation, tourism, cultural resources, and markets).	Number of mode choices; proximity of service or facility to desired destination
	Promote efficient use of current and future transportation facilities and services by coordinating transportation planning and implementation with local land use planning and economic development goals.	Consistency with local comprehensive plans, MPO plans, or other regional plans; consistency with local zoning and land uses; consistency with local economic development goals
Improve environmental quality and the quality of life for Virginians.	Maintain and improve air quality by meeting applicable air quality standards.	Projects in conformity (where applicable); reduction in pollutants
	Maintain and improve water quality by meeting applicable water quality standards.	Compliance with applicable water quality standards, including the Chesapeake Bay 2000 Agreement; reduction in pollutants
	Maintain habitat and watershed quality and connectivity.	Improvement in habitat or watershed condition

Goal	Performance Objective	Performance Measure
	Preserve Virginia's rich cultural and historic resources.	Number of resources protected and/or enhanced
	Ensure that transportation facilities and services are compatible with the communities and destinations they serve.	Consistency with community and/or destination
Improve program delivery.	Maximize use of non-state funds (e.g., federal, PPTA, tolls).	Percentage of non-state funds; funding availability
	Maximize the system benefit of investments.	Level of investment risk; number of purposes project serves (needs addressed); anticipated return on investment
	Minimize long-term maintenance costs (i.e., life-cycle cost).	Anticipated life-cycle costs
	Leverage opportunities between modes	Number of modes supported; reliance on another mode/project
	Coordinate completion/implementation schedules and funding of interdependent multimodal projects.	Alignment of schedules and funding; project readiness

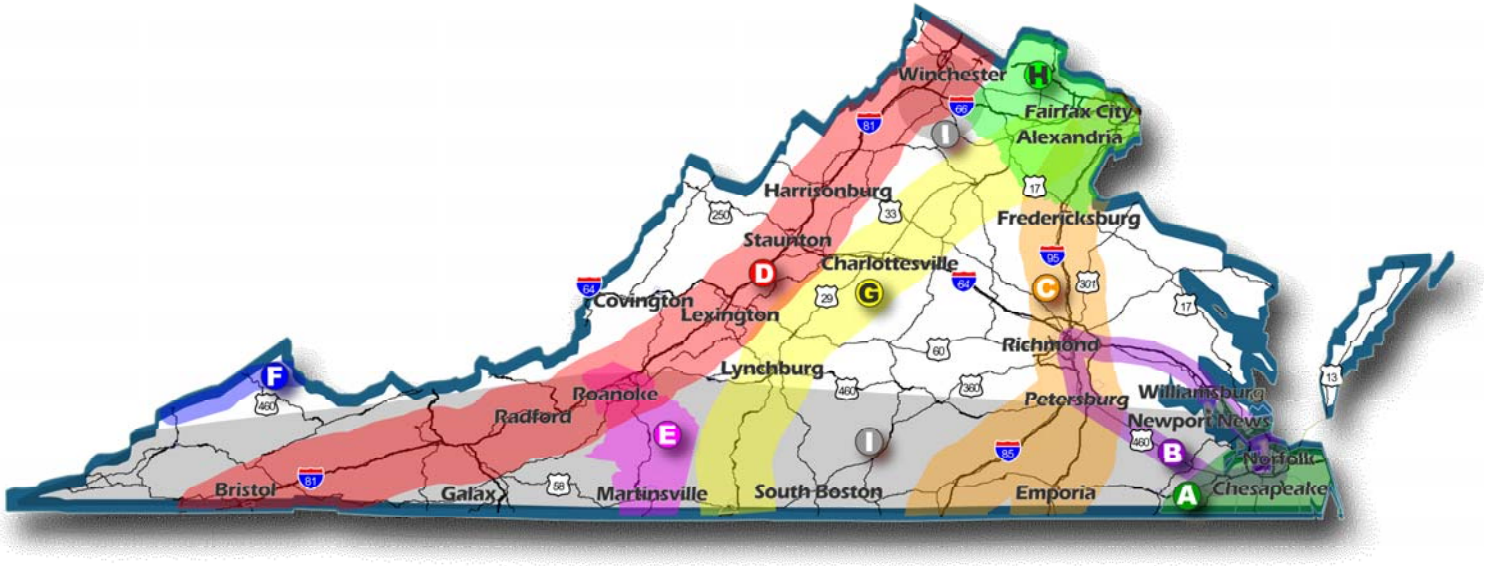
APPENDIX D. ILLUSTRATIVE MULTIMODAL INVESTMENT NETWORKS

What follows is an illustrative list of MINs. Subsequent statewide multimodal long-range transportation plans are expected to include a complete list of MINs once the necessary institutional infrastructure is in place. Ultimately, due to their expansive size and scope, only several dozen MINs are expected to be under consideration at any given time. The list will be an evolving list, with the identification and prioritization process occurring with updates to the statewide long-range multimodal plan. Each mode will adopt their own objective criteria; they will reflect the common goals and objectives of *VTrans2025*. The following eleven illustrative MINs are identified in no particular order or priority:

- Hampton Roads Multimodal Access MIN
- Richmond to Hampton Roads Passenger Mobility MIN
- Interstate 95 Passenger and Goods Movement MIN
- Interstate 81 Passenger and Goods Movement MIN
- Interstate 73 Corridor/ Franklin County Airport Access MIN
- Coalfields Access MIN
- Route 29 MIN
- Northern Virginia Connections MIN
- Port Accessibility and Mobility MIN
- Virginia Bicycle and Pedestrian System MIN
- Emergency Transportation MIN

Figure 34 illustrates the 11 illustrative MINs across the state; individual MINs are described in more detail on the following pages.

FIGURE 34. ILLUSTRATIVE MINS



A. Hampton Roads Multimodal Access MIN
B. Richmond to Hampton Roads Passenger and Goods Movement MIN
C. Interstate 95 Passenger and Goods Movement MIN
D. Interstate 81 Passenger and Goods Movement MIN
E. Interstate 73 Corridor/ Franklin County Airport Access MIN
F. Coalfields Access MIN
G. Route 29 MIN
H. Northern Virginia Connections MIN
I. Port Accessibility and Mobility MIN
J. Virginia Bicycle and Pedestrian System MIN
K. Emergency Transportation MIN

A) Hampton Roads Multimodal Access MIN

- **Construct a Third Crossing from Interstate 564 in Norfolk to Interstate 664 in Newport News.**
- Improve Interstate 664 from Bowers Hill to Interstate 64 in Hampton.
- Construct HOV lanes on Interstate 64 and Interstate 664.
- Implement safety and capacity improvements to the Mid-Town Tunnel.
- Provide a third tube for an alternate mode, to be determined.
- Support development of the Richmond to Hampton Roads High-Speed Passenger Rail Tier 1 Environmental Impact Statement recommendations for the Interstate 64 and Route 460 corridors.
- Improve access to freight and intermodal facilities throughout the corridor.
- Implement ITS (including aviation navigational aid systems) throughout the corridor, as appropriate.
- Improve ground transportation access to general aviation airports throughout the corridor, specifically the Chesapeake Airport.
- Improve access to recreation and tourism resources throughout the corridor.

B) Richmond to Hampton Roads Passenger and Goods Movement MIN

- **Implement safety and capacity improvements along Route 460 from Richmond to Hampton Roads.**
- **Implement safety and capacity improvements along Interstate 64 from Richmond to Hampton Roads.**
- Extend HOV lanes on Interstate 64 to Route 199 in York.
- Provide Park-and-Ride Lots to facilitate ridesharing and transit throughout the corridor.
- Support development of the Richmond to Hampton Roads Passenger Rail Tier 1 Environmental Impact Statement recommendations for the Interstate 64 and Route 460 corridors.
- Support improvements for the Jamestown 2007 celebration.
- Enhance safety, reduce congestion, and improve access to the Hampton Roads Airport along Route 58/460.
- Improve ground transportation access to commercial and general aviation airports, specifically, the Richmond, Newport News, and Hampton Roads Airports.
- Implement ITS (including aviation navigational aid systems) throughout the corridor, as appropriate.
- Improve access to recreation and tourism resources.

C) Interstate 95 Passenger and Goods Movement MIN

- **Implement safety and capacity improvements along the Interstate 95 corridor from North Carolina to Washington DC.**
- Extend HOV lanes along Interstate 95 from Fredericksburg to Dumfries.
- Provide Park-and-Ride Lots to facilitate ridesharing and transit throughout the corridor.
- Facilitate Southeast High Speed Passenger Rail service from North Carolina (Charlotte) to Washington DC.
- Upgrade rail lines in the entire corridor to a three-track system to improve freight rail movement where CSX, Amtrak, and VRE all share the same rails, and to permit operation of higher speed (90 mph) passenger trains.
- Increase freight rail capacity and speed by improving tracks, signals, sidings, bridges, clearances, curves, switches, and grade crossings.
- Implement ITS (including aviation navigational aid systems) throughout the corridor, as appropriate.
- Improve ground transportation access to general aviation airports.
- Improve access to recreation and tourism resources.

D) Interstate 81 Passenger and Goods Movement MIN

- **Implement safety and capacity improvements along the Interstate 81 corridor from Winchester to Bristol.**
- Upgrade and expand Interstate 81 rest area capacity for trucks.
- Increase freight and passenger rail capacity and speed by improving tracks, signals, sidings, bridges, clearances, curves, switches, and grade crossings.
- Provide train stations, parking facilities, and improved highway access to passenger rail services.
- Construct a new general aviation community airport in Lexington/Rockbridge County with convenient access to Interstate 81.
- Improve safety and capacity at Interstate 81 connections serving current and future inland ports (e.g., Front Royal).
- Implement ITS (including aviation navigational aid systems) throughout the corridor, as appropriate.
- Improve ground transportation access to general aviation airports.
- Improve access to recreation and tourism resources.

E) Interstate 73 Corridor/ Franklin County Airport Access MIN

- **Complete construction of Interstate 73 from North Carolina to Interstate 581 in Roanoke.**
- **Construct a new general aviation regional airport in Franklin County.**
- Provide direct access to the new Franklin County Airport from new Interstate 73.
- Improve accessibility to the Roanoke Airport.
- Implement ITS (including aviation navigational aid systems) throughout the corridor, as appropriate.

F) Coalfields Access MIN

- **Complete construction of the Coalfields Expressway, as a limited access facility, from Wise County to West Virginia.**
- Build a new general aviation regional airport to serve Dickenson, Buchanan, and Russell Counties with convenient access to the new Coalfields Expressway.
- Expand and improve transportation access to new and existing commercial sites.
- Implement ITS (including aviation navigational aid systems) throughout the corridor, as appropriate.

G) Route 29 MIN

- **Implement safety, capacity, and access management improvements along Route 29 from Danville to Interstate 66.**
- Improve passenger rail facilities and services from Lynchburg to Manassas.
- Improve freight rail facilities and services from North Carolina to Manassas.
- Implement ITS (including aviation navigational aid systems) throughout the corridor, as appropriate.
- Improve ground transportation access to general aviation airports.

H) Northern Virginia Connections MIN

- **Provide ground transportation connections to and from Stafford, Manassas, Leesburg, National, and Dulles airports.**
- Provide Park-and-Ride lots to facilitate ridesharing and transit, as appropriate.
- Provide shuttle service from the Manassas Airport terminal building to the VRE station located on airport property.
- Replace and expand equipment to meet increased demand on VRE.
- Address aging equipment and facilities through the WMATA Capital Replacement Program.
- Extend metro rail service from Falls Church through Tysons Corner to Dulles Airport.
- Implement safety and capacity improvements along Route 28 and Route 234.
- Improve intercity freight and passenger rail services.
- Implement ITS (including aviation navigational aid systems) throughout the corridor, as appropriate.
- Improve access to recreation and tourism resources.

I) Port Accessibility and Mobility MIN

- **Support efforts to modify tunnels along the Heartland Corridor to provide access to double-stacked trains and improve access to the Port of Virginia.**
- Construct grade separations for major rail/highway crossings for primary rail lines serving the Port of Virginia.
- Complete construction of the Craney Island Marine Terminal.
- Deepen the Hampton Roads Channel to 55 feet to support import/export of coal.
- Construct the Craney Island Connector from the new Third Crossing to Route 164.
- Construct the Intermodal Connector from Interstate 564 to NIT.
- Construct the Terminal Boulevard grade separation.

- Implement safety, capacity, and access management improvements along Route 58.
- Collaborate with communities along Route 460 to establish a Distribution Center Park with rail and highway access.
- Improve port connections for rail corridors serving the ports.
- Maintain the operational efficiency of river channels that access Virginia ports.
- Improve intermodal access to marine terminals by developing the Commonwealth Railroad branch line.
- Construct rail intermodal facilities at Suffolk.

J) Virginia Bicycle and Pedestrian System MIN

- Construct the Virginia Capital Trail from Richmond to Williamsburg to support transportation and economic development along the Route 5 corridor.
- Repair and replace signage along Interstate Bicycle Routes 1 and 76 and evaluate potential routing changes.
- Expand bicycle and pedestrian networks and provide missing connections within existing networks.
- Provide bicycle and pedestrian accommodations to connect bicycling and walking trip generators.
- Provide bicycle and pedestrian access to public transportation services and facilities.
- Construct bicycle and pedestrian accommodations to traverse natural or man-made barriers, including access-controlled barriers.
- Support Safe Routes to School programs through provision of bicycle and pedestrian accommodations.
- Install appropriate signage to facilitate the safe use of bicycle and pedestrian accommodations.
- Provide bicycle and pedestrian accommodations along existing or planned tourism corridors.
- Provide safety and connectivity for trails that intersect with the highway system, such as the Appalachian Trail.
- Promote development of long distance bicycling and walking routes, such as the East Coast Greenway.

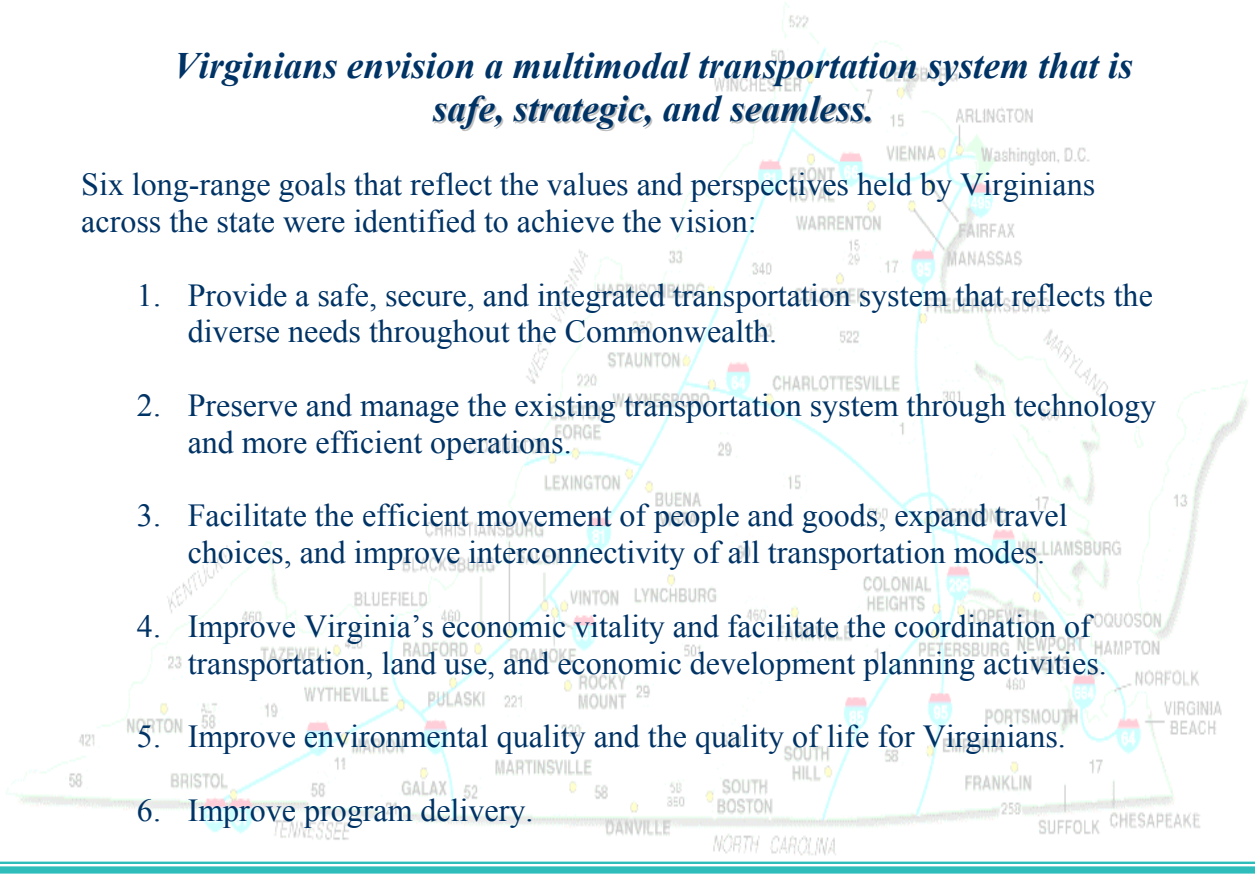
K) Emergency Management MIN

- Implement ITS (including aviation navigational aid systems) throughout the state, as appropriate.
- Upgrade traffic surveillance and congestion management systems on interstate highways and expressways.
- Implement capacity and safety improvements, as appropriate, statewide (specifically, Route 13 Chesapeake Bay Bridge Tunnel and emergency ferry service, Route 460, Interstate 95, and Interstate 64).
- Improve multimodal access to and from major activity centers and transportation facilities.
- Upgrade security at critical transportation facilities.
- Facilitate coordination among military, public, private, and other emergency responders.

Virginians envision a multimodal transportation system that is safe, strategic, and seamless.

Six long-range goals that reflect the values and perspectives held by Virginians across the state were identified to achieve the vision:

1. Provide a safe, secure, and integrated transportation system that reflects the diverse needs throughout the Commonwealth.
2. Preserve and manage the existing transportation system through technology and more efficient operations.
3. Facilitate the efficient movement of people and goods, expand travel choices, and improve interconnectivity of all transportation modes.
4. Improve Virginia's economic vitality and facilitate the coordination of transportation, land use, and economic development planning activities.
5. Improve environmental quality and the quality of life for Virginians.
6. Improve program delivery.



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