2034 Long-Range Transportation Plan

January 2012

Navigating the Future

HAMPTON ROADS TPO
TRANSPORTATION PLANNING ORGANIZATION

T12-02

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HAMPTON ROADS TRANSPORTATION PLANNING ORGANIZATION

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FREIGHT TRANSPORTATION ADVISORY COMMITTEE
William Bell, Co-Chair Vacant, Co-Chair

MILITARY LIAISONS
Mary Jackson, Captain, U.S. Navy
Mark S. Ogle, Captain, U.S. Coast Guard

HRTPO & HRPDC PROJECT STAFF

Camelia Ravanbakht, Ph.D.	Deputy Executive Director, HRTPO	Greg Grootendorst, AICP	Chief Economist
Pavithra Parthasarathi, Ph.D., P.E.	Principal Transportation Engineer	James Clary	Economist
Dale M. Stith, AICP	Transportation Planner	Jimontanae McBride	Principal Regional Planner
Benito O. Pérez, AICP	Transportation Engineer	Sara Kidd, GISP	Senior Environmental Planner
Robert B. Case, P.E.	Principal Transportation Engineer	Benjamin McFarlane, AICP	Physical and Environmental Planner
Keith Nichols, P.E.	Senior Transportation Engineer	Whitney Katchmark, P.E.	Principal Water Resources Planner
Samuel S. Belfield	Senior Transportation Engineer	Jenny Tribo	Senior Water Resources Planner
Stephanie L. Shealey	Transportation Engineer	John Sadler	Regional UASI Planner
Mike Kimbrel	Principal Transportation Engineer	Natalie Easterday, CFM	Regional Emergency Management Planner
Jessica M. Banks, AICP	Senior Transportation Analyst	Michael Long	Assistant General Service Manager
Kendall L. Miller	Public Involvement & Community Outreach Administrator	Kathlene Grauberger	Administrative Assistant II
		Brian Miller	Communications Designer
Brian Chenault	Community Outreach Planner	Christopher Vaigneur	Reprographics Coordinator

Hampton Roads
2034 Long-Range Transportation Plan

Prepared by:

January 2012

T12-02

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TITLE:
Hampton Roads 2034 Long-Range Transportation Plan

LRTP AUTHORS:
Dale M. Stith, AICP
Benito O. Pérez, AICP

OTHER CONTRIBUTING AUTHORS:
Robert B. Case, P.E.
Keith Nichols, P.E.
Samuel S. Belfield
Stephanie L. Shealey
Jessica M. Banks, AICP
Kendall L. Miller
Greg Grootendorst, AICP
James Clary
Jimontanae McBride
Benjamin McFarlane, AICP

PROJECT MANAGER:
Pavithra Parthasarathi, Ph.D., P.E.

ABSTRACT
This document is the HRTPO Policy Board's approved 20-year regional Long-Range Transportation Plan. The development of the financially-constrained 2034 LRTP has been based on a collaborative process involving many regional stakeholders and the public to identify, prioritize, and seek transportation funding for needed investments. This document identifies the transportation projects planned to be in place in the year 2034 in Hampton Roads and records the process through which the LRTP was developed.

Furthermore, this document allows the reader to weigh the assumptions, analyses, and procedures used during plan development and thereby judge the validity of the 2034 LRTP.

REPORT DATE:
January 2012

GRANT/SPONSORING AGENCY:
FHWA/VDOT/DRPT/LOCAL FUNDS

ORGANIZATION NAME, ADDRESS, & TELEPHONE
Hampton Roads Transportation Planning Organization
723 Woodlake Drive
Chesapeake, Virginia 23320
757.420.8300
http://www.hrtpo.org

ACKNOWLEDGMENTS
This report was prepared by the Hampton Roads Transportation Planning Organization (HRTPO) in cooperation with the U.S. Department of Transportation (USDOT), the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Virginia Department of Transportation (VDOT), the Virginia Department of Rail and Public Transportation (DRPT), and the local jurisdictions and transit agencies within the Hampton Roads metropolitan planning area. The contents of this report reflect the views of the HRTPO. The HRTPO staff is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the FHWA, FTA, VDOT, or DRPT. This report does not constitute a standard, specification, or regulation. FHWA, FTA, VDOT, or DRPT acceptance of this report as evidence of fulfillment of the objectives of this task does not constitute endorsement/approval of the need for any recommended improvements nor does it constitute approval of their location and design or a commitment to fund any such improvements. Additional project level environmental impact assessments and/or studies of alternatives may be necessary.

HAMPTON ROADS TPO
TRANSPORTATION PLANNING ORGANIZATION

HAMPTON ROADS TRANSPORTATION PLANNING ORGANIZATION
BOARD RESOLUTION 2012-01

A RESOLUTION OF THE HAMPTON ROADS TRANSPORTATION PLANNING ORGANIZATION APPROVING AND ADOPTING THE FISCALLY-CONSTRAINED HAMPTON ROADS 2034 LONG-RANGE TRANSPORTATION PLAN.

WHEREAS, the Hampton Roads Transportation Planning Organization (HRTPO), designated by the Governor of the Commonwealth of Virginia as the metropolitan planning organization responsible for the urban transportation planning and programming process of the Hampton Roads Metropolitan Planning Area, which includes the cities of Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg; the counties of Isle of Wight, James City, and York; and a portion of Gloucester County; in accordance with Section 450, Title 23, United States Code (23 USC 450) and applicable federal and state regulations;

WHEREAS, 23 USC 450 further requires that the urban transportation planning process shall include the development of a fiscally-constrained long-range transportation plan, which shall identify transportation facilities that should function as an integrated metropolitan transportation system, giving emphasis to those facilities that serve important regional transportation functions;

WHEREAS, the HRTPO, in partnership with HRTPO Board advisory committees and stakeholders including local, state, federal, transit, military, freight, and the public, developed the fiscally-constrained Hampton Roads 2034 LRTP which has been based on a collaborative process to identify, prioritize, and seek transportation funding for needed long-term investments in order to address the region's transportation and associated challenges;

WHEREAS, HRTPO provided the public early and continuous opportunities for public participation throughout the four-year development of the Hampton Roads 2034 LRTP;

WHEREAS, the Federal Highway Administration and Federal Transit Administration have found that the Transportation Conformity Analysis final report of the Hampton Roads 2034 LRTP demonstrates conformity as prescribed by the United States Environmental Protection Agency Transportation Conformity Rule; and

WHEREAS, the Hampton Roads 2034 LRTP fully complies with the requirements of 23 USC 450.

NOW, THEREFORE, BE IT RESOLVED that the Hampton Roads Transportation Planning Organization approves and adopts the Hampton Roads 2034 Long-Range Transportation Plan.

APPROVED and ADOPTED by the Hampton Roads Transportation Planning Organization Board at its meeting on the 19th day of January, 2012.

Molly J. Ward
Chair
Hampton Roads Transportation
Planning Organization

Dwight L. Farmer
Executive Director/Secretary
Hampton Roads Transportation
Planning Organization

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Executive Summary

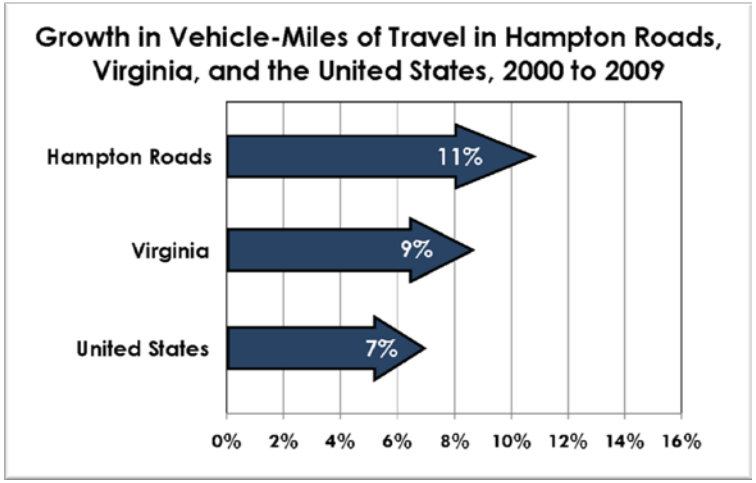
Transportation has a direct and personal effect on each and every resident of Hampton Roads. Even if you do not drive, all the goods and services you depend on, including emergency services such as police, fire, and medical transport rely on the region's roadway system. The Long-Range Transportation Plan, or LRTP, is the document that identifies and plans for critically important transportation improvements that impact the region's economic vitality and every citizen's quality of life.

The Hampton Roads Transportation Planning Organization, in partnership with local, state, federal, military, freight, transit, and citizen stakeholders, has drafted the 2034 LRTP, the transportation blueprint for the region for the next 20 years. These key stakeholders actively worked together to identify, prioritize, and seek transportation funding in order to develop a long-term investment framework for addressing the region's transportation and associated challenges.

Current State of Transportation in the Region

The total amount of roadway usage in Hampton Roads, measured in terms of vehicle-miles of travel (VMT), was just over 40 million miles each day in 2009. Between 2000 and 2009, the total amount of roadway travel in Hampton Roads increased by nearly 4 million miles per day, or a total of about 11 percent. This is higher than the growth experienced both throughout Virginia (9 percent) and the United States (7 percent). However, most of the growth in roadway travel occurred early in the decade; therefore, the VMT in Hampton Roads has remained steady between 2003 and 2009.

Figure ES.1 – Growth in VMT



Roadway congestion in Hampton Roads is some of the worst in the country This roadway congestion not only lowers the quality of life in Hampton Roads but also impacts regional commerce, particularly in those critical sectors that depend heavily on the regional transportation network such as freight movement, tourism, and the military.

The Shape and Pattern of Future Growth

Population has grown in Hampton Roads over the past decade. Looking towards 2034, the population is expected to increase by 400,000 persons, resulting in a regional community of over two million residents. This translates into approximately 770,000 households for Hampton Roads in 2034.

Employment in Hampton Roads is expected to increase as well. According to the 2034 socioeconomic forecast, Hampton Roads is expected to have slightly more than 1.2 million jobs in the region.

Framing the LRTP

The development of the 2034 LRTP was a transparent process in which HRTPO staff provided broad-based access to all LRTP related material. This included utilizing the World Wide Web, direct and electronic mail, providing public comment opportunities and draft versions of the LRTP in regional libraries, conducting outreach and partnering with community organizations and existing events, as well as holding public meetings, community events, and dialogues across the region to share information and gain public input on the LRTP.

Vision and Goals

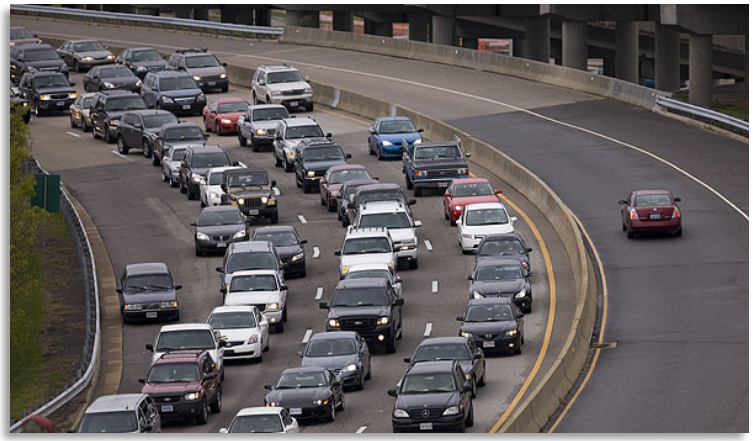
The vision of the 2034 LRTP is to provide a safe, efficient, sustainable, and balanced multimodal transportation system for all users. To achieve this vision, thirteen goals were developed to serve as a foundation in which to formulate transportation investment strategies and projects. These goals were drafted based on public input and refined by the goals and priorities as outlined by federal and state guidelines.

Transportation Challenges and Strategies

Hampton Roads includes an intricate system of roads, bridges, tunnels, and ferries which provide much needed connections on both sides of the water. The same features that provide Hampton Roads with a multitude of economic and recreational advantages also produce geographical challenges for creating and maintaining the transportation infrastructure. The region's location and topography require many bridges and tunnels, requiring higher costs for construction and maintenance. The combination of these factors creates special challenges in developing a safe, efficient, and well maintained regional transportation system.

Table ES.1 – 2034 LRTP Goals

2034 LRTP Goals
Supports the economic vitality of the metropolitan area, enabling global competitiveness, productivity, and efficiency
Increase the safety of the transportation system for motorized and non-motorized users
Provide for the security of the region's transportation infrastructure and its users
Protect and enhance the environment, promote energy conservation, improve the quality of life, and reduce greenhouse gas emissions
Obtain compatibility between transportation improvements and planned land use and economic development patterns
Increase accessibility and mobility of people and goods
Enhance the integration and connectivity of the transportation system, across and between modes, for people and goods
Optimize the efficient system management and operation of the regional transportation system
Increase the optimization, maintenance, and replacement of the existing transportation system
Enhance public involvement in the development of the region's transportation system
Include a regional perspective among the transportation prioritization criteria
Develop a long-range transportation plan that is fiscally constrained
Work toward finding dedicated and sustainable revenue sources for transportation



Mobility and Accessibility

Mobility and accessibility challenges vary depending on the user's viewpoint. For example, the challenges faced by special needs populations (elderly, medical/functional needs persons, zero-vehicle households, youth) differ quite a bit from the military or freight communities. As such, the LRTP must acknowledge that needs differ among various users and hence, solutions should address these differences.

Overcoming the mobility and accessibility challenges in the Hampton Roads region is a goal of the 2034 LRTP. The livelihood and quality of life of many residents is dependent on the constant improvement of the transportation system. Through collaboration at the various levels of government with citizen and business stakeholders, Hampton Roads can employ various strategies to improve mobility and accessibility for the general population as well as special needs populations, the military, and freight in the region. These strategies include congestion management, land use and transit planning, conducting special studies, and regional freight planning.

Additionally, the region must continue planning for and investing in not only the highway network, but also the non-motorized transportation network (sidewalks, bikeways, and trails) as well as rail infrastructure.

Reliability

Having a reliable transportation system is vital to a community. A strong and reliable transportation system efficiently moves goods to markets, people to work, children to school, and even consumers to the grocery store. In addition, the transportation network also provides a critical means of mobility for the region during emergencies. Therefore, it is essential to keep the network in a state of good repair.

Looking towards the future of the regional transportation network, stakeholders will have to assess the condition of existing infrastructure, how much farther the existing infrastructure's lifespan can be extended, and what investments will be needed to maintain system operations. Since Hampton Roads and Virginia must devote funds for the operation and maintenance of the existing transportation infrastructure before funding new projects, this will impact the amount of new transportation infrastructure that can be constructed.

As part of the transportation planning process, the region has established strategies to promote a reliable transportation system. These strategies will be implemented to manage and alleviate regional congestion, assess the structural soundness of infrastructure, and ensure a secure network for the movement of people and goods. These strategies include: system preservation, infrastructure monitoring (including bridges and tunnels), and system management.

Environmental

Hampton Roads is home to many natural resources, including woodlands, wetlands, rivers, and shorelines. These resources provide both economic and environmental benefits as tourist attractions, recreational areas for residents, and habitat for wildlife and marine life. Protecting and preserving these resources while balancing them with growth is a key strategy for promoting sustainable regional growth and development.

Challenges that Hampton Roads will face in protecting these resources include: maintaining water and air quality, protecting sensitive areas, and adjusting to the impacts of climate change on the region. These issues will place particular stress on the planning, construction, maintenance, and operation of transportation infrastructure and services in the region.

In order to minimize impacts to natural resources in Hampton Roads, it is essential for the region to have effective mitigation strategies in place. Through collaboration with local, regional, state, and federal partners, Hampton Roads can outline policies and allocate resources to help protect the environment and improve the quality of life in Hampton Roads.

The key challenge moving forward will be to better integrate land use and transportation planning. New federal programs and policies are now strongly encouraging multidisciplinary and coordinated approaches to development. This improved integrated planning will help maximize benefits of development while minimizing the negative impacts to the region's natural and financial resources.

Financial

As with the rest of the nation, the Hampton Roads region has experienced major impacts from the December 2007 recession, including a struggling housing market, increased foreclosures, high gasoline prices, and increased regional unemployment.

This economic strain has compounded the already present shortfalls in transportation funding. Limited traditional transportation revenue, the uncertainty of a dedicated transportation funding stream at the national level, and the lack of said stream at the state level have resulted in a bleak financial forecast for transportation.

Recognizing that funding transportation is one of the key challenges facing the Commonwealth, Governor Bob McDonnell announced a plan in early 2011 to invest billions of dollars in the Commonwealth's transportation system over the next three years without raising taxes.

In addition to the Governor's Omnibus Transportation Funding Package, the HRTPO has investigated the application of other non-traditional funding sources in order to advance projects, including: local funding, tolls, and Public-Private Partnerships

Project Prioritization

A strategy used by the HRTPO to advance regional transportation investments with scarce financial resources is the *Program Priorities Prioritization Methodology* (Project Prioritization Tool). The Project Prioritization Tool prioritizes candidate regional transportation projects based on their technical merits and regional benefits in light of scarce financial resources.

The Regional Transportation Plan

All LRTPs must be fiscally-constrained, meaning all projects must have funding identified to cover the costs associated with the projects. The financial plan identifies how much money is reasonably available to help preserve our transportation system and support additional investments over the next 20 years to keep people and goods moving as efficiently as possible.

Economic Forecast

Based on VDOT's most current information regarding traditional revenues, the region can expect approximately $13.6 billion in funding for maintenance and construction of the transportation system over the next 20 years. Since maintaining existing roadways is a Federal and State mandated priority, maintenance costs must first be accounted for before new transportation projects can be considered. Assuming that current trends for maintenance funding continue, maintenance of the region's transportation system will consume a majority of the anticipated traditional revenues – approximately 90 percent.

Non-traditional revenues identified for the 2034 LRTP include local revenues (funds from localities), tolls, public-private partnerships, and special government earmarks.

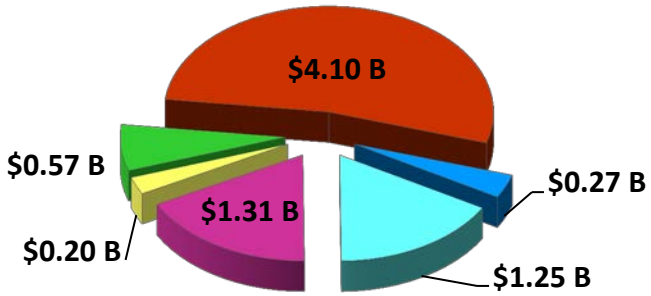
Projects with associated tolls and P3 funds include:

- Downtown Tunnel/Midtown Tunnel/MLK Extension
- Dominion Boulevard
- US Route 460

Total Revenues for the 2034 LRTP

Combining traditional revenue sources, local revenues, projected tolling and private investment, and the Governor's Omnibus Transportation Funding Package, Hampton Roads can expect more than $7 billion in the next 20 years (2012-2034) to invest in new transportation projects for the 2034 LRTP.

Figure ES.2 – Sources of Estimated Revenues (2012-2034)



	Traditional (Federal and State) Funding for Construction	$1.25 B
	Local Funding	$1.31 B
	Virginia Port Authority Contribution	$0.20 B
	Governor's Omnibus Transportation Funding Package	$0.57 B
	Public-Private Partnerships (P3)	$4.10 B
	Private Tolls	$0.27 B
	Total Revenues for New Construction Projects	**$7.70 B**

Selecting Projects for the 2034 LRTP

The list of 150 candidate transportation projects for the 2034 LRTP was determined by both technical staff and citizen input. The candidate projects, totaling approximately $30 billion include: increasing roadway capacity, expanding bridges and tunnels, replacing aging infrastructure, improving public transportation options, and enhancing the movement of freight in and out of the region.

With an estimated total construction cost of approximately $30 billion and $7.7 billion identified to fund construction, HRTPO staff had the challenging task of evaluating and prioritizing these 150 candidate transportation projects. To narrow the list, staff first accounted for those projects automatically included in the plan (committed projects). Next, the Project Prioritization Tool was applied to the remaining projects to help evaluate and rank projects based on their technical merits and regional benefits. High-ranking projects were then selected based on funding sources available.

Table ES.2 – Summary of 2034 LRTP Candidate Transportation Projects

Project Category	Number of Projects	Estimated Construction Cost*
Highways	113	$9.4 Billion
Highway Interchanges/ Intersections	15	$1.2 Billion
Bridges and Tunnels	14	$13.4 Billion
Transit	5	$2.2 Billion
Intermodal	3	$0.7 Billion
Total	**150**	**$26.9 Billion**

*Cost estimates in Year-of-Expenditure dollars

Using the scores produced by the Project Prioritization Tool, recommendations from the HRTPO Transportation Technical Advisory Committee, the Governor's Omnibus Transportation Funding Package, and with consideration from stakeholder input (local, State, Federal, private sector, and public), the HRTPO staff developed a fiscally-constrained list of recommended regional transportation priorities for Hampton Roads.

Components of 2034 LRTP Projects

The 2034 LRTP is comprised of approximately 90 studies and construction projects. The total cost for these projects is estimated at just over $7 billion.

Studies

Several transportation studies from the current 2030 LRTP, already underway, were also included in the 2034 LRTP. The combined estimated cost for these studies is approximately $34 million.

Regionally Funded Construction Projects

Regional projects that add capacity to the transportation network must be included in the LRTP. These projects are prioritized by roadway system (Interstate, Primary, Secondary, and Urban) within each Prioritization Category. The estimated total cost for new construction projects is approximately $5.9 billion (includes candidate projects from the Governor's Transportation Funding Proposal).

Locally Funded Regional Construction Projects

In addition to the regional prioritized projects approved by the HRTPO Board, several localities allocated local funding to regionally significant projects. Since these projects add capacity to the regional network, they are also included in the 2034 LRTP. The total estimated cost for locally funded new construction projects is $1.4 billion.

Demonstrating Fiscal Constraint

For the 2034 LRTP, the costs associated with Committed Projects, Studies, Regionally Funded Construction Costs, and Locally Funded Regional Construction Projects are less than or equal to expected funding (as seen in table on following page); therefore, fiscal constraint is demonstrated.

Table ES.3 - Fiscal Constraint Summary, Fiscal Years 2012-2034 ($ Millions)

	Committed Projects	Studies	Construction Projects	Fund Balance
Interstate	$127	$7	$193	$0
Primary	$19	$7	$21	$45
Secondary	$1	$4	$0	$12
Urban	$136	$0	$7	$0
Dedicated Statewide Funds	$1	$0	$78	$1
Regional Surface Transportation Program	$10	$16	$425	$151
Local/Agency Designated Funding	$18	$1	$1,380	$119
Private Tolls	$0	$0	$273	$0
Governor's Package	$21	$0	$510	$0
Public-Private Partnerships (P3)	$0	$0	$4,100	$0
TOTAL	$333	$35	$6,987	$328

Plan Performance

The 2034 LRTP was developed to meet measurable goals, especially in areas of congestion management, environmental preservation, and equal considerations for all transportation users.

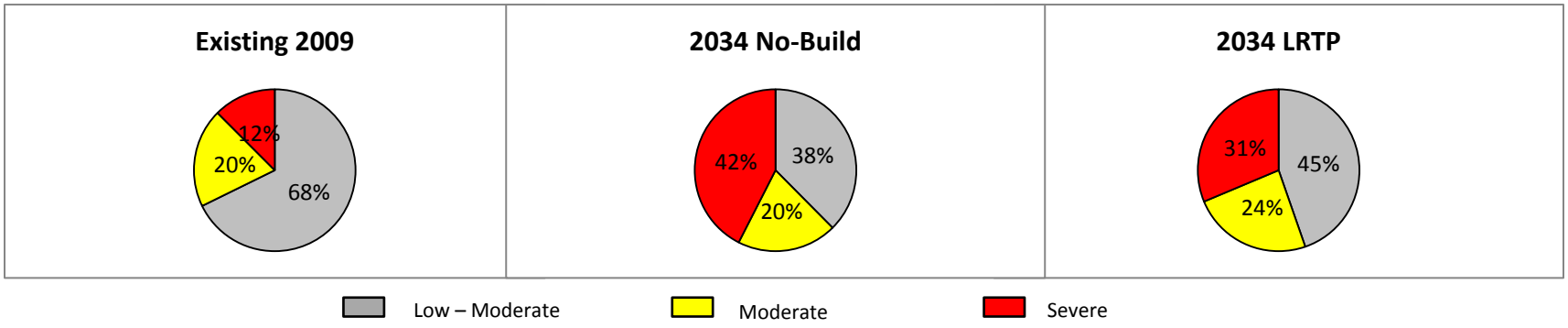
Level of Congestion

HRTPO staff analyzed the congested lane-miles for three different scenarios:

- Existing (2009)
- 2034 'No-Build' (do nothing)
- 2034 LRTP (projects identified in the 2034 LRTP)

In evaluating the results, congestion is expected to increase in 2034 largely due to the anticipated increase in regional population and employment. In comparing the 'build' and 'no-build' scenarios for 2034, results indicate that the portion of lane-miles with low to moderate congestion (LOS A through C) is expected to increase slightly by 7 percent, while the portion of lane-miles with severe congestion (LOS E through F) is expected to decrease by 11 percent. The portion of lane-miles with moderate congestion (LOS D) is expected to remain almost the same, increasing just four percent.

Figure ES.3 – 2009 and 2034 Congested Lane Miles



Air Quality Conformity

Air Quality Conformity is the link between air quality improvement and transportation planning. LRTPs must demonstrate that transportation projects within the plan do not produce pollutants that exceed regional thresholds and will not cause new air quality violations. Otherwise, the transportation projects cannot be federally funded or approved.

Conformity analysis was performed on the 2034 LRTP list of projects; results were forwarded to the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) on September, 16, 2011. A joint positive conformity finding for the 2034 LRTP was received from FHWA and FTA on December 12, 2011.

Environmental Justice Analysis

Environmental Justice (EJ), as it relates to transportation planning, combines environmental awareness with racial, ethnic, and social awareness to ensure that transportation projects do not unfairly burden populations that may experience barriers to mobility. Central to the heart of EJ is the right to a safe, healthy, productive, and sustainable environment for all communities.

The HRTPO is committed to the principles of Environmental Justice and has taken steps to better inform and include those who traditionally have been left out of the transportation planning process. During the development of the 2034 LRTP, staff applied a Four-Step framework to identify, conduct outreach, evaluate, and document EJ considerations.

Based on EJ analysis for the 2034 LRTP, HRTPO staff concludes the projects in the 2034 LRTP:

- Do not disproportionately burden EJ communities
- Provide equitable benefit of investment throughout the planning area, including EJ communities
- Planning considerations intend to distribute future benefits equitably and without consideration of race or income.

2034 Regional Transportation Vision Plan

Due to fiscal constraint issues, not all of the 150 candidate transportation projects could be incorporated into the 2034 LRTP. The remaining candidate projects become part of the Regional Transportation Vision Plan, an illustrative list of beneficial transportation projects. These projects are unfunded investments (totaling approximately $19 billion) that warrant future consideration for inclusion in an amended 2034 LRTP should additional funding be identified.

Unfunded Projects for Future Consideration

In addition to the fiscally-constrained list of projects, the HRTPO staff and the Transportation Technical Advisory Committee developed a list of regional priority projects for future consideration should additional transportation funds be identified. The projects on this list are interstate projects for which there is no current funding source identified. The total estimated cost of unfunded interstate priorities is approximately $2 billion.

Looking Ahead

The 2034 LRTP is the regional transportation plan that will guide the programming and construction of transportation investments in Hampton Roads. To help improve the transportation network of the region, projects from the LRTP will be built and/or studied, and strategies will be implemented. Additionally, because the LRTP is a dynamic transportation policy document, there are mechanisms in place to amend the plan in order to reflect changing priorities and challenges, as well as incorporate evolving needs.

SECTION 1: OVERVIEW

Introduction

Transportation has a direct and personal effect on each and every resident of Hampton Roads. Even if you do not drive, all the goods and services you depend on, including emergency services such as police, fire, and medical transport rely on the region's roadway system. The Long-Range Transportation Plan, or LRTP, is the document that identifies and plans for critically important transportation improvements that impact the region's economic vitality and every citizen's quality of life.

Regional Overview

Hampton Roads is home to more than 1.7 million residents and is projected to grow to just over two million by the year 2034. It is among the 40 largest Metropolitan Statistical Areas in the country, the sixth largest in the Southeast.

Hampton Roads is located in Southeastern Virginia at the mouth of the Chesapeake Bay. The region is divided by the James River and the Hampton Roads Harbor, one of the world's largest natural harbors, into two sub-regions: the Peninsula and the Southside.

The region contains miles of coastal beaches and has access to other waterways, making Hampton Roads a prime East Coast tourist destination. Its location and physical features enhances strategic capabilities for the area in foreign trade, military and port facilities.

Hampton Roads includes an intricate system of roads, bridges, tunnels, and ferries which provide much needed connections on both sides of the water. The same features that provide Hampton Roads with a multitude of economic and recreational advantages also produce geographical challenges for creating and maintaining the transportation infrastructure. The region's location and topography require many bridges and tunnels, requiring higher costs for construction and maintenance. The combination of these factors creates special challenges in developing a safe, efficient, and well maintained regional transportation system.

Map 1.1 – Hampton Roads

Regional Transportation Planning

Metropolitan Planning Organizations (MPOs) were established by the federal government for the purposes of providing a regional forum for transportation planning based on a region's shared vision of the future. MPOs:

- Plan the region's transportation system
- Allocate federal transportation funds
- Approve the implementation of transportation projects through a comprehensive, cooperative, and continuing transportation process

The MPO for the region is the Hampton Roads Transportation Planning Organization (HRTPO), established in 1991 as the MPO of the Peninsula and Southside[1].

Membership of the HRTPO includes elected local representatives from the region's 13 urban localities (the cities of Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, Williamsburg, and the counties of Gloucester, Isle of Wight, James City and York), state legislative members, and other interested stakeholders, such as public transportation providers, state agencies, and assorted non-voting advisory representation from citizen interests, freight, military, aviation, and federal observers.

As the region's MPO, the HRTPO is responsible for preparing key transportation planning and programming documents including the LRTP and the Transportation Improvement Program (TIP), which serves as the implementation device of the LRTP. The adoption of these documents is a prerequisite for the receipt of both federal transit and highway funding.

Five Core Functions of MPOs

- Establish and maintain a fair and impartial setting for effective regional decision making with regard to metropolitan transportation planning.
- Evaluate transportation alternatives appropriate to the region in terms of its unique needs, issues, and realistically available options.
- Develop, approve, and maintain a fiscally-constrained, Long-Range Transportation Plan – at least 20 years, for the metropolitan planning area.
- Develop, approve, and maintain a fiscally-constrained Transportation Improvement Program – short range, four-year plan, containing all transportation projects that require an action by the Federal Highway Administration or Federal Transit Administration.
- Involve the public in the four functions listed above.

HRTPO Board

[1] Prior to 1991, there were separate MPOs for the Peninsula (Peninsula MPO) and Southside (Southeastern Virginia MPO).

What is an LRTP?

The Long-Range Transportation Plan (LRTP) serves as the blueprint for the region's transportation development and identifies all regionally significant transportation projects for the Hampton Roads metropolitan area. The LRTP has a planning horizon of 20 years and is updated every four years to reflect changing conditions such as new planning priorities, population projections, economic change, and anticipated travel demand.

To update the LRTP, HRTPO staff examines how the region may develop over the next 20 years based upon projected population and employment growth. Changes in growth can impact demand on the regional transportation system, therefore future plans must consider alternatives to effectively address these needs. Once alternatives are determined, funds are identified to pay for new or widened facilities. This entire process requires regional cooperation and public participation.

Approach

The development of the 2034 LRTP is based on a collaborative process involving many regional stakeholders, including: elected officials, regional engineers and planners, representatives from the military, the Port of Virginia, the business community, and advocacy groups. These key stakeholders actively work together to identify, prioritize, and seek transportation funding for needed investments.

In addition to these stakeholders, the public also plays a key role throughout the development of the LRTP. It is the HRTPO's policy that the public has reasonable opportunity to comment on the development of the LRTP from the beginning of the process, as well as continuously throughout the development of the Plan. More information regarding specific outreach strategies during the development of the LRTP are discussed in Chapter 5.

Table 1.1

STAKEHOLDERS IN THE DEVELOPMENT OF THE 2034 LRTP	
Local Government	
Chesapeake	Poquoson
Gloucester County	Portsmouth
Hampton	Suffolk
Isle of Wight County	Virginia Beach
James City County	Williamsburg
Newport News	York County
Norfolk	
Transit Agencies	
Hampton Roads Transit	
Williamsburg Area Transit Authority	
State	
Virginia Senate	
Virginia House of Delegates	
Commonwealth Transportation Board	
Virginia Department of Transportation	
Virginia Department of Rail and Public Transportation	
Virginia Port Authority	
Virginia Department of Aviation	
Norfolk Airport Authority	
Peninsula Airport Commission	
Federal Agencies	
US Department of Transportation – FHWA, FTA, FRA	
US Environmental Protection Agency (EPA)	
Military – Navy, Air Force, Army, Coast Guard	
Other	
General Public	
Business Community	
Special Interest Groups	

LRTP Development Overview

HRTPO staff began working on the 2034 LRTP over four years ago. Developing a twenty-year transportation blueprint involves many steps, extensive data collection, analyses at different stages of plan development, and of course, coordination among stakeholders as well as public outreach to keep all interested parties informed and engaged.

Figure 1.1 – LRTP Development Overview

The first steps in the process include establishing the LRTP horizon year and developing population and employment forecasts. HRTPO staff works closely with local planners to determine where growth will occur in the region in an effort to determine future transportation needs. Regional priorities and concerns are identified, which assists in the formation of the Vision and Goals for the LRTP (discussed further in Chapter 6). Candidate projects are also collected from both local planners and the general public.

As part of the development of the 2034 LRTP, a new state-of-the-art Project Prioritization Tool was crafted to assist decision-makers in maximizing scarce transportation funding. Details regarding the Prioritization Tool will be discussed in Chapter 15.

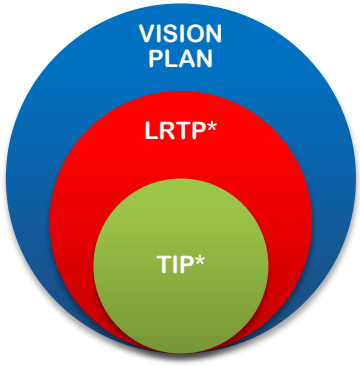
Additional steps in the process include prioritizing candidate projects and identifying transportation funding over the next twenty years. Prioritized projects are then selected based on this anticipated funding. Next, the package of transportation projects is examined to ensure that certain segments of the population are not overburdened by impacts associated with the projects. In addition, vehicle emissions are analyzed to ensure they do not exceed air quality budgets.

Once it is determined that future projects can be reasonably funded and will contribute to improving air quality, the Federal Highway Administration (FHWA) and the Federal Transit Authority (FTA) issue a joint Conformity Finding. After the Conformity Finding is issued, the HRTPO Board can adopt the LRTP as the Regional Transportation Plan.

LRTP Framework

As stated previously, one of the core functions of an MPO is to develop and maintain a fiscally-constrained LRTP. In other words, the LRTP cannot be a wish list of projects; instead, it must demonstrate that all projects identified in the constrained plan have adequate funding. **Figure 1.2** depicts the funding framework for the LRTP.

Figure 1.2: Funding Framework



***Fiscally-constrained**

The Vision Plan represents regional transportation needs in which sufficient funding has yet to be identified. Projects in this category will be considered for inclusion in the LRTP as funding becomes available.

The LRTP represents the fiscally-constrained plan. Projects identified in this group can be reasonably funded within the planning horizon of the LRTP. Each project that seeks federal funding must be included in the LRTP.

At the base of the funding framework is the Transportation Improvement Program (TIP), which represents the first four years of the LRTP, including projects ready for implementation and ongoing operations and maintenance commitments.

Relationship of Planning Activities to the LRTP

In addition to the TIP, other regional programs and processes either impact or are impacted by the LRTP, including:

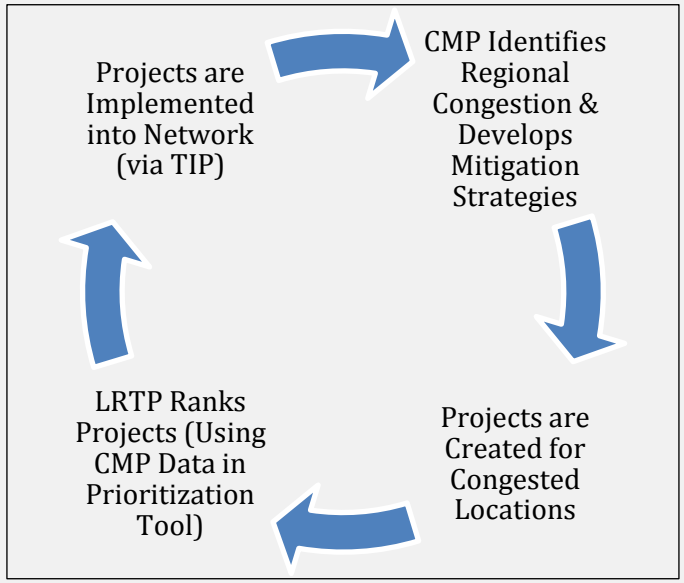
- Congestion Management Process
  - Process that identifies congested locations in the region
- Project Prioritization
  - Tool designed to objectively score candidate transportation projects
- Public Participation Plan
  - Outreach plan for informing and engaging citizens in the transportation planning process
- Regional Studies
  - Safety studies, Freight/Truck Studies, Corridor studies, Project/Scenario studies, etc.
- State Plans/Programs
  - VTrans, Six-Year Improvement Program, State Implementation Plan, etc.
- Federal Programs
  - State Transportation Improvement Program

LRTP Integration with CMP

The Congestion Management Process (CMP) for Hampton Roads is an on-going process that identifies congested locations, determines the causes of congestion, ranks the most severe segments, and develops transportation strategies to reduce traffic congestion and enhance safety and mobility region-wide. Federal regulations require that a CMP be in place in all Transportation Management Areas (TMAs), which are urban areas over 200,000 in population. The first CMP report for Hampton Roads was released in 1995, and was updated in 1997, 2001, 2005, and 2010.

Federal regulations recommend that CMPs be updated as a continuous part of the metropolitan planning process, which also includes the LRTP, the TIP, and the Unified Planning Work Program (UPWP). According to FHWA, the CMP must, at minimum, be updated often enough to provide relevant, recent information as an input to each LRTP update. Integration of all four elements (CMP, LRTP, TIP, UPWP) is a key feature of a comprehensive planning process.

Figure 1.3: Steps for Integrating CMP into the Planning Process



The CMP is the first step in addressing regional transportation issues as it monitors the regional roadway network, identifies congestion, and develops mitigation strategies (**Figure 1.3**). The CMP also includes a ranking of roadways based on current congestion and other performance measures to determine where future projects are most needed. The HRTPO encourages local planners, engineers, and decision makers to strongly consider the CMP results and mitigation strategies when developing future LRTP candidate projects. Once the LRTP candidate projects are identified, data from the CMP is input into the LRTP Project Prioritization Tool in order to assist in the selection of LRTP projects. Finally, projects from the LRTP that are ready to be implemented are included in the TIP and constructed and the process begins again.

State of Transportation in the Region

Interstate 64 near Ocean View

The roadways, tunnels, buses, trains, and ferries in Hampton Roads are utilized by a variety of users: from soldiers traveling to and from military bases, to truckers hauling containers of freight hundreds of miles inland, to tourists visiting the region for rest and relaxation. Meanwhile, the transportation network that provides the foundation for this regional activity is starting to show strain. Congestion is prevalent throughout the region, particularly at the region's critical water crossings. Infrastructure is aging, with many roadways in poor condition and bridges closed due to deteriorating conditions.

Previous LRTP

As stated in the previous chapter, MPOs are charged with updating LRTPs every four years to reflect changing conditions and priorities. The 2034 LRTP will replace the 2030 LRTP, which was approved in December 2007. The 2030 LRTP was developed to accommodate a growing population, increasing vehicle ownership, rising construction costs, and a need for innovative transportation funding. To address the growing mobility needs of the region that was estimated at over $20 billion, the 2030 LRTP included approximately 100 multimodal transportation projects. The projects, funded with a projected $12 billion LRTP budget, included a new fixed guideway transit infrastructure and various arterial and expressway capacity improvements to not only help relieve congestion but also to enhance freight mobillity.

As the region prepares to update the LRTP to the year 2034, the issues that shaped 2030 have intensified. Population continues to grow, vehicle ownership is increasing and construction costs are on the rise, resulting in estimated construction costs for regional transportation escalating to nearly $30 billion. As detailed in later chapters, the 2034 LRTP is comprised of 90 construction projects and studies with a total estimated cost of $7 billion. Although the anticipated construction costs associated with candidate transportation projects increased approximately $10 billion from 2030 to 2034, the estimated funds identified for a fiscally-constrained LRTP decreased by $5 billion. The need for innovative transportation funding is greater now than ever before.

This section reflects on the current state of the transportation network and recent mobility trends of the region in order to paint a picture of the transportation challenges faced by the region, the importance of addressing these challenges, and what has been done in the past to improve the transportation network. Much of the information in this section is also included in the HRTPO State of Transportation in Hampton Roads report.

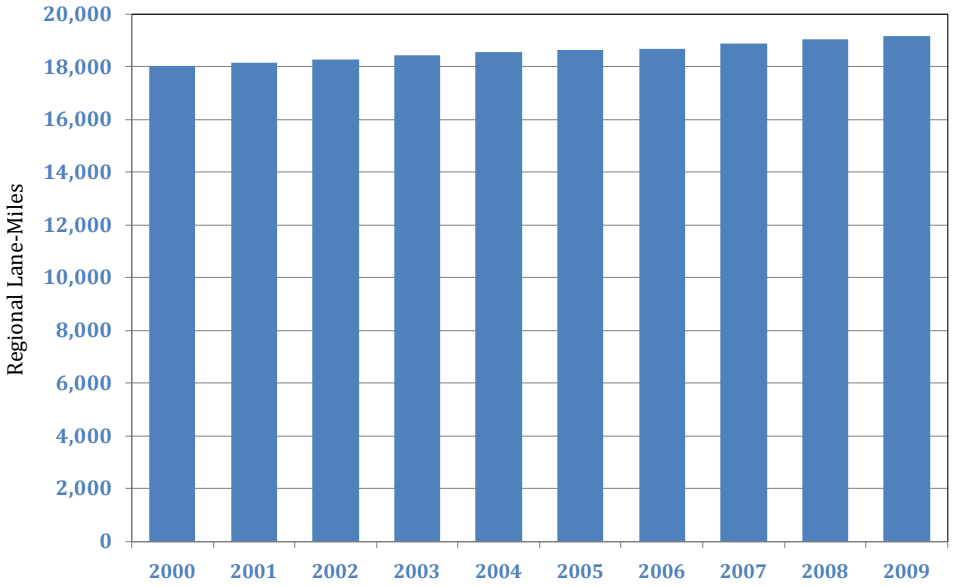
Roadway Network

The Hampton Roads roadway network is largely impacted by the topography of the region. Because of the abundance of waterways in Hampton Roads, bridges and tunnels are a critical component of the regional roadway network, and many roadways funnel into these chokepoints.

The size of the Hampton Roads roadway network has increased throughout the years. The number of lane-miles[1] in the region has risen from 18,021 in 2000 to 19,156 in 2009. This accounts for an increase of 1,135 lane-miles, or 6 percent. However, of this total growth, half was in local roadways that usually carry low traffic volumes and serve neighborhood traffic. Excluding local roadways, the amount of vehicle-miles traveled in Hampton Roads increased at three times the rate as the amount of lane-miles between 2000 and 2009.

Major roadway projects have been completed in Hampton Roads since 2000, as illustrated in **Maps 2.1** and **2.2** on the following pages (table of projects located in Appendix A). Together these 49 projects added over 225 lane-miles to the regional roadway system. Projects completed in Hampton Roads over the last ten years include the Pinners Point Interchange, portions of the Chesapeake Expressway, Route 17 in Chesapeake, and I-64 section widenings on the Southside and Peninsula.

Figure 2.1: Lane-Miles of Roadways in Hampton Roads, 2000-2009

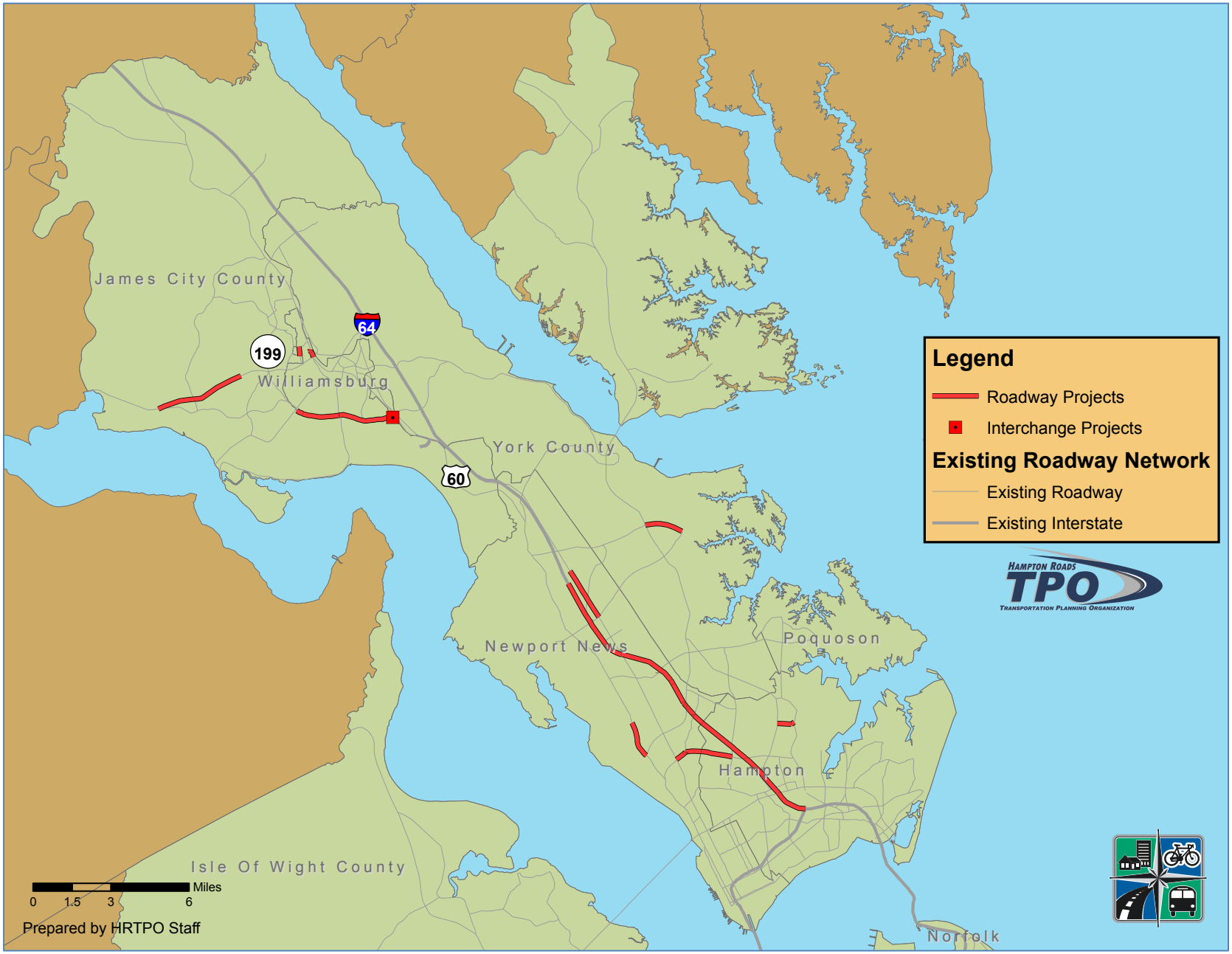


Source: VDOT.

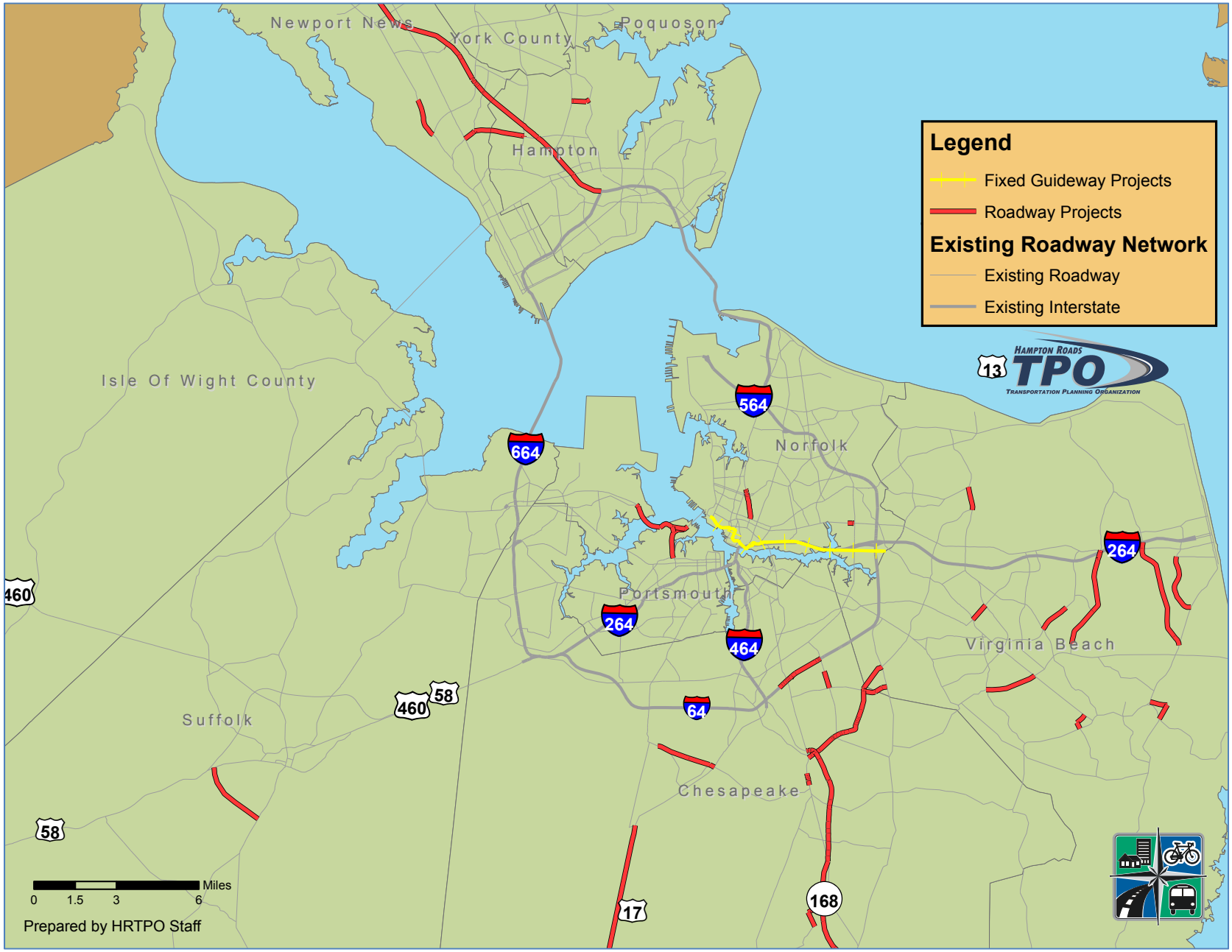

Pinners Point Interchange

[1] A lane-mile is defined as the length of a roadway segment multiplied by the number of lanes. A one-mile long, four-lane wide roadway segment would comprise four lane-miles.

Map 2.1: Major Transportation Projects Completed in Hampton Roads on the Peninsula, 2000-2011



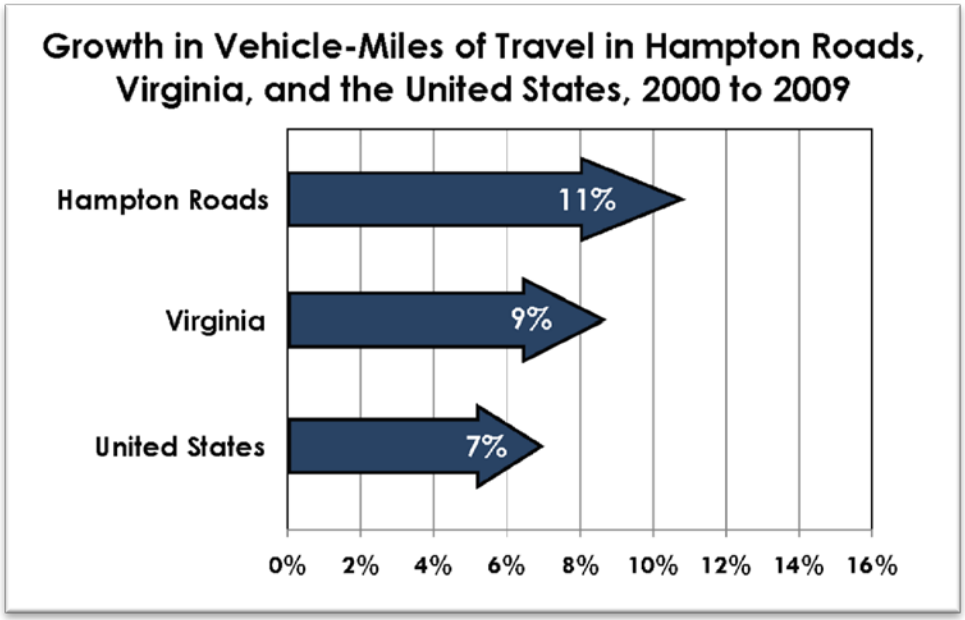
Map 2.2: Major Transportation Projects Completed in Hampton Roads on the Southside, 2000-2011



Roadway Usage

The total amount of roadway usage in Hampton Roads, measured in terms of vehicle-miles of travel (VMT), was just over 40 million miles each day in 2009. Between 2000 and 2009, the total amount of roadway travel in Hampton Roads increased by nearly 4 million miles per day, or a total of about 11 percent. This is higher than the growth experienced both throughout Virginia (9 percent) and the United States (7 percent). However, most of the growth in roadway travel occurred early in the decade; therefore, the VMT in Hampton Roads has remained steady between 2003 and 2009.

Figure 2.2: Growth in VMT



Source: VDOT.

Roadway Congestion

Roadway congestion, like in many other large metropolitan areas, is prevalent throughout Hampton Roads. This roadway congestion not only lowers the quality of life in Hampton Roads but also impacts regional commerce, particularly in those critical sectors that depend heavily on the regional transportation network such as freight movement, tourism, and the military.

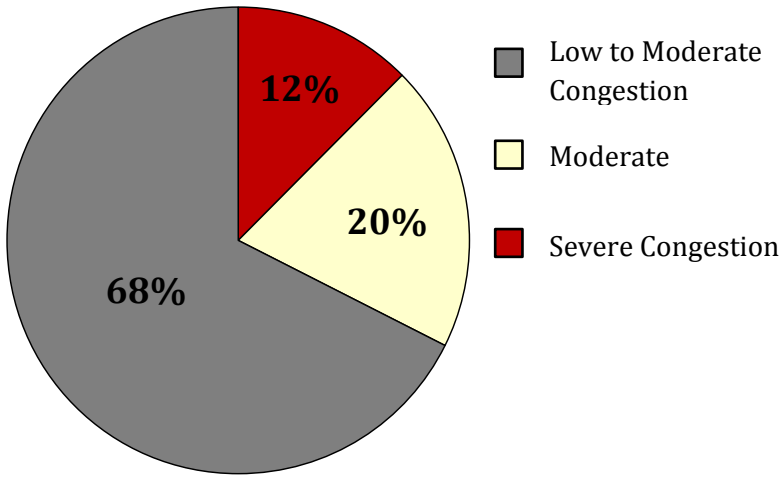
Roadway congestion in Hampton Roads is some of the worst in the country. According to a national study by Inrix, during congested peak travel periods in Hampton Roads, an average trip takes approximately 13 percent longer to complete than during uncongested periods of the day.[2] When compared to thirty-five similar large metropolitan areas with populations between one and three million people, the Inrix study reports that Hampton Roads had the 5th highest congested peak travel period in 2010, ranking Hampton Roads above many high profile metropolitan areas such as Baltimore, Denver, Pittsburgh, St. Louis, and Charlotte.


Interstate 64 Westbound, towards Bay Avenue

[2] Detailed information contained in the *State of Transportation in Hampton Roads* report.

As part of the CMP, HRTPO staff analyzed congestion levels on every major roadway throughout Hampton Roads. Approximately 12 percent of the CMP roadway network operated under severe conditions (significant or severe congestion, stop-and-go traffic) during the PM peak hour[3] each weekday afternoon in 2009. Another 20 percent of the CMP roadway network experienced moderate congestion (lower speeds, some delay) during this same peak hour, meaning nearly a third of all major roadways in Hampton Roads were either moderately or severely congested during the PM peak hour in 2009. The remaining network (68 percent) experienced low to moderate congestion levels in 2009.

Figure 2.3: Peak Hour Congestion Levels in Hampton Roads (2009)



Source: Hampton Roads Congestion Management Process report.

Maps 2.3 and 2.4 on the following pages show roadway congestion levels throughout Hampton Roads during the PM peak hour in 2009. Some high profile congested areas include:

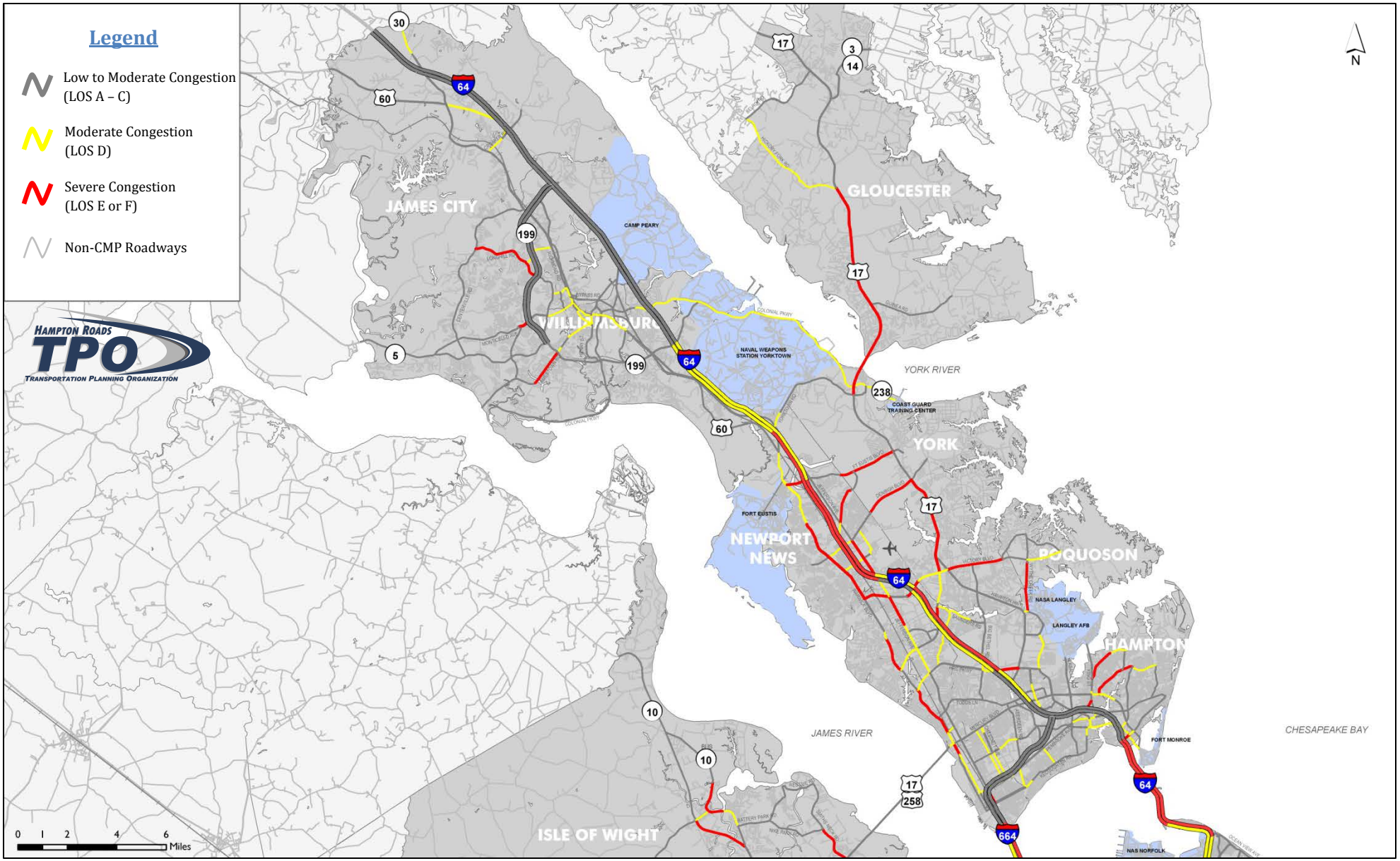
- Hampton Roads Bridge-Tunnel (I-64)
- Downtown Tunnel (I-264)
- Midtown Tunnel/Hampton Boulevard
- High Rise Bridge (I-64)
- I-64 north of Jefferson Avenue
- I-264 east of I-64
- Route 17 on the Peninsula
- I-64/I-564 in Norfolk

More information on roadway congestion throughout Hampton Roads is included in the *Hampton Roads Congestion Management Process* (CMP) report. The report includes an assessment of the regional roadway system, a ranking of the most congested corridors, and congestion mitigation strategies and recommended improvements for these corridors.


Midtown Tunnel

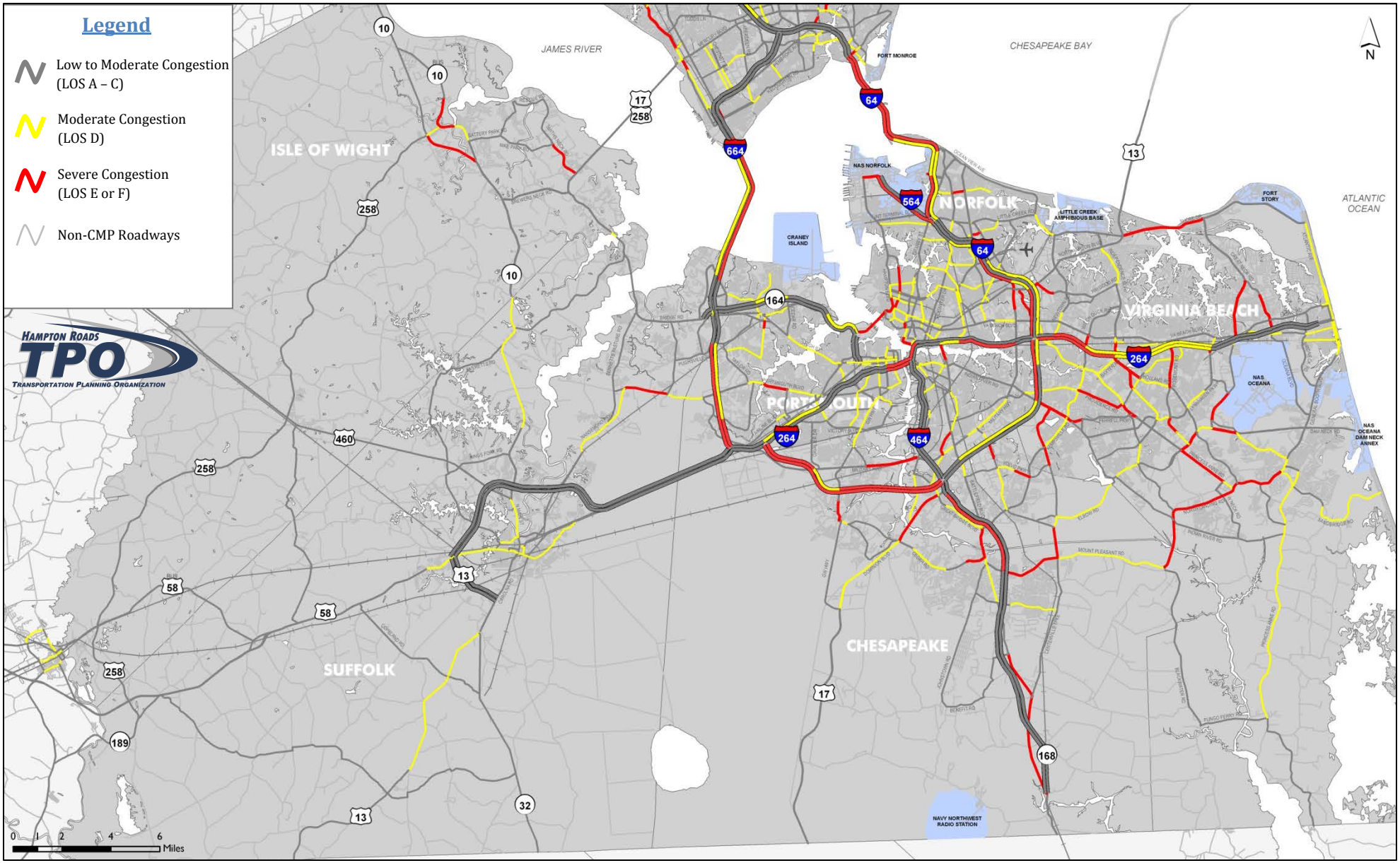
[3] Between 3:00pm-7:00pm

Map 2.3: PM Peak Hour Congestion Levels in Hampton Roads on the Peninsula (2009)



Source: HRTPO Hampton Roads Congestion Management Process report.

Map 2.4: PM Peak Hour Congestion Levels in Southside Hampton Roads (2009)



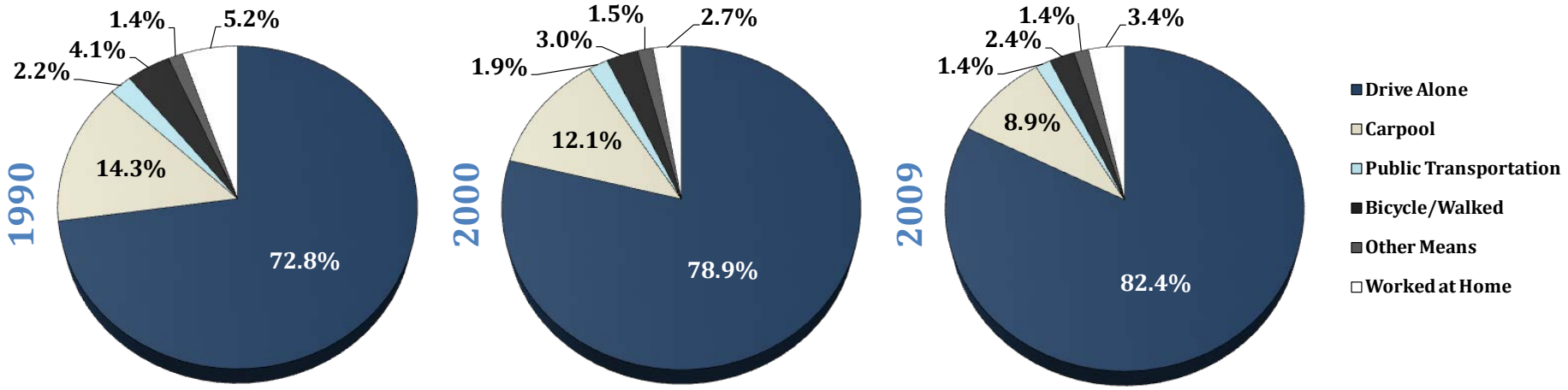
Source: HRTPO Hampton Roads Congestion Management Process report.

Commuting Patterns

The roadway congestion experienced throughout Hampton Roads is largely driven by commuting decisions, such as how, when, and where the residents of Hampton Roads travel. One of the most pronounced trends over the last two decades is that more people are commuting to work by driving alone, which puts more strain on the regional roadway network than other commuting modes. In 1990, about 73 percent of all Hampton Roads commuters drove to work alone. By 2000 this percentage increased to nearly 79 percent, and in 2009 over 82 percent of all Hampton Roads residents drove alone to work. This percentage is high; among 35 metropolitan areas with populations between one and three million people, Hampton Roads had the 7th highest percentage of commuters that drove to work alone in 2009.


Interstate 264 Eastbound near Witchduck Road

Figure 2.4 - Commuting Methods in Hampton Roads, 1990, 2000, and 2009



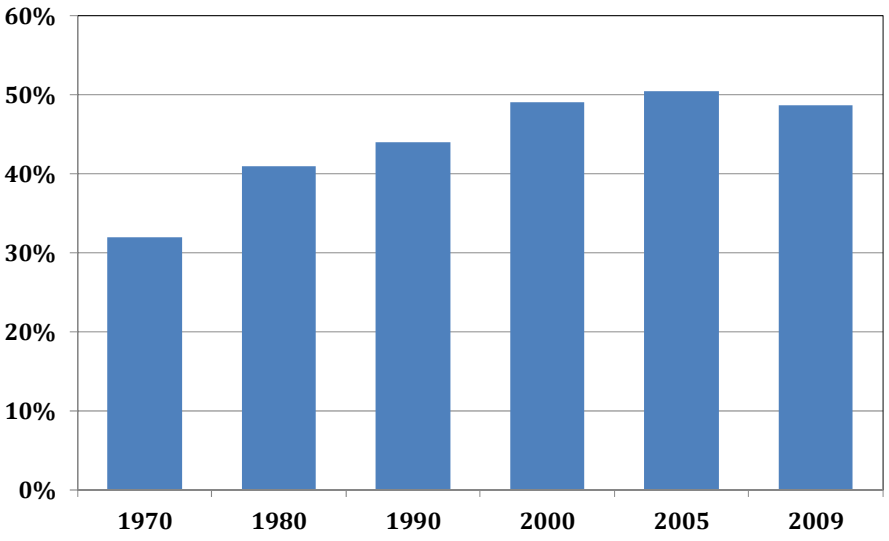
Source: US Census Bureau.

This increase in driving to work alone has come at the expense of all other forms of commuting, including carpooling, public transportation, bicycling, walking, or working from home. According to the Census Bureau, just 8.9 percent of all Hampton Roads commuters carpooled in 2009, 2.4 percent bicycled or walked, 1.4 percent used public transportation, and 3.4 percent worked from home. All of these percentages have decreased from the levels seen in Hampton Roads in 1990.

In addition, commuting patterns in Hampton Roads have increasingly dispersed throughout the region. The number of Hampton Roads commuters that worked in a different locality than their residence has increased from less than 1 of every three commuters in 1970 up to over half of all commuters in 2005 (**Figure 2.5**). In 2009, 48 percent of all commuters in Hampton Roads are placed in this category.

These changes have impacted the amount of time it takes for commuters to travel to work. According to the Census Bureau, the mean travel time to work in Hampton Roads increased from 21.8 minutes in 1990 up to 24.1 minutes in 2000. This commuting time, however, decreased in 2009 to 23.2 minutes. (This 23.2 minute average commute time ranked Hampton Roads 9th lowest among the 35 metropolitan areas between one and three million people).

Figure 2.5 - Percent of Hampton Roads Commuters that Work in a Different Locality than Their Residence, 1970 - 2009



Source: US Census Bureau.

Figure 2.6 - Mean Travel Time to Work in Minutes in Hampton Roads, 1990, 2000, and 2009

Source: US Census Bureau.

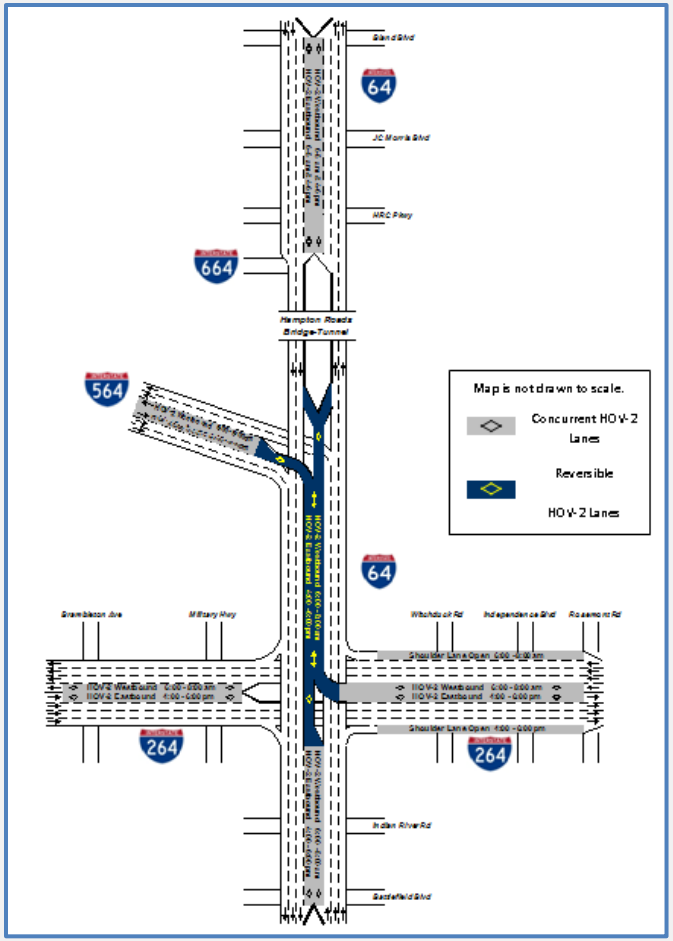
High-Occupancy Vehicle (HOV) Network

As part of an effort to increase vehicle occupancy rates and provide a thoroughfare for express bus service, HOV lanes were first constructed on regional freeways back in 1986. Currently, there are thirty-seven miles of HOV facilities in Hampton Roads. HOV facilities in Hampton Roads require at least two persons per vehicle, with exceptions for motorcycles and licensed low emission vehicles, between 6:00 – 8:00 am and 4:00 – 6:00 pm, depending on the direction of peak travel flow. Outside of these hours, single-occupant vehicles are allowed to use the HOV facilities.

Interstate 64 HOV Lanes near Norview Avenue

Most of the HOV facilities in Hampton Roads are concurrent facilities, meaning that the lanes are adjacent to the regular travel lanes and traffic can enter and exit the HOV lanes at any point. The HOV facility on I-64 between I-564 and I-264 is a reversible, barrier-separated facility with traffic flow going towards I-564 and Naval Station Norfolk during the morning and towards I-264 and Virginia Beach during the afternoon. These reversible HOV lanes on I-64 carry more people than the other HOV facilities in the region.

Figure 2.7: HOV Network



Public Transportation Network

Public transportation is a vital component of the Hampton Roads transportation system, both as a mode of transportation for those unable to drive and as a cost-effective alternative to using single occupant vehicles. The public transportation system in Hampton Roads consists of two transit agencies employing a variety of services: Hampton Roads Transit (HRT) and Williamsburg Area Transit Authority (WATA).

Hampton Roads Transit

Hampton Roads Transit (HRT) is the regional transit provider throughout most of Hampton Roads, providing service to the cities of Chesapeake, Hampton, Newport News, Norfolk, Portsmouth, Suffolk[4], and Virginia Beach. HRT operates and manages a transit system that includes:

- Eighty-one fixed bus routes
- Seven Metro Area Express (MAX) bus routes
- Paddlewheel ferry service between Downtown Norfolk and Downtown Portsmouth
- Two circulator routes (Norfolk Electric Transit and VB Wave)
- Paratransit van services
- Vanpool fleet
- Commuter services via the TRAFFIX program
- Light rail service in Norfolk

HRT's 7.4-mile light rail service, *The Tide*, began service in Norfolk in August 2011. The new light rail service connects various activity centers in Norfolk between the Sentara Norfolk General Hospital complex and Newtown Road (**Map 2.5**). In its first eight weeks with paying riders, the Tide has served approximately 5,000 trips per weekday.

The TIDE at MacArthur Mall

Map 2.5 - The Tide Light Rail System Map

Source: Hampton Roads Transit.

[4] HRT will discontinue service in the City of Suffolk as of December 31, 2011. Virginia Regional Transit will be the new transit provider for the City of Suffolk as of January 1, 2012.

Williamsburg Area Transit Authority

The Williamsburg Area Transit Authority (WATA) is the public transportation provider for Williamsburg, James City County, northern York County, and Surry County. WATA operates and manages a transit system that includes:

- Nine fixed bus routes
- Trolley route
- Paratransit van service
- Historic Triangle shuttle service

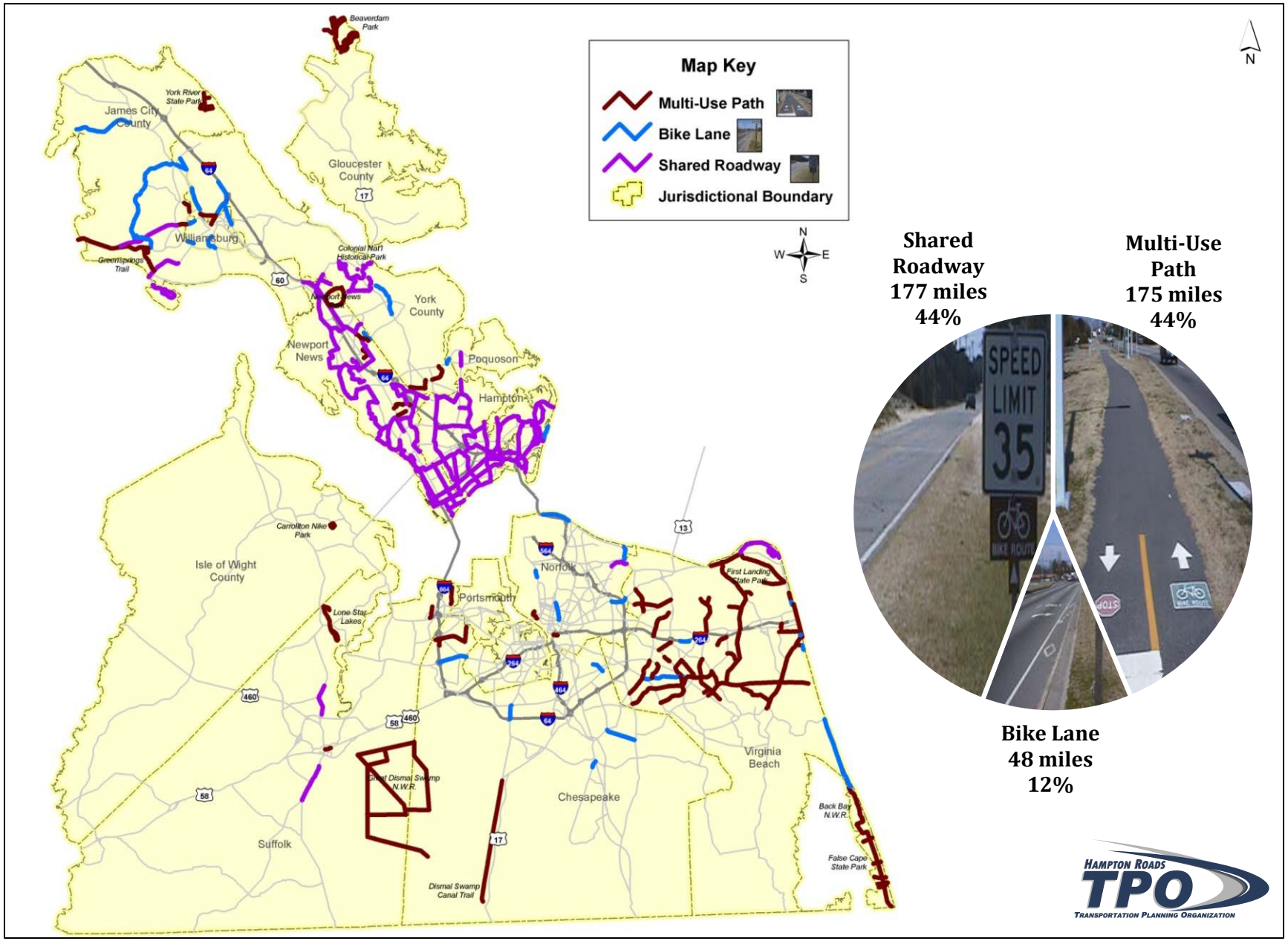
Non-Motorized Network

The non-motorized regional transportation network, which includes various types of bicycle facilities and sidewalks, provides both an alternative means of transportation, and additional recreation opportunities for both residents and visitors of Hampton Roads.

As of 2007, there were 400 miles of bicycle facilities throughout Hampton Roads (**Map 2.6** on the following page). These facilities range significantly in size and scope, from secluded paths in city and state parks to bicycle lanes along major thoroughfares. Of the 400 miles of bicycle facilities in the region, 177 miles are shared roadways, signed bicycle routes that do not have a portion of the roadway reserved exclusively for cyclists. 175 miles of the regional total are multi-use paths, which are separate paths from the roadway that are prohibited for use by motor vehicle traffic. The remaining 48 miles of bicycle facilities in Hampton Roads are bicycle lanes, roadways that have a portion of the pavement delineated for bicycle use only.

Many bicycle facilities have been constructed throughout Hampton Roads in recent years, both as individual projects and as components incorporated into other roadway improvement projects. An 8.5-mile former section of Route 17 in Chesapeake was converted into the Dismal Swamp Canal Trail, a multi-use path that runs parallel to the canal. Phases of the Virginia Capital Trail, which will connect Williamsburg with Downtown Richmond, have also been completed, including all of the sections in Hampton Roads.

Map 2.6 - Existing Bicycle Facilities in Hampton Roads (2007)



Rail Transportation Network Mobility

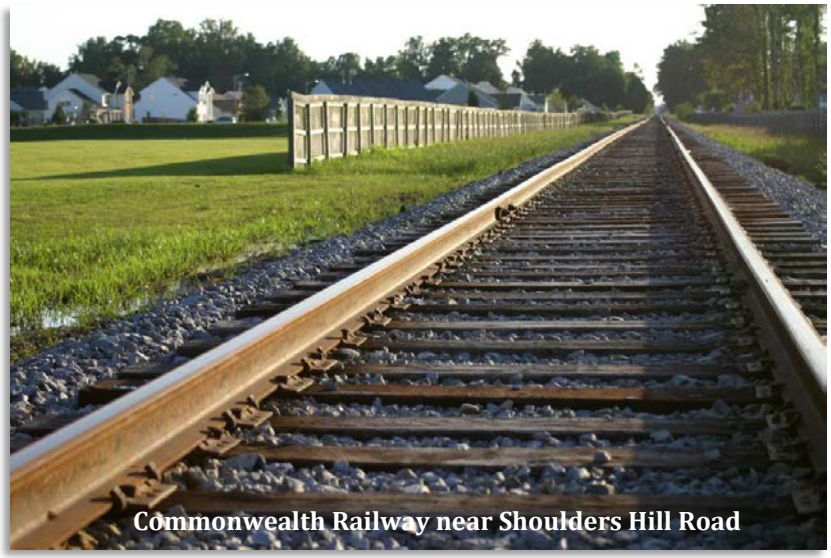
With a network extending 270 miles through Hampton Roads, rail transportation provides a critical mode to move both freight and people in and out of the region.

Freight Rail

Rail is one of the primary methods of transporting goods to and from the Port of Virginia. According to the Port, twenty-eight percent of all general cargo handled by the Port in 2010 was transported by rail. This percentage does not include coal, which is hauled into Hampton Roads by rail and exported to other countries.

Freight that is moved in and out of the Port of Virginia and the region is done over a complex rail network. Two Class I railroads (Norfolk Southern and CSX Transportation) operate in Hampton Roads, as do four Class III shortline railroads (Commonwealth Railway, Bay Coast Railroad, Chesapeake and Albemarle Railroad, and the Norfolk and Portsmouth Beltline Railroad).

Maintenance and capacity improvements on the regional freight rail network, such as the opening of Norfolk Southern's Heartland Corridor, are done within the purview of the private railroad companies with some federal and state supported public-private partnership agreements.



Commonwealth Railway near Shoulders Hill Road

Passenger Rail

Intercity passenger rail service to the region is currently provided on the Peninsula, with Amtrak trains offering two daily roundtrip trains to stations in Newport News and Williamsburg along the CSX freight railway.

The number of customers using passenger rail in Hampton Roads is expected to increase, as the Commonwealth Transportation Board has approved funding for new direct Amtrak service to the Southside beginning in 2013.

SECTION 2: SHAPES AND PATTERNS

Regional Demographics

Regional mobility needs are impacted by where people live, work, and play. Therefore an understanding of population trends and characteristics is necessary to better forecast the region's transportation needs. As population and employment grow, decline, or even shift from one area to another, the demands on the transportation network change as well.

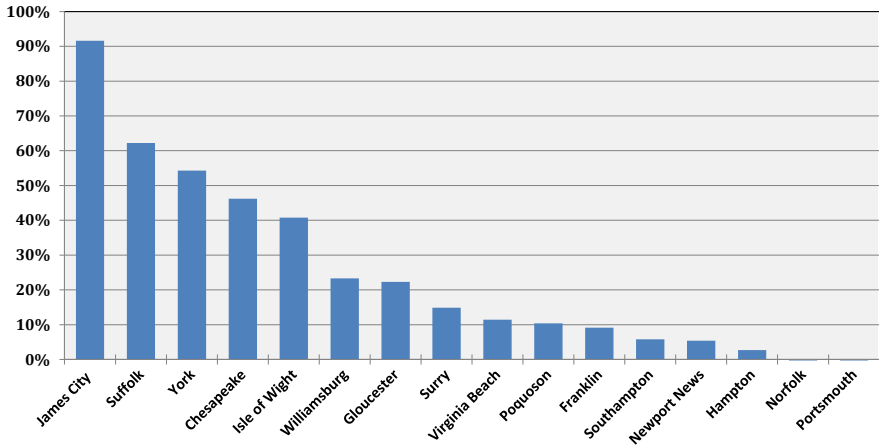
Current Population

Hampton Roads is home to 1.7 million residents. With 2.53 residents per household, this equates to just over 600,000 households. Between 1990 and 2010, the region's population increased by an additional 212,000 residents. However, the rate of population growth in Hampton Roads over this time (15%) trails the growth rate of the State (29%) and the Nation (24%).

About one-third of the Hampton Roads population lives on the Peninsula, with the remaining two-thirds living on the Southside. The Peninsula grew faster than the Southside over the past two decades, with its population increasing from 435,199 residents in 1990 to 513,704 residents in 2010, an 18% increase. The Southside grew from 1,018,986 residents in 1990 to 1,152,606 residents in 2010, an increase of 13%.

James City County, Suffolk, and York County saw the largest increases in population, with growth rates over 50% between 1990 and 2010 (**Figure 3.1**). At the other end of the spectrum, the urbanized cities of Newport News, Hampton, Norfolk, and Portsmouth all saw small increases or decreases in population during this same time period.

Figure 3.1- Percent Growth in Population by Jurisdiction, 1990-2010



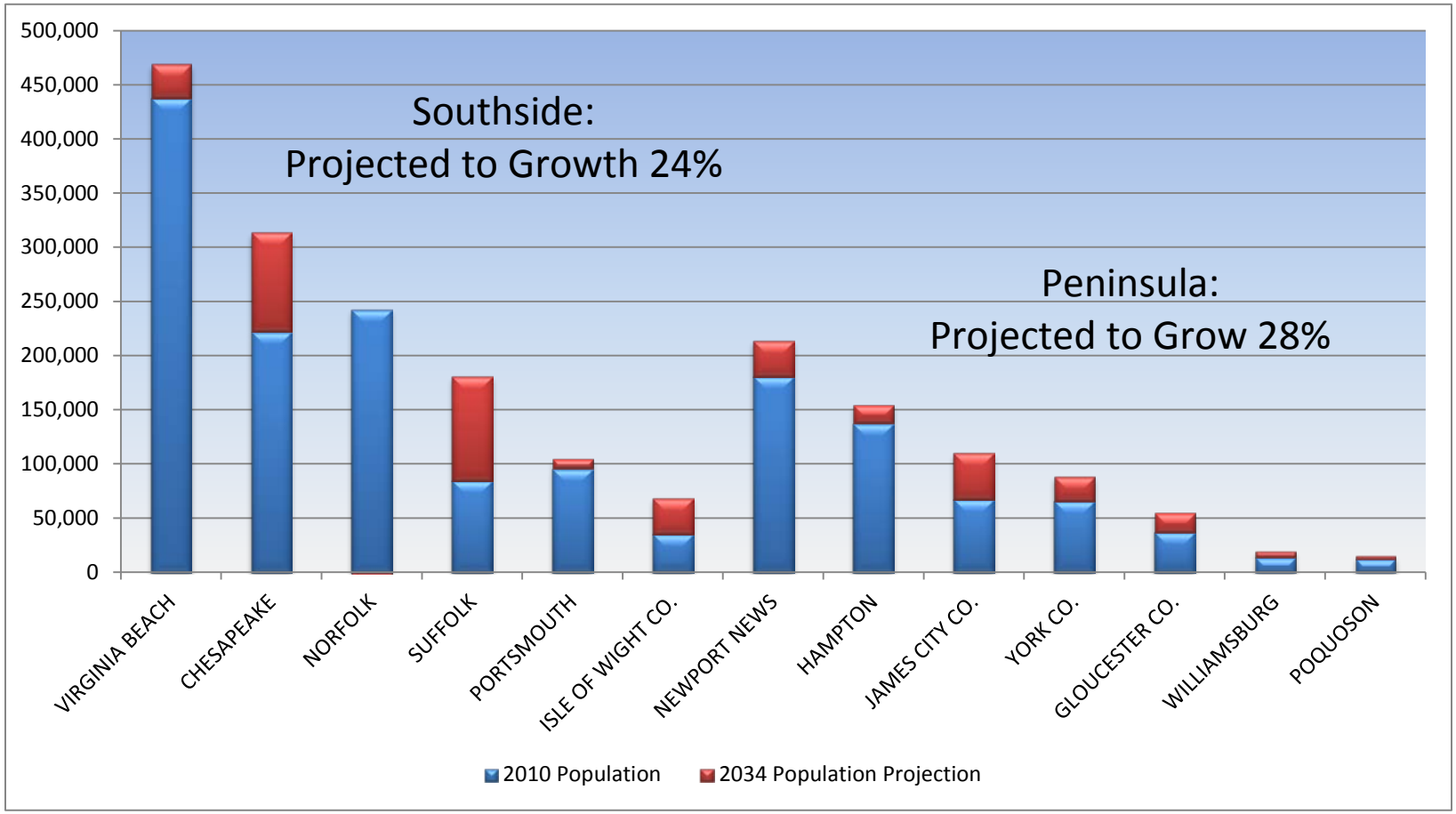
Sources: US Census Bureau, Weldon Cooper Center.

Future Population

As stated previously, population has grown in Hampton Roads over the past decade. Looking towards 2034, the population is expected to increase by 400,000 persons, resulting in a regional community of over two million residents. This translates into approximately 770,000 households for Hampton Roads in 2034.

Figure 3.2 profiles the current and anticipated population for Hampton Roads localities. As seen in the chart, higher anticipated growth rates are expected to occur in Chesapeake, Suffolk, and James City and Isle of Wight Counties.

Figure 3.2: Hampton Roads Current and Anticipated Population Profile



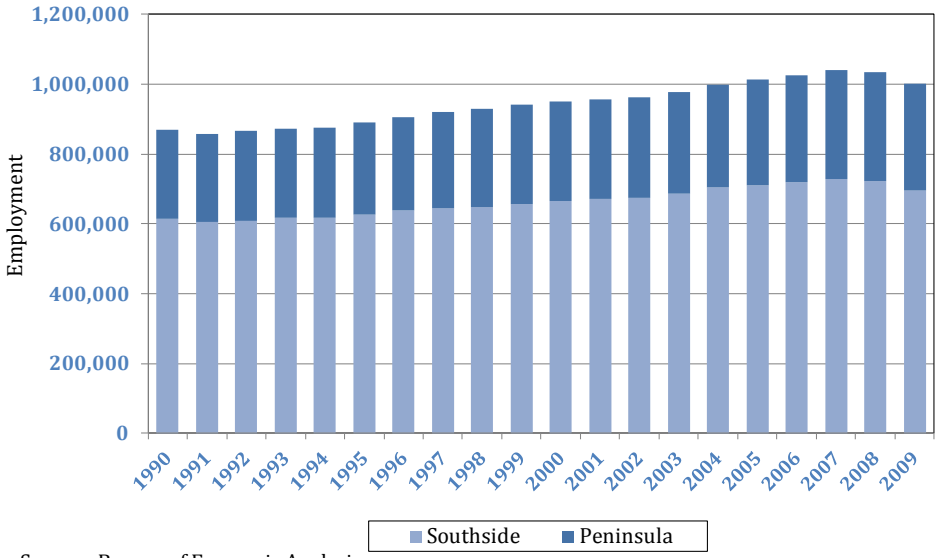
Source: US Census and HRTPO

Current Employment

As with population, the region's employment has also grown in the past decade. There are 1,000,875 jobs in Hampton Roads as of 2009, up 130,530 jobs from the levels seen in 1990 (**Figure 3.3**). As with the rest of the country, the downturn in the economy has impacted employment in Hampton Roads, with the number of jobs about 40,000 lower in 2009 than the level seen in 2007.

Of the 1,000,875 jobs in Hampton Roads, approximately 70% are located on the Southside and 30% on the Peninsula.

Figure 3.3: Hampton Roads Employment, 1990-2009

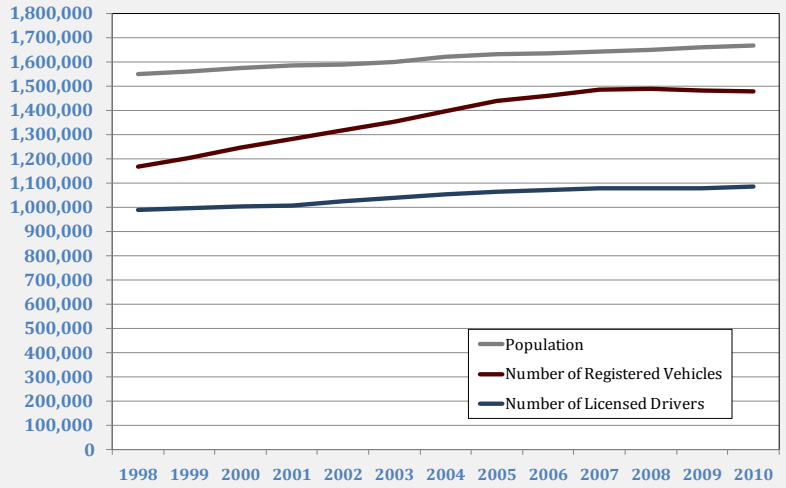


Source: Bureau of Economic Analysis.

Did you know…

The increase in population has also contributed to more drivers and vehicles on the regional roadway system. The growth in the number of vehicles, however, has far outpaced both population and driver growth (**Figure 3.4**). Between 1998 and 2010, the number of registered vehicles in Hampton Roads increased by 27%, up to 1.48 million vehicles. During this time, the growth in registered vehicles was more than three times the growth in both population (8%) and licensed drivers (10%).

Figure 3.4: Hampton Roads Population, Registered Vehicles, and Licensed Drivers, 1998-2010

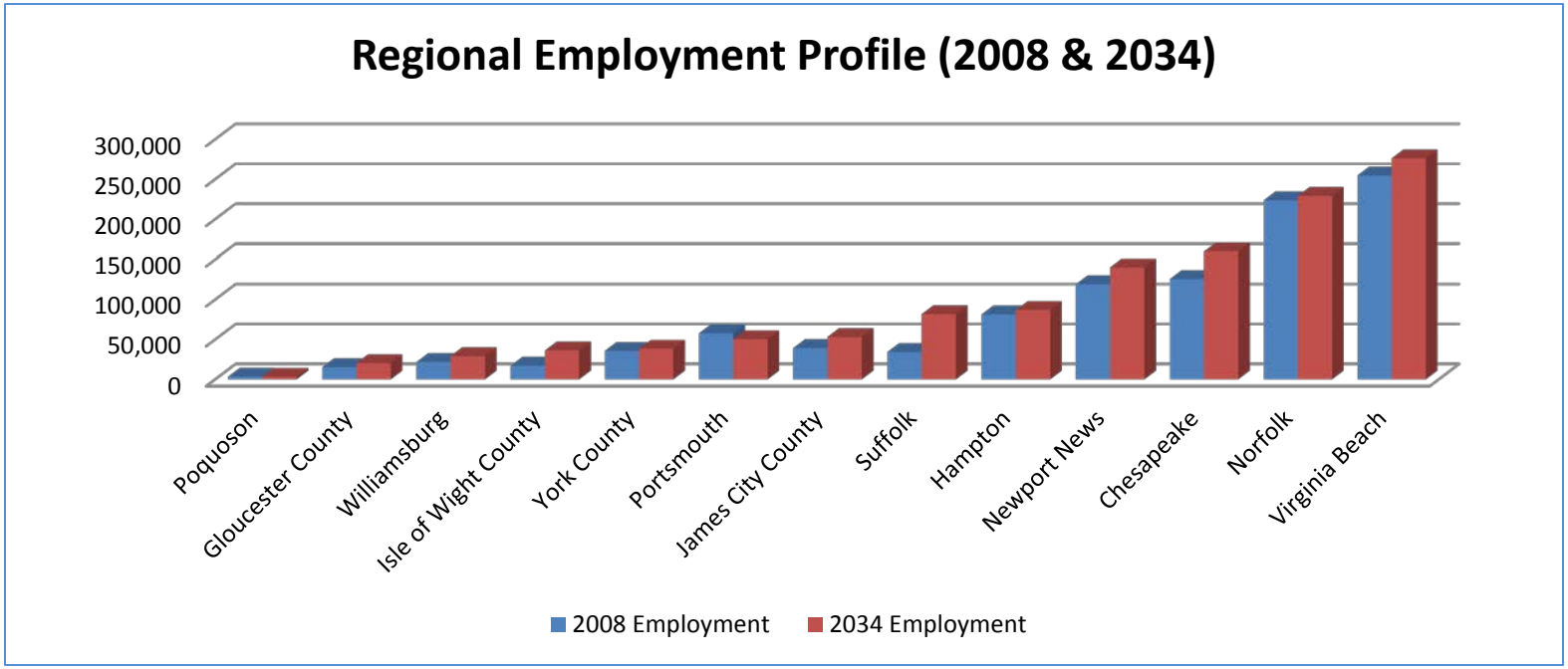


Sources: Virginia DMV, US Census Bureau, Weldon Cooper Center.

Future Employment

As the population in Hampton Roads grows, employment is expected to increase as well. According to the 2034 socioeconomic forecast, Hampton Roads is expected to have slightly more than 1.2 million jobs in the region. The localities with the highest anticipated growth rate include the historically suburban communities of Suffolk, Isle of Wight County, and James City County. **Figure 3.5** profiles the current and anticipated employment for the Hampton Roads localities.

Figure 3.5: Hampton Roads Current and Anticipated Employment Profile



Environmental Justice

Environmental Justice entails the **fair treatment** and **meaningful involvement** of all people regardless of race, color, national origin or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies.

U.S. EPA, Office of Inspector General, Evaluation Report; March 2004

Title VI of the Civil Rights Act of 1964 set a standard that authoritatively outlawed discrimination under any program or activity utilizing federal funds. Executive Orders 12898[1] and 13166[2] reinforced the importance of fundamental rights and legal requirements contained in Title VI of the Civil Rights Act of 1964 and directed that "each Federal agency shall make achieving environmental justice part of its mission."

Environmental Justice helps to ensure that programs, policies, and activities that have adverse effects on communities do not have disproportionately high and adverse effects on minority and low-income populations. The basic concept behind Environmental Justice (EJ) is that federal funds should not be used to support intentional and willfully discriminatory practices or effects on minority and low-income persons.

Federal guidelines require MPOs to enhance their public involvement programs to "ensure the full and fair participation by all potentially affected communities in the transportation decision-making process." Furthermore, MPOs need to address EJ populations and evaluate the extent to which their current programs or activities may cause direct or disparate impacts.

An important step in addressing EJ concerns is to identify those populations that may experience barriers to mobility and therefore, may be adversely affected by transportation planning decisions. These groups include:

- Minority Populations
- Persons in Poverty
- Elderly Population
- Medical and Functional Needs Population
- Linguistically-isolated Households (non-English speaking households)
- Zero-Vehicle Households

This section describes regional characteristics of each group stated above. Mobility issues, fair treatment, and meaningful involvement in the transportation planning process will be discussed in later chapters.

[1] Executive Order 12898 was issued on February 11, 1994.
[2] Executive Order 13166 was issued on August 11, 2000.

Minority Populations

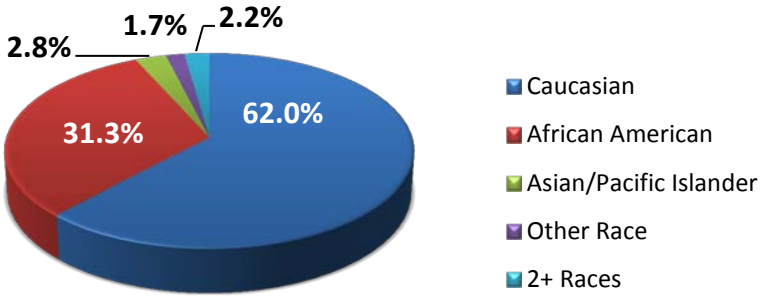
Minority populations are often underrepresented in the transportation planning process. For the purposes of EJ, the term 'minority' refers to racial and ethnic minorities, including: African American, Hispanic, American Indian and Alaskan Native, and Asian-American.

In the 2000 Census, 38 percent of Hampton Roads was comprised of people from minority racial backgrounds (**Figure 4.1**). As of the 2010 Census, this number increased to 41 percent (**Figure 4.2**).

Ethnic origin is considered to be a separate component from race. Hispanic ethnic origin, often included in the minority definition, deserves special mention since it is not a racial category. Hispanics are defined as persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race. Thus, persons of Hispanic origin can be of any race.

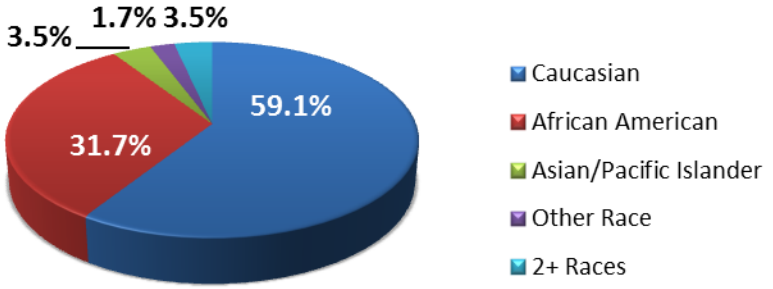
In 2000, 3.2 percent of the regional population noted a Hispanic heritage background. In 2010, those of Hispanic descent increased their share of Hampton Roads' population to 5.4 percent.

Figure 4.1: 2000 Hampton Roads Racial Profile



Source: US Census

Figure 4.2: 2010 Hampton Roads Racial Profile



Source: US Census

Persons in Poverty (Low-Income)

In 2010, poverty was defined by the US Department of Health and Human Services as a household income at or below $22,050 for a family of four. For the purposes of characterizing poverty in the region, HRTPO staff identified low-income households (households with incomes at or below 200 percent of the poverty level[3]) and households that received public assistance.

In low-income households, housing, transportation, and food costs exceed or disproportionately consume household income. Once basic needs are met, little to no income remains to improve the household's quality of life. Often, these households have minimal or no access to vehicles, making it difficult to get back and forth to work, school, shopping, etc.

In Hampton Roads, poverty rates have remained relatively constant over the past decade. As of 2010, the region had 60,886 households living in poverty, translating to 9.9 percent of the region's households[4]. Though poverty has remained constant in the Hampton Roads region, there has been a drop in the number of low-income households as well as households receiving public assistance. In 2010, approximately 38 percent of the households in Hampton Roads were classified as low-income, down from 40 percent in 2000. Of the total households in the region in 2010, 2.2 percent received public assistance; down from 2.8 percent in 2000.

Table 4.1: 2000 and 2010 Low-Income Households

Income Characteristics	2000		2010	
	Number of Households	% of Total	Number of Households	% of Total
Low-Income Households	226,087	39.9%	237,553	38.4%
Households receiving Public Assistance	16,101	2.8%	13,787	2.2%

Source: 2000 Census and 2010 ACS

[3] Source: US Department of Health and Human Services

[4] Source: 2010 American Community Survey

Elderly Populations

The population in a region is comprised of people of varying ages. A traditionally healthy community and economy have a generation spectrum that resembles a pyramid (see **Figure 4.3**)[5]. At the tip of the population pyramid are the elderly members of the community, followed by a broader working adult population, and supported at the base by the children of the working adult population. A traditionally broad pyramid base composed of children ensures ample replacement to the current working population.

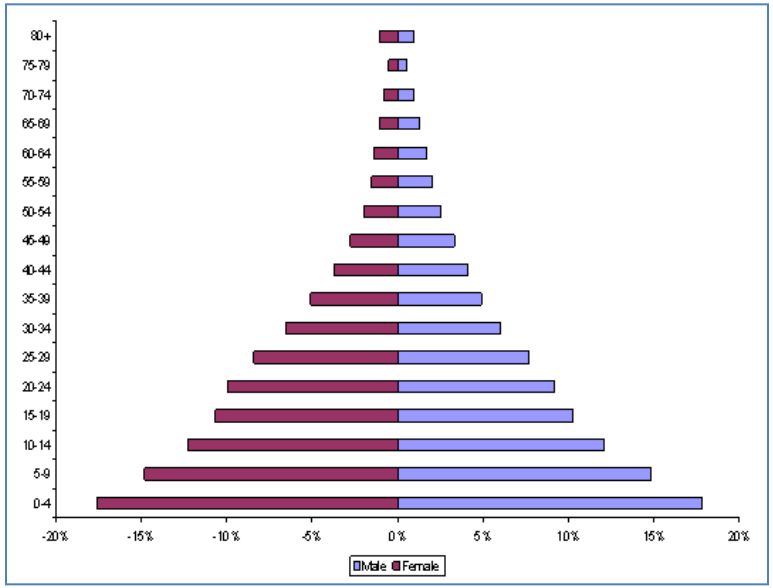


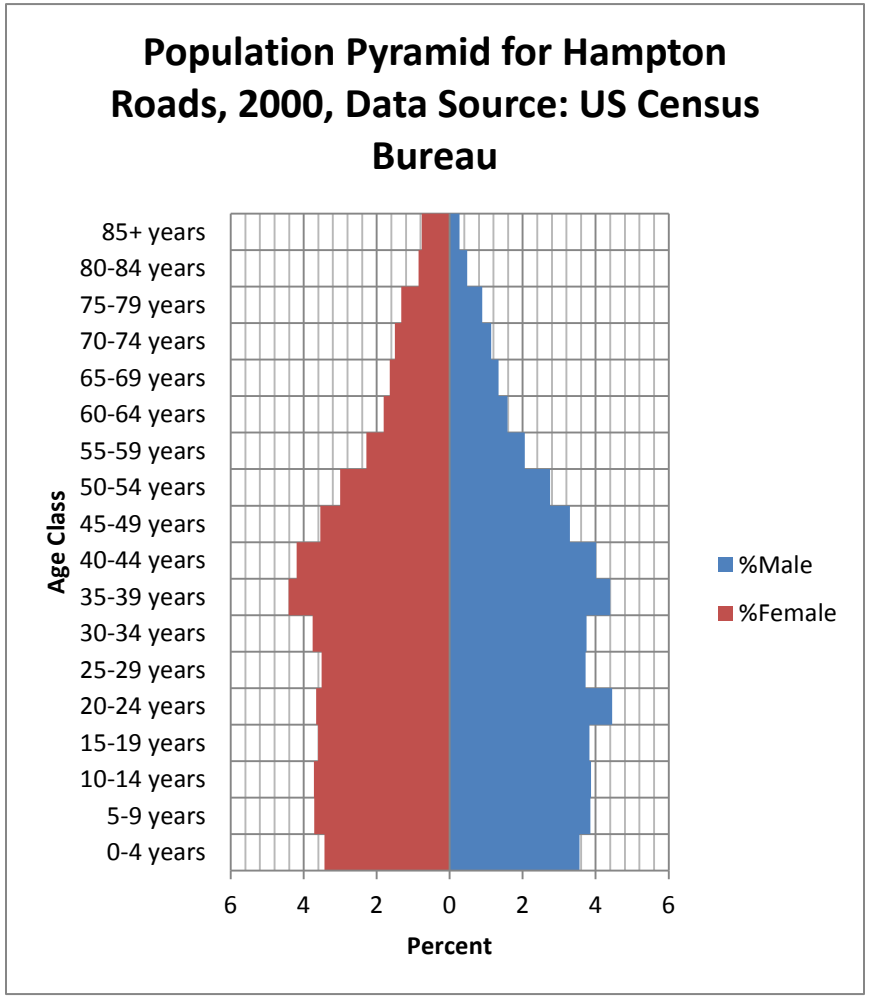
Figure 4.3: Traditional Population Pyramid

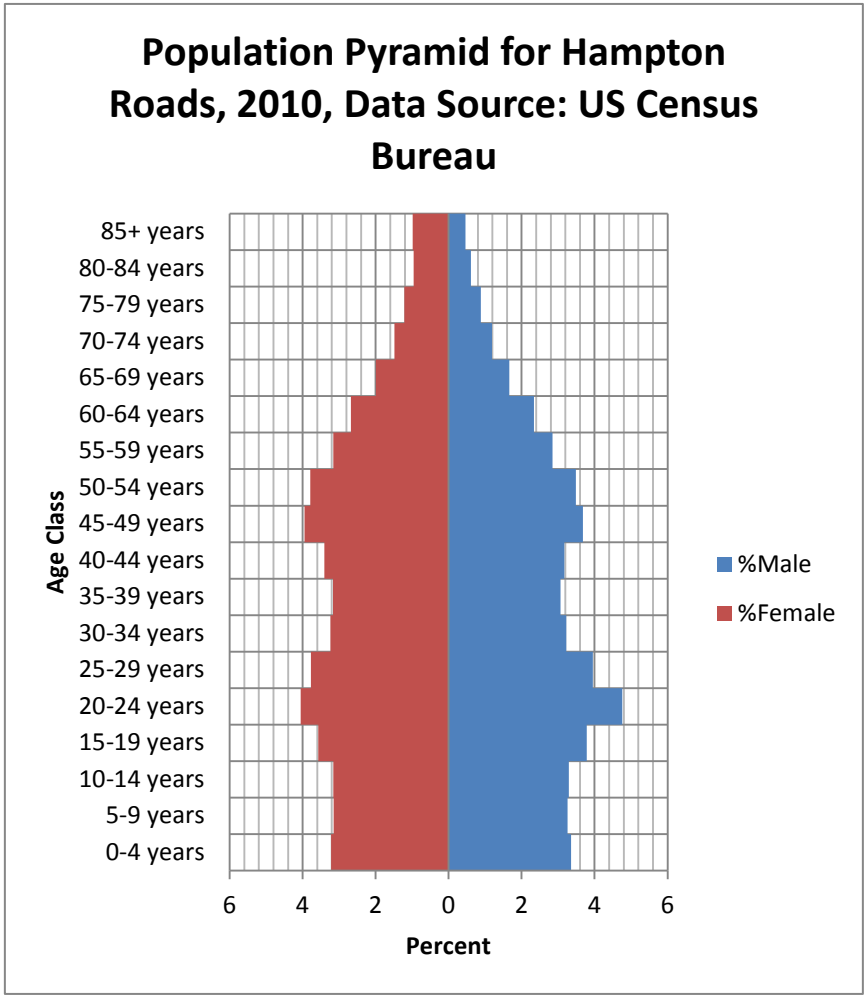
In Hampton Roads, as with the rest of the United States and other industrialized nations, the traditional population pyramid is eroding with the shifting of age distribution. The portion of elderly is increasing, while the young are becoming less numerous which can be attributed to the fact that people are living longer and having fewer children (**Figure 4.4** depicts the regional population pyramid for the 2000 and 2010 Census). This trend will have implications in the near future as there will be fewer children to replace the working population.

11.6 percent of the regional population was identified as age 65 or older in 2010, compared with 10.2 percent in 2000.

[5] Traditional population pyramids exhibit a lower dependency ratio, or ratio of dependents (children and elderly) cared for by the working age population (Source: Population Geography, Peters, G. and Larkin, R. (2005)).

Figure 4.4: 2000 and 2010 Regional Population Pyramid





Medical and Functional Needs Populations

Another group of people in our community who often experience barriers to mobility include those with medical and functional needs. This group is defined as people with mobility, sensory, or intellectual challenges acquired either at birth, abruptly, or evolved over time.

In Hampton Roads, approximately 10.5 percent of the region's population is identified as members of the medical/functional needs community[6].

Linguistically-Isolated Households

Another group identified for EJ analysis includes linguistically-isolated households (households in which English is not spoken at home). In 2000, there were 63 documented languages spoken in Hampton Roads other than English[7]. Common languages include Spanish, Tagalog, French, German, Korean, and Vietnamese. Approximately 8 percent of the regional population reported speaking a language other than English at home.[8]

Certain segments of this population experience a greater struggle in communicating in English. In 2000, approximately 12,409 persons, or 0.9 percent of the total Hampton Roads population were identified as Limited English Proficient (LEP) persons. This number climbs in 2009, to 17,730 persons, or 1.1 percent. As the region continues to grow and diversify, it can be anticipated that Hampton Roads will have an LEP population that will grow in parallel.

Zero-Vehicle Households

Zero-Vehicle Households are those households without access to cars. This population is often referred to as "transit dependent," meaning these individuals must rely on public transit for their daily travel needs.

In 2000, approximately 9.8 percent of the region's households were identified as carless. In 2010, approximately 6.2 percent of households were identified as carless.

[6] Source: Hampton Roads Benchmarking Study (2010), HRPDC.
[7] Source: 2000 Census, Special Tabulation 224, US Census Bureau.
[8] Source: 2000 Census, Summary File 3, US Census Bureau.

Section 3 – Framing the LRTP

Public Involvement


High-Speed and Intercity Passenger Rail Public Meeting

Public involvement is a critical component in the development of the 2034 LRTP. As stated previously, transportation has a significant impact on the residents of Hampton Roads and is closely intertwined with the economic health of the region; therefore, citizen participation in the development of the regional transportation plan is essential.

In order for citizens to be involved, they must first be informed of not only the transportation planning process, but also of the way in which their involvement can shape and enhance programs and policies. As such, a major goal of the 2034 LRTP is to reach out to all citizens in Hampton Roads and engage them in meaningful dialogue regarding the process itself, their needs and perceptions, potential impacts to their way of life and their community, as well as the elements of the 2034 LRTP. This goal helps to ensure that potential Environmental Justice (EJ) issues are recognized and properly addressed and that interested members of the public have ample opportunity to provide meaningful input while the LRTP is being developed. Furthermore, the HRTPO understands that early and continuous public involvement during the development of the LRTP is important since the LRTP is the regional transportation plan that will guide transportation investment over the next twenty years.

LRTP Public Participation Objectives

LRTP public participation objectives include:

- Providing broad-based access to the LRTP planning process
- Developing and disseminating information about the long-range transportation planning process through multiple sources, with clear, non-technical language
- Engaging all aspects of the public, including minority, low-income, disabled, and elderly persons in a meaningful exchange of ideas related to the transportation planning process
- Establishing working relationships with partner and peer organizations in the region with the purpose of information exchange, resource sharing, and regional dialogue

The development of the 2034 LRTP was a transparent process in which HRTPO staff provided broad-based access to all LRTP related material. This included utilizing the World Wide Web, direct and electronic mail, providing public comment

opportunities and draft versions of the LRTP in regional libraries, conducting outreach and partnering with community organizations and existing events, as well as holding public meetings, community events, and dialogues across the region to share information and gain public input on the LRTP.

In addition to community outreach, the HRTPO remains committed to presenting transportation-related information in a clear and concise format. Wherever applicable, staff utilizes various visualization techniques to present information in an easy to understand manner to accommodate a wide range of audiences.

In an effort to elicit widespread and meaningful input, HRTPO staff incorporates various methods to target the culturally rich and diverse communities of Hampton Roads. A concerted effort was made to reach out to Environmental Justice (EJ) populations, comprised of minority and low-income populations, as well as other traditionally underrepresented populations (refer to Chapters 4 for a description of EJ populations and Chapter 19 for maps illustrating the distribution of these identified groups).

The HRTPO staff also set out to establish community relationships during the development of the 2034 LRTP in order to increase awareness of the LRTP planning process as well as the need and impact of the plan. Community relationships were created with local elementary schools and civic organizations.

All public involvement efforts are documented in order to demonstrate the efforts implemented by the HRTPO. The HRTPO strives to provide interested and concerned citizens of Hampton Roads ample opportunity to review and comment on regional transportation priorities. Moreover, citizen input is provided to the HRTPO Board and its advisory committees so that citizen input is considered throughout the development of the LRTP.

Visualization Tool

As part of the commitment to relate information to interested citizens in a clear and concise format, HRTPO staff developed a more user-friendly visual medium to review 2034 LRTP projects. This visualization tool is an interactive map built using Google Earth in which the public can obtain more information about candidate projects as well as projects approved for inclusion in the fiscally-constrained LRTP. The tool is accessible through the HRTPO website.

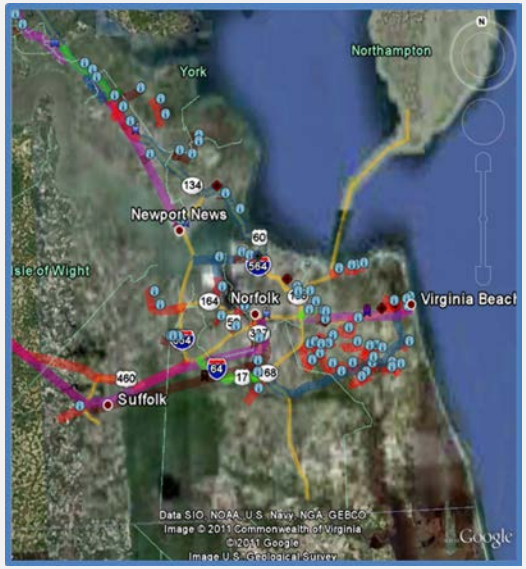


Figure 5.1: HRTPO Visualization Tool

Public Involvement Requirements

Federal requirements for the public involvement process related to the transportation planning process are identified in *23 CFR 450.316* and *23 CFR 450.322*. Per these regulations, MPOs are required to document a participation plan that defines a process for providing citizens, affected public agencies, representatives of public transportation employees, freight shippers, providers of freight transportation services, private providers of transportation, representatives of users of public transportation, representatives of users of pedestrian walkways and bicycle transportation facilities, representatives of the disabled, and other interested parties, with reasonable opportunities to be involved in the planning process.

The following criteria should be met regarding public involvement opportunities:

- Providing adequate notice of public participation activities
- Providing timely notice and reasonable access to information pertaining to transportation issues and processes
- Using visualization techniques
- Making public information available in electronically accessible formats and means, such as the World Wide Web
- Holding public meetings at convenient and accessible locations and times
- Demonstrating explicit consideration and response to public input received
- Providing an additional opportunity for public comment, if the final plan differs significantly than the version made available for public comment
- Coordinating with the statewide transportation planning public involvement and consultation processes
- Periodically reviewing the effectiveness of the procedures and strategies contained in the participation plan to ensure a full and open participation process

Project Prioritization Public Meeting

Opportunities for Citizen Input

As indicated in the HRTPO *Public Participation Plan*, the following strategies were available and utilized for engaging the public in the development of the LRTP, including:

Environmental Justice Involvement: Identifying current Environmental Justice and other traditionally underrepresented populations within Hampton Roads to ensure these communities are involved.

Website: Maintaining a webpage dedicated to the development of the LRTP. Users will be able to access LRTP information, progress, and opportunities to become involved. The HRTPO

website will be utilized to advertise upcoming meetings and public participation activities.

Public Meetings and Open Houses: Holding public meetings/Open Houses related to the LRTP.

Surveys/Polls: Conducting surveys and polls to solicit public input. This can be done via the internet, telephone surveys, or portable, recently improved, computer kiosks to facilitate participation by all interested groups.

Partnerships: Establishing partnerships with regional organizations and agencies to both disseminate information and encourage input from their members.

Community Conversations: Engaging community groups via "Community Conversations" by providing the opportunity for HRTPO staff to appear before local community groups. This effort includes the School Outreach program.

HRTPO Board, Advisory, and Subcommittee Meetings: Communicating LRTP updates and information via the HRTPO Board, Advisory (i.e. TTAC, FTAC. CTAC), and Subcommittee meetings (i.e. LRTP Subcommittee). These meetings also provide public participation opportunities, as members of the public are allotted time at the start of each of these meetings to speak. In addition, Board members can share information with their community members.

Newsletter and E-Newsletter Articles: Including articles relating to the development of the LRTP in the HRTPO newsletter/e-newsletter.

Social Media: Using Facebook to disseminate information regarding upcoming public participation opportunities and development of the LRTP.

Transit Vision Plan Public Meeting

Public Notices: Distributing notices pertaining to LRTP public involvement activities via electronic correspondence (email) and/or direct mail, including any public meeting and/or surveys.

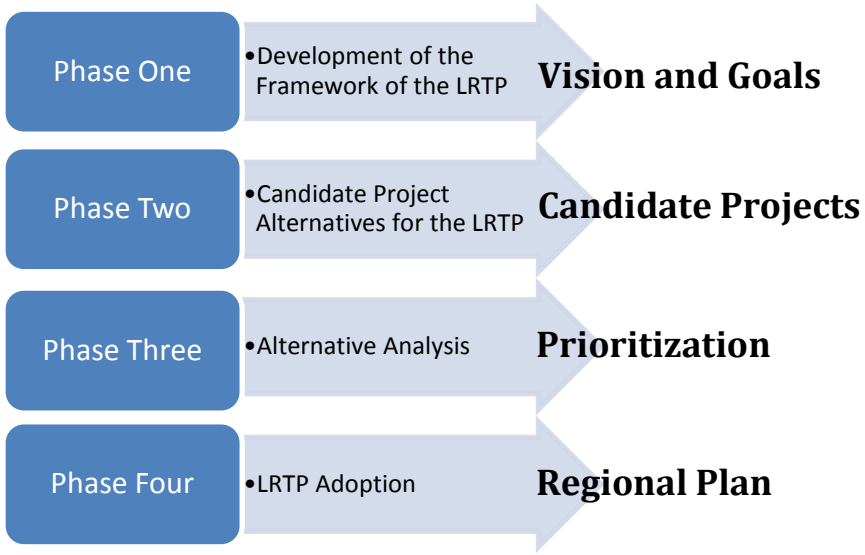
Visualization: Incorporating visualization techniques to help the public better understand transportation options as well as facilitate more meaningful input.

For more information about these strategies, please refer to the HRTPO *Public Participation Plan* (December 2009).

Getting the Community Involved

Since the LRTP is a multi-year effort, development of the LRTP occurs in phases. Therefore, HRTPO staff conducted public outreach in accordance with each phase (see **Figure 5.2**). Engaging the community during all phases of the development of the LRTP is essential to the overall success of the plan.

Figure 5.2: 2034 LRTP Public Outreach Phases



Phase One

This phase is dedicated to establishing the vision and goals of the LRTP and includes the following tasks:

- Review federal, state, and local public involvement requirements
- Develop a public involvement plan for the 2034 LRTP
- Develop a database of stakeholders and interested parties
- Conduct spatial analysis of EJ communities
- Branding of the LRTP (design logo, webpage, and marketing pieces)
- Solicit public input regarding regional priorities and concerns

Phase Two

This phase is dedicated to collecting candidate transportation projects for the LRTP and includes the following tasks:

- Collect candidate projects from stakeholders, including citizens
- Review candidate projects with the LRTP subcommittee
- Collect data for candidate projects

Phase Three

This phase is dedicated to alternative analysis for the LRTP. The Project Prioritization Tool was used to analyze and evaluate projects for the LRTP. This phase includes the following tasks:

- Solicit HRTPO Board, HRTPO Advisory and Subcommittees, regional stakeholder, and public input regarding prioritization criteria and weighting factors
- Finalize methodology for Project Prioritization Tool
- Hold public meetings regarding Project Prioritization results

Phase Four

This phase is dedicated to the adoption of the LRTP, including the list of projects and studies in the plan as well as the report documenting the LRTP planning process. This phase includes soliciting the HRTPO Board, HRTPO Advisory Committees and Subcommittees, regional stakeholders, and public input regarding the following items:

- Projects and studies in the LRTP
- Air Quality Conformity results
- LRTP report and marketing pieces

Outreach Efforts

During the initial development of the LRTP, HRTPO staff updated its *Public Participation Plan*. As part of this process, public meetings were held across the region to gather citizen input regarding outreach preferences and strategies. In Spring 2012, the new HRTPO *Public Participation Plan* will be released; this plan will outline tools and methods developed for the 2034 LRTP.

The HRTPO's Limited-English Proficiency (LEP) Plan was revised. A database of regional stakeholders, including civic organizations and interested citizens was updated. Environmental Justice Communities were also identified using GIS to investigate the spatial distribution and concentration of these groups.

In an effort to make the LRTP more engaging to the public, a logo was created as was a dedicated webpage and Facebook page.

Several public meetings were also held regarding Phase One of the Transit Vision Plan and High-Speed and Intercity Passenger Rail.

Between April and July of 2009, HRTPO staff conducted an extensive public involvement survey to solicit citizen input regarding regional priorities and concerns. Citizens were also asked to submit transportation investment ideas to be considered for the 2034 LRTP. The survey was hosted on the HRTPO website and the LRTP webpage. It was also advertised in the regional libraries and a direct mailing was sent to local civic organizations. In addition, the HRTPO staff attended a regional Housing Fair to encourage citizens to participate in the survey. Finally, paper copies were also made available by request. Please refer to Chapter 6 for summarized results of this survey as well as the Public Involvement Appendix.

High-Speed and Intercity Passenger Rail Public Meeting

In March of 2010, Christopher Newport University conducted several focus groups throughout the region to help gauge citizens' regional concerns and attitudes regarding transportation in Hampton Roads.

The public had several opportunities to provide input during the Prioritization process. While developing the Project Prioritization Tool, the public was able to analyze the criteria used to evaluate projects as well as the criteria weighting factors. Additionally, the public was asked to review and comment on the scoring of the 2034 LRTP candidate projects. Public meetings were held on the Southside and the Peninsula, giving the public an opportunity to review the results from the Project Prioritization Tool. All candidate projects were detailed in the web-based Visualization Tool.

School Outreach Public Meeting

The School Outreach program was established to help increase public awareness of the transportation planning process and to engage both children and their parents in the LRTP. During the development of the 2034 LRTP, HRTPO staff worked with two local elementary schools (Linkhorn Park Elementary and Thoroughgood Park Elementary) to teach students about the importance of transportation and community planning. At each school, a 'town-hall' meeting was held giving the students an opportunity to showcase their hard work and for parents to learn more about the HRTPO, the LRTP, and the transportation planning process.

Additional public meetings were held across the region to encourage the public to review and comment on the projects approved by the HRTPO Board for inclusion in the fiscally-constrained 2034 LRTP. Details about each project were presented on 'one-page summaries' to make the information more readable and engaging to stakeholders and the public. All projects were also detailed in the web-based Visualization Tool.

HRTPO's Citizens Transportation Advisory Committee (CTAC) is comprised of concerned citizens from across the region with diverse backgrounds. LRTP status updates were presented to the committee throughout the development of the plan; Prioritization results, the fiscally-constrained list of projects and studies, and the LRTP report were also presented to CTAC. CTAC members were also invited to provide feedback on various aspects of the LRTP during the development of the plan.

Several articles were written for the HRTPO newsletter and e-newsletter, highlighting LRTP milestones along the way. Numerous presentations were given by several staff members to diverse groups and organizations throughout the area.

The public was also given the opportunity to review the results from the air quality conformity analysis.

Finally, over a 30-day period, the draft 2034 LRTP was made available on the HRTPO website for public review. Hard copies of the report were also placed in all regional libraries. Additionally, digital copies of the report were provided to stakeholders and interested citizens who participated and/or provided feedback during the development of the LRTP.

School Outreach


School Outreach Public Meeting

School Outreach Program

As part of the 2034 LRTP planning process, HRTPO staff developed a robust, progressive public outreach strategy with particular attention focused on reaching out to traditionally underrepresented populations. The HRTPO staff outlined a strategy that focused on getting out into the community to discuss issues rather than expecting the community to come to the HRTPO. These '*Community Conversations*' would bring the relevance of regional transportation issues to the community. The HRTPO staff recognized some members of the public would find themselves invested in regional transportation issues, but others might find difficulty in understanding how they could contribute to regional transportation endeavors. The above concern led HRTPO staff to think outside of the traditional norm, and engage an untapped population.

One option for encouraging those who are unsure how to effectively contribute is to help them better understand the process and the importance of public participation – and a great population to start with is the youth of Hampton Roads. Staff set out to foster partnerships within the community by reaching out to local schools to educate youth about transportation and community planning. This envisioned effort would have a two-pronged effect: directly educating future users of the transportation system, emphasizing how they can contribute to its development. In parallel, the effort would also reach out to parents, the current users of the system, to both inform and engage them in the transportation planning process. Additionally, the HRTPO benefited from the perspective offered by the school children.

Starting in the fall of 2009, HRTPO staff teamed up with local elementary schools to educate students about transportation planning and subsequently engage their parents in the LRTP planning process. This program included the development of lesson plans with school faculty, teaching the curriculum to students, and culminated with a "town-hall style" meeting where children presented their work to their parents. The lesson plans taught the children key concepts such as: Communities, Planning, Transportation, Connectivity, Conservation and Good Citizenship. These very concepts were what the children applied to the planning and construction of their own '*Box Community*'.

Current plans for the school outreach program include engaging EJ communities throughout Hampton Roads and working within their school systems. This outreach effort will help ensure that the HRTPO will effectively involve and reach out to traditionally underrepresented populations through the heart of their community: the local schools. Finally, it is the goal of HRTPO staff to enhance the school outreach program so that local schools and students can serve as conduits to the public – empowering both current and future users of the transportation system with the knowledge and confidence to participate in the transportation planning process.

School Outreach

Summary of Outreach Efforts

Below is a listing of outreach efforts conducted during the development of the 2034 LRTP:

Technology-based

- World Wide Web
  - HRTPO.org and KeepHamptonRoadsMoving.com website
    - Statistics of web visitors:
    - HRTPO.org
      2008 (start 6/2008) – 11,025
      2009 – 103,303
      2010 – 270,702
      2011 (to date) – 489,615
    - KeepHamptonRoadsMoving.com
      2009 (start 3/2009) – 3,344
      2010 – 3,285
      2011 (to date) – 3,200
  - HRTPO E-Newsletter
    - Statistics of web visitors:
    - 2010 (start 9/2010) – 1,337
    - 2011 (to date) – 8,96
  - Facebook
  - LRTP Visualization Tool
    - Statistics of web visitors:
    - 2010 (June Start)– 281
    - 2011 (to date) – 729

Environmental Justice Involvement

- Spatial Analysis of EJ communities
- LEP Plan developed
- ADA Plan developed
- Title VI and EJ Plans updated
- Libraries in EJ communities identified
- EJ Outreach Database developed

In the Field

- Phase One of the Hampton Roads Transit Vision Plan public meeting (October 2008)
  - Meeting held in Chesapeake, with live interactive video feed in Hampton
  - Flyers distributed in EJ neighborhoods
- Public Information Meetings regarding draft Transit Vision Plan (February 2009)
  - Meetings in Norfolk and Hampton
  - Plan also accessible through the HRTPO website for review and comment
- Housing conference booth (June 2009)
  - See Public Involvement Appendix for listing of participating agencies at conference
- Public meetings regarding *Public Participation Plan* update (August 2009)
- DRPT High Speed and Intercity Passenger Rail (HSIPR) Public meetings regarding Richmond to Hampton Roads rail service (January 2010)

Housing Conference

    - Large crowd of 500 to 1,000 attendees
- School Outreach
    - Linkhorn Elementary (March 2010)
    - Thoroughgood Elementary (November/December 2010)
- Christopher Newport University focus groups (March 2010)

Meetings and Advisory Committees

All HRTPO Board, advisory, and subcommittee meetings are open to the public and include a public comment period.

- HRTPO Board
    - Meetings held every month at The Regional Building in Chesapeake
    - Comprised of representatives from local, state and federal governments; transit agencies; and other regional stakeholders
- Transportation Advisory Committee
    - Meetings held as needed
    - Comprised of the chief administrative officer of each HRTPO member locality and local transit agency, plus representatives from VDOT, DRPT, the Virginia Port Authority (VPA), FHWA, FTA, and other regional stakeholders.
- Transportation Technical Advisory Committee (TTAC)
    - Meetings held every month at The Regional Building
    - Membership includes transportation engineers and planners from each HRTPO member locality, representatives from local transit agencies, VDOT, DRPT, VPA, FHWA, FTA, and other regional stakeholders
- Citizens Transportation Advisory Committee (CTAC)
    - Meetings held every two months, in the cities of Hampton and Chesapeake, alternatively
    - Comprised of residents of HRTPO member localities
- Freight Transportation Advisory Committee (FTAC)
    - Meetings held every other month at the Virginia Port Authority (meet more frequently as needed)
    - Membership includes representatives from various sectors of the freight industry
    - Meetings include a five-minute public comment period
- Legislative Ad-Hoc Committee
    - Meetings held as needed
    - Membership includes appointed HRTPO Board members, including representatives from the Virginia General Assembly and elected officials from Hampton Roads localities, plus local legislative liaisons
- High Speed Intercity Passenger Rail (HSIPR) Task Force
    - Meetings held as needed
    - Membership includes appointed members of TTAC, plus representatives from local transit agencies, railroads, DRPT, and other regional stakeholders
- LRTP Subcommittee
    - Meetings held every two months (or more frequently as needed)
    - Comprised of members from TTAC

Media

- Extensive news coverage across TV, Radio, Print, and Digital Media
- Coverage of major transportation events (Carmageddon, High Rise Bridge stuck, Downtown Tunnel Closure)
- Coverage of transportation mobility needs (military, port, EJ populations)
- Coverage of transportation prioritization
- HRTPO Staff Interviews with media (WHRO, news outlets) on transportation

Surveys

- April-July 2009 surveys via public libraries and web to get ideas, broad and project specific (April thru July 2009)
    - Special emphasis was placed on distributing information to EJ communities via direct mailing to civic organizations located in EJ communities as well as focused outreach to regional libraries in EJ communities (which offer internet access to take survey)
- Surveys for determining weighting for prioritization (September 2009)

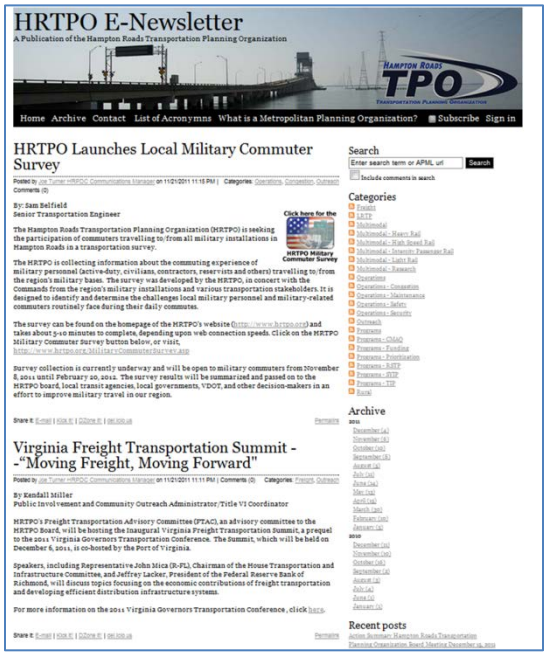


Figure 5.3: HRTPO E-Newsletter

Interagency Coordination

- SAFETEA-LU outreach: correspondence sent to environmental agencies in June 2010; received responses July 2010
- Coordination with the Hampton Roads Interagency Consultation Group (ICG) regarding 2034 LRTP project list and air quality conformity procedures and results

Newsletters

- HRTPO Newsletters were distributed quarterly through summer 2010, and is now published in an e-newsletter format.
    - 3,800 newsletters mailed quarterly (prior to e-newsletter format)
- Bi-monthly e-mailing of HRTPO update
    - 2100 recipients per issue

Citizens Guide

- Released October 3, 2011.

Project Prioritization Public Meeting

Additional

- Presentation by Mr. Andy Pickard to Old Dominion University graduate school class on Regional Planning (July 2010)
- Dr. Camelia Ravanbakht (HRTPO Deputy Executive Director) and Ms. Dale Stith attended an *Empower Hampton Roads* meeting at Hampton University in July 2010; Dr. Ravanbakht agreed to work together with Empower Hampton Roads
- Dr. Camelia Ravanbakht attended the Aging in Place Conference in October 2011
- HRTPO staff attended HSIPR public meetings
- Mr. Dwight Farmer (Executive Director) and Dr. Camelia Ravanbakht presented to numerous groups/organization around the region (See Public Involvement Appendix)

Comments Received

Citizens throughout the region are provided opportunities to review and comment on transportation priorities. As stated earlier, citizen input is provided to the HRTPO Board and its advisory committees so that citizen input is considered throughout the development of the LRTP. Numerous comments and questions were received at our public meetings, board and advisory meetings, and via email. See the end of this chapter for a summary of public comments received

Tables 5.1 and 5.2 on the following page are a summary of comments and questions received regarding the 2034 LRTP. Please see Public Involvement Appendix for individual public comments relating to the 2034 LRTP.


School Outreach Public Meeting

Table 5.1: Summary of Public Comments

Topic	Summary of Comments
Environment	Route 460 has potential to disturb pristine lands
	Transportation funding should be oriented towards clean energy mobility, GHG emission reductions, and clean water
	Route 460 has potential to increase runoff
Funding	Toll Virginia entry points; raise state gas tax
	Route 460 financial plan unfeasible
	Traveler avoidance of Route 460 with toll implementation
	Waive real estate taxes on rail track mileage
	Consult with federal representatives
Prioritization	Congestion Reduction methodology flawed (induced demand)
	Prioritization of projects should be all inclusive for the plan
	Prioritization of projects should emphasize economic vitality and safety
	Passenger rail projects were not prioritized
	Prioritization highlighted utility, viability, and vitality; important for economy and scarce funding
	Prioritization results need to show overall priority transportation projects, regardless of category
	Broad criteria should be consistently applied across project categories
	Criteria should be added/bolstered to emphasize environmental and land use impacts
	Prioritization results report over/underemphasized certain results
	Concern on the evaluation of PPTA projects in tool
Public Involvement	Ensure transportation investments have public support
	Ensure diverse public meeting locations
Public Private Partnerships	Emphasize development potential of transportation projects to developers

Table 5.1: Summary of Public Comments (Continued)

Topic	Summary of Comments
Transportation Investments	Include RTVP projects envisioned by 2035 into LRTP
	Widen current and provide new, redundant, interstate quality evacuation routes on the Peninsula and Southside Hampton Roads
	Elevate current Route 460 to mitigate roadway flooding
	Consider an alternate harbor crossing
	Consider a rail linkage across harbor
	Consider breaking up Passenger Rail project into phased improvements
	Consider the extension of Mooretown Road for emergency response
	Consider the closure of six at-grade rail crossings between Lightfoot and Croaker
	Consider developing an area served by two interstate exits and rail service
	Encourage multimodal passenger and intermodal freight transportation investments
	Consider investments in structurally deficient/functionally obsolete bridges and tunnels
	Consider investment in High Occupancy Toll Lanes

Table 5.2: Summary of Public Questions

Topic	Summary of Questions
Funding	Regulating trucking movement towards toll roads
	Total LRTP funding allocation
	LRTP funding source
	Public Private Partnership overview
LRTP Process & Considerations	LRTP Development Cycle
	Link between LRTP and TIP
	Environmental Justice considerations in the LRTP
	Topics discussed in LRTP
	LRTP implementation process
	LRTP objectives
	LRTP oversight/stakeholders
	Military considerations in the LRTP
Prioritization	Selection of candidate transportation projects
	Prioritization methodology/process
	Prioritization scoring and funding
	Freight considerations in methodology
	Locality consensus on methodology
Public Involvement	Opportunities for past/future public involvement
	Public involvement opportunities fairly distributed
Transportation Investments	Inclusion of multi-modal options on transportation projects
	Impact of harbor crossing options with US 460 project
	Considerations for a US 460 spur to Midtown Tunnel
	Rail track sharing among freight/passenger rail
	Regional Transit Vision Plan implementation
	Considerations of bicycle/pedestrian investments
	Public transportation operational improvements
	Impact of LRTP projects upon traffic volumes
	Transportation and Smart Growth

Imagine the year 2034 - what will Hampton Roads look like? Where will we live? How will we get around? What transportation choices will be available for the next generation?

Vision and Goals

Charting the course for future transportation investments is a daunting task for any region. The purpose of the 2034 LRTP is to chart the course for Hampton Roads. The 2034 LRTP must contain information regarding the current state of the region, ramifications of present day decisions, and the identification of a responsible investment strategy to improve the transportation outlook of regional development into the future.

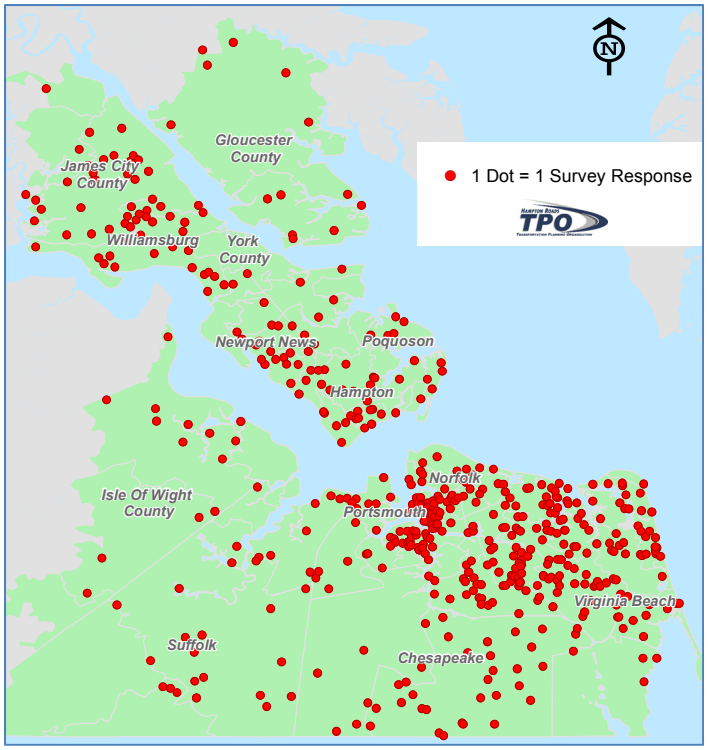
Guiding the development of the 2034 LRTP is the vision and associated set of goals. To define the 2034 LRTP vision and goals, the pulse of the region had to be taken. Using a survey[1], regional priorities were identified as the focus for the 2034 LRTP as the vision and goals were crafted.

Regional Priorities

As part of the development of the 2034 LRTP, the HRTPO conducted a survey between April and July 2009 to gather public input regarding regional priorities and concerns to help define a vision for the LRTP as well as identify transportation projects needed around the region. Respondents were asked to imagine the year 2034 in Hampton Roads and envision what the community would look like, how we would travel, and what transportation choices would be available for the next generation.

[1] The Regional Priorities survey was a non-scientific survey, as it did not involve random sampling.

Map 6.1: Survey Responses by Zipcode



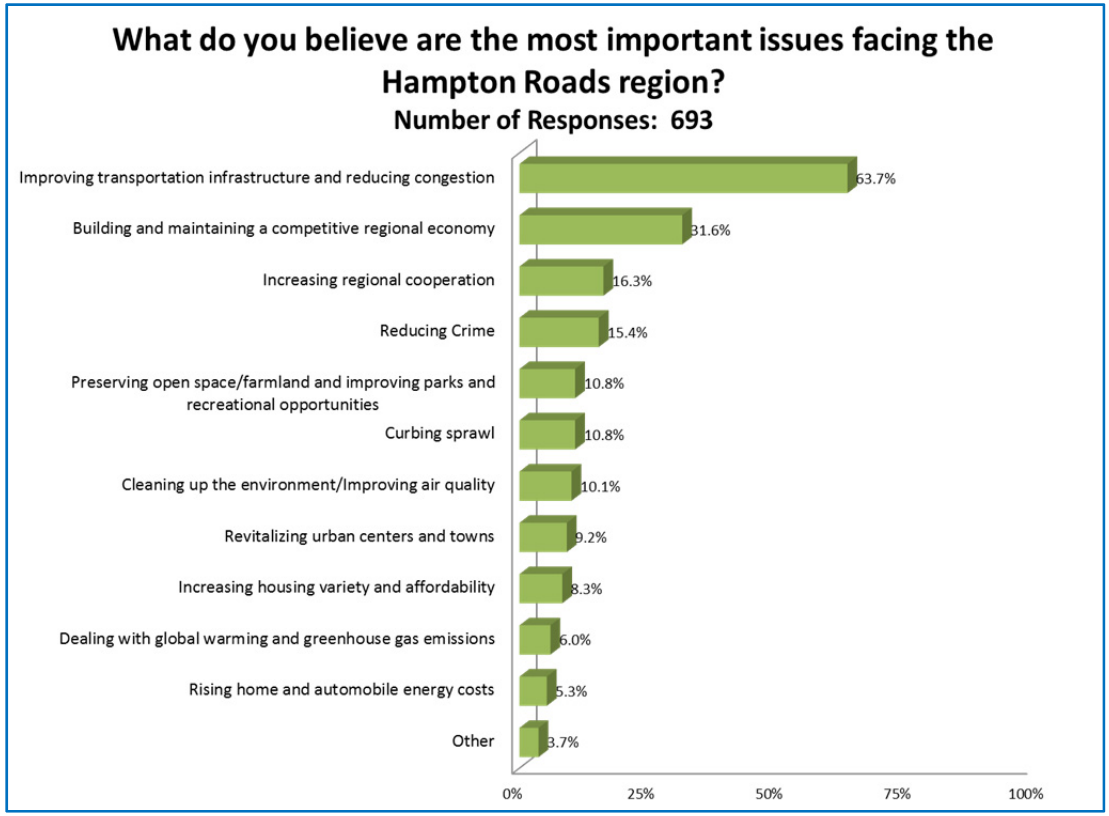
The web-based survey was distributed via email to over 3,000 recipients. Information was posted in regional libraries which offered internet access to residents who wished to participate in the survey. Additionally, postcards advertising the survey were mailed to local civic and community organizations. Staff also set up laptops at the Hampton Roads Regional Housing Consortium to provide another opportunity for residents to participate. Over

the three months that the survey was active, approximately 700 responses were collected from across the region.

Although transportation planning was the primary motivation for the survey, questions related to quality of life issues in Hampton Roads were also posed. Survey respondents chose "Improving transportation infrastructure and reducing congestion" as the most important issue facing the region, followed by "Building and maintaining a competitive regional economy." The relevance of transportation and the economy to our lives was reiterated by respondents choosing "Proximity to jobs and shopping" as the most important consideration in deciding where to live, followed by "Quality of schools" and "Sense of community." Respondents also desired a balance among transportation modes, choosing "Transit" and "Improved traffic flow" when asked what they would like to see more of in the region.

Responses to the survey were received from across the region (**Map 6.1**). These responses, along with input from regional stakeholders, were used to help define the vision and goals for the 2034 LRTP.

Figure 6.1: Example of Survey Responses



Federal, State Planning Priorities and the 2034 LRTP Goals

The vision of the 2034 LRTP looks to provide a safe, efficient, sustainable, and balanced multimodal transportation system for all users. To achieve this vision, thirteen goals were developed within the 2034 LRTP. These goals were drafted based on public input and refined by the goals and priorities as outlined by federal and state guidelines.

From the federal perspective, the Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEA-LU) legislation provides regulation and guidance for the federal surface transportation program. SAFETEA-LU includes eight planning factors[2], which need to be addressed in the region's long-range transportation planning process. SAFETEA-LU places attention to system management and preservation, economic vitality, mobility, environmental mitigation, safety, and security.

Ensuring consistency between regional and statewide priorities, the 2034 LRTP goals meet the statewide goals defined in VTRANS 2035, Virginia's long-range multimodal transportation plan. VTRANS 2035 identifies seven goals aimed at recognizing major investment priorities, as well as the development of strategies for Corridors of Statewide Significance, the multimodal connections between Virginia's activity centers. **Table 6.1** provides the relationship between federal, state, and regional transportation investment goals.

[2] 23 USC 134(h)(1)

Table 6.1: Federal, State, and 2034 LRTP Goals Relationship

SAFETEA-LU Planning Factors	VTRANS 2035 Planning Goals	2034 LRTP Goals
Supports the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency	Economic Vitality	Supports the economic vitality of the metropolitan area, enabling global competitiveness, productivity, and efficiency
Increases the safety of the transportation system for all motorized and non-motorized users	Safety and Security	Increase the safety of the transportation system for motorized and non-motorized users
Increases the ability of the transportation system to support homeland security and to safeguard the personal security of all motorized and non-motorized users		Provide for the security of the region's transportation infrastructure and its users
Protect and enhance the environment, promote energy conservation, improve the quality of life and promote consistency between transportation improvements and State and local planned growth and economic development patterns	Environmental Stewardship	Protect and enhance the environment, promote energy conservation, improve the quality of life, and reduce greenhouse gas emissions
	Coordination of Transportation and Land Use	Obtain compatibility between transportation improvements and planned land use and economic development patterns
Increase accessibility and mobility of people and freight	Mobility, Connectivity, and Accessibility	Increase accessibility and mobility of people and goods
Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight		Enhance the integration and connectivity of the transportation system, across and between modes, for people and goods
Promote efficient system management and operation	System Maintenance and Preservation	Optimize the efficient system management and operation of the regional transportation system
Emphasize the preservation of the existing transportation system		Increase the optimization, maintenance, and replacement of the existing transportation system
	Program Delivery	
		Enhance public involvement in the development of the region's transportation system
		Include a regional perspective among the transportation prioritization criteria
		Develop a long-range transportation plan that is fiscally constrained
		Work toward finding dedicated and sustainable revenue sources for transportation

Goal Attainment

In defining attainment benchmarks for the 2034 LRTP and its associated goals, specific and attainable approaches are outlined. Additionally, various measures of effectiveness gauge the performance of the 2034 LRTP. Evolving from the previous LRTP (2030), the vision, goals, approaches, and measures were developed in collaboration with stakeholders on the LRTP Subcommittee, with inclusive public input.

The goals developed for the 2034 LRTP serve as a foundation in which to formulate transportation investment strategies and projects. The goals aim to maximize the utility of transportation dollars within the guidance of state and federal strategies. Quantitative measures, technical approaches, and inclusive regional initiatives were identified in order to achieve the various 2034 LRTP goals. **Table 6.2** outlines the approaches and measures used to attain the 2034 LRTP goals. Specifics of these methods are introduced throughout the plan. The plan culminates with a quantitative analysis, using various identified performance measures. This analysis assesses the performance and impact of the 2034 LRTP as it navigates the region's transportation towards the future.

Table 6.2: 2034 LRTP Goals and Approach Strategy

2034 LRTP Goals	Approaches
Supports the economic vitality of the metropolitan area, enabling global competitiveness, productivity, and efficiency	Modal share (Trucks/Rail/Barge); Mean Travel Time to Work; Peak Period Travel Time Tax
Increase the safety of the transportation system for motorized and non-motorized users	Regional Safety Study (Crash/Injury/Fatality statistics)
Provide for the security of the region's transportation infrastructure and its users	Regional Evacuation Plan; Para-transit Services; Urban Area Security Initiative
Protect and enhance the environment, promote energy conservation, improve the quality of life, and reduce greenhouse gas emissions	Reduce Vehicle Miles Traveled; Enhance Alternate Modes of Transportation, Environmental Mitigation, Environmental Justice
Obtain compatibility between transportation improvements and planned land use and economic development patterns	Transportation Project Prioritization Tool, Regional Land Use Map
Increase accessibility and mobility of people and goods	Vehicle Hours of Delay; Transit Ridership
Enhance the integration and connectivity of the transportation system, across and between modes, for people and goods	Regional Transit Vision Plan; Intermodal Management Systems; TRAFFIX
Optimize the efficient system management and operation of the regional transportation system	Intelligent Transportation Systems; Travel Time Savings
Increase the optimization, maintenance, and replacement of the existing transportation system	Pavement/Bridge Condition; Travel Demand Management
Enhance public involvement in the development of the region’s transportation system	Public Participation Plan/Implementation
Include a regional perspective among the transportation prioritization criteria	Project Prioritization Process/Implementation
Develop a long-range transportation plan that is fiscally constrained	Maximization of funding streams; Transportation Project Prioritization Process
Work toward finding dedicated and sustainable revenue sources for transportation	Public/Private Partnerships; Tolls, Legislative Action; Local Contribution

Section 4 – Transportation Challenges

Mobility and Accessibility Challenges

Mobility and accessibility are key elements in transportation planning. For the purposes of the LRTP, mobility is defined as the ability to travel easily from Point A to Point B. Accessibility, on the other hand, is the ability to access the transportation network and/or destinations. In other words, mobility is about reaching a destination quicker (less congestion, less barriers); accessibility is more about reaching the transportation network as well as the transportation options available while traveling to a destination.

Generally speaking, mobility goals favor the motor vehicle whereas accessibility goals are often characterized as favoring walking, biking, and transit. Therefore, in long-range transportation planning, both mobility and accessibility challenges should be considered across all modes. There are, however, potential obstacles that could compromise achieving these goals. Regional mobility is hindered by congestion, and regional accessibility is constrained by both the topography and multiple water crossings of the area.

Mobility and accessibility challenges vary depending on the user's viewpoint. For example, the challenges faced by Special Needs Populations differ quite a bit from the Military or Freight communities. As such, the LRTP must acknowledge that needs differ among various users and hence, solutions should address these differences.

This section discusses the challenges faced by the following groups:

- Special Needs Populations
- Military
- Freight
- Modal Choices and Constraints

Challenges for Special Needs Populations

In Hampton Roads, there are several groups of the regional population that have a different perspective as it pertains to mobility and accessibility. These groups include:

- Elderly Population
- Medical/Functional Needs Population
- Zero-Vehicle Households
- Youth Population

Elderly Population

Highlighted in the 2000 Census and reaffirmed by the 2010 Census, the population of the United States, and that of Hampton Roads is graying. It is anticipated by 2030, nearly 19% of the regional population will be age 65 or older. With this aging of the region's population, mobility and accessibility challenges emerge as acute transportation issues.

Table 7.1

Census Year	Percentage of Hampton Roads 65+ Population
1990	9.07%
2000	10.21%
2010	11.45%

Source: US Census Bureau

As individuals age into their golden years, the likelihood of driving to meet mobility needs declines. Whether from rising medical/functional needs or the reduced desire to drive, the elderly population evolve into non-drivers (see **Figure 7.1**). Though the elderly non-drivers reduce their trips as a result of mobility limitations, it is not a signal of a reduced need for transportation mobility and accessibility. Instead, as this population becomes more reliant on others for transportation, their need for mobility and accessibility options increases.

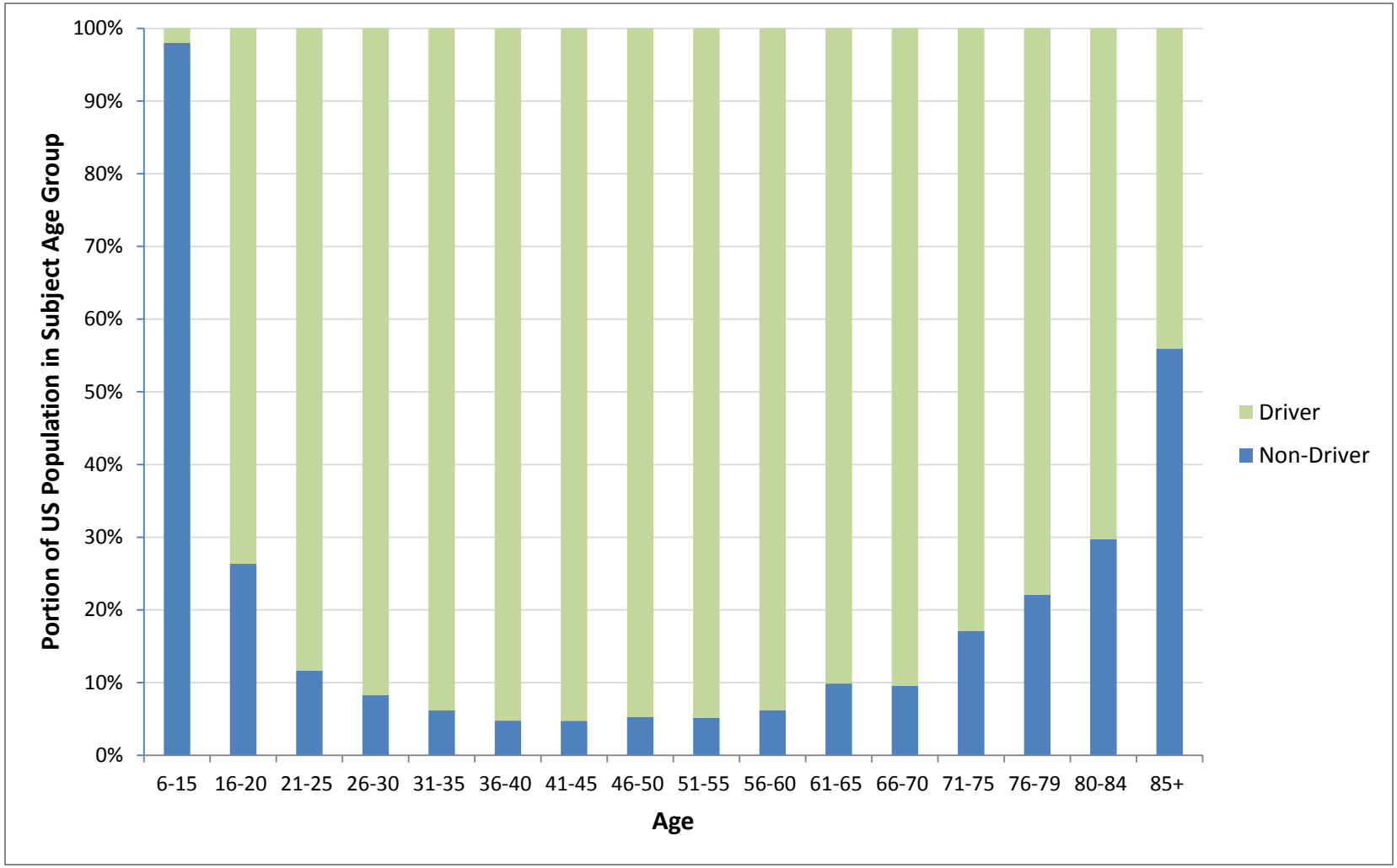
To meet their mobility needs and to bridge their 'mobility gap', the elderly often resort to non-motorized, public transportation, or carpool options. With these particular modes of transportation, accessibility challenges sometimes arise, such as:

- Limited transit stops
- Transit stops that are too far from the traveler's origin/destination

- Infrequent transit service
- Inconvenient transit service hours
- Sidewalks/bike paths are not complete (gaps in the networks)
- Low-density activity centers (having low-density activity centers often means travelers must make multiple stops as their destinations are not located in one area)

These challenges place an undue burden on elderly users, causing them to question the necessity of the trip.

Figure 7.1: Percent of Non-Driver Population vs. Percent of Driver Population



Note: Per a National Household Travel Survey (NHTS) in 2001, as individuals age, they tend to become non-drivers, depending more on rides from friends and relatives, as well as public transportation and non-motorized modes.

Medical/Functional Mobility and Accessibility

As the population continues to diversify and age, the number of individuals with medical/functional needs also continues to increase over time. According to the Census Bureau, 1 in 5 individuals have some form of medical/functional need.

Traveling to doctor appointments, grocery stores, or social events can prove to be a daunting challenge for individuals with medical/functional needs. Therefore, a portion of this population is reliant on non-motorized, transit, and paratransit (alternative mode of flexible passenger transportation that does not follow fixed routes or schedules) forms of transportation. This segment of the population faces some of the same accessibility challenges as the elderly. These challenges and limited transportation alternatives can impact the quality of life for this group.

Zero Vehicle Household Mobility and Accessibility

Whether by economic limitations or by choice, there are individuals in Hampton Roads who do not own an automobile and therefore, are reliant on alternative modes of transportation. In this region, just over 47,000 persons live in zero-vehicle households. **Map 7.1** on the following page provides a snapshot of the location of the region's non-drivers in zero-vehicle households.

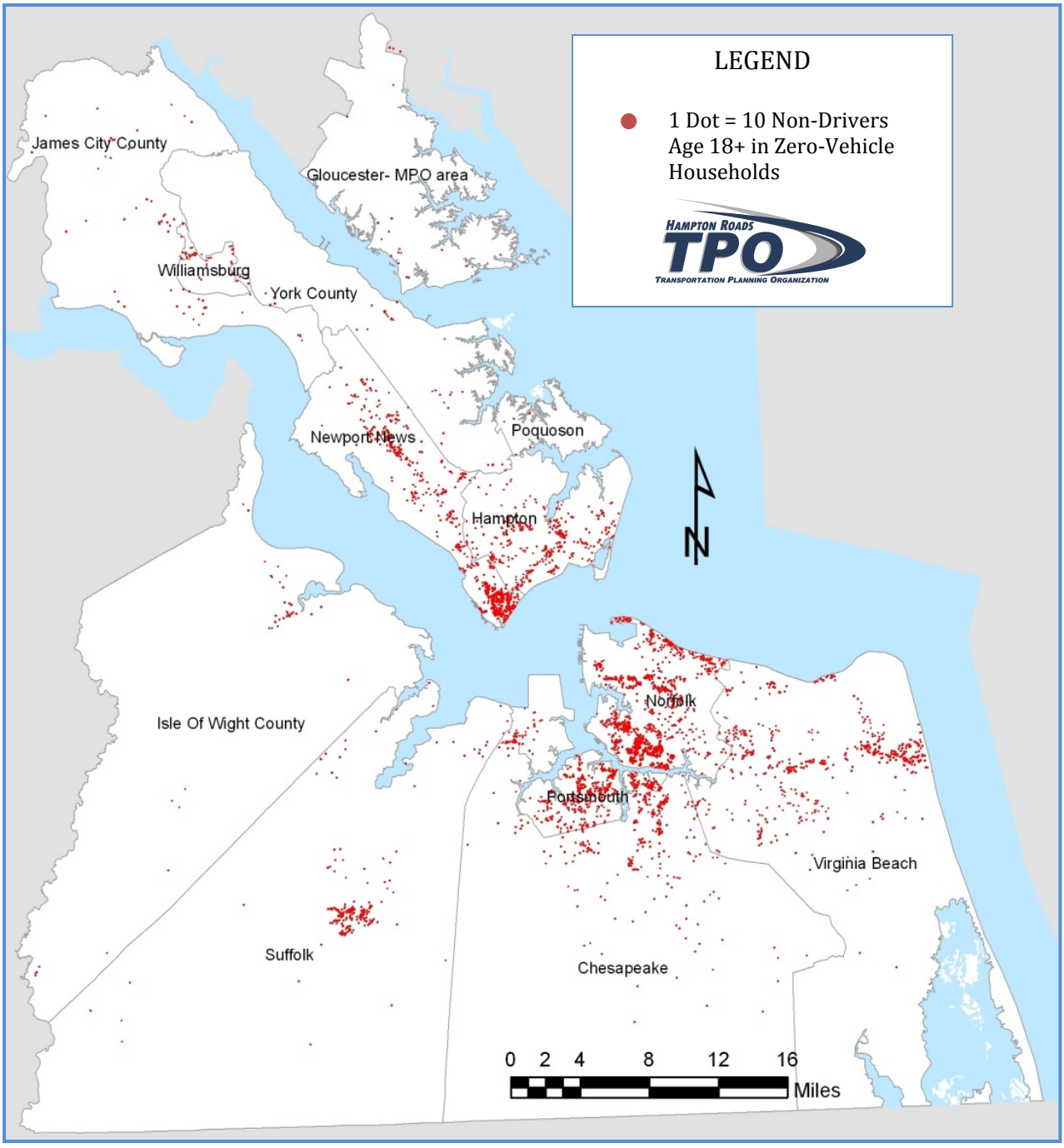
For some of these individuals, economic distress limits automobile ownership. The cost of owning, insuring, and maintaining an automobile has risen considerably over time; these costs have placed owning a vehicle out of reach for this segment of the population. Without the car, economically distressed zero-vehicle populations often attempt to reside in neighborhoods with a reasonable level of transit availability.

Some individuals who do not own automobiles do so by choice. Recent travel trends confirm that younger transportation users are more apt to prefer alternative modes of travel over the car. Citing the need to be environmentally, economically, and/or socially conscious, these individuals prefer walkable, mixed-use activity centers with multi-modal transportation options.

Table 7.2: Non-Drivers in Hampton Roads, 2000

By the Numbers, Hampton Roads in 2000	
47,101	Non-Drivers in Zero Vehicle Households
70,696	Non-Drivers in Households with Vehicles
117,797	Total regional Non-Drivers

Map 7.1: Zero Vehicle Non-Drivers in Hampton Roads, 2001



Youth Mobility

Transportation planning has historically focused on the adult transportation user, leaving the youth population underrepresented. In Hampton Roads, over 19% of the regional population is comprised of individuals less than 15 years old, or driving age.

Table 7.3

Census Year	Percentage of Hampton Roads Youth Population
1990	22.68%
2000	22.15%
2010	19.45%

Since these children are the future of the region, planning for youth transportation will impact not only how they travel today (to and from school, the playground, a friend's house) but also plants the seed for how they will travel as an adult on the future regional transportation system.

Efforts have recently been made at federal, state, and local levels of government to focus more efforts on youth transportation planning. The predominant trip that involves youth in the region is to and from school. The Safe Routes to School program encourages partnerships between parents, schools, and government to focus on multimodal transportation improvements for children traveling to and from school.

Figure 7.2: Safe Routes to School Program

The Safe Routes to School (SRTS) program is the partnership that aims to:

- Enable and encourage all children to walk and bicycle to school
- Make bicycling and walking to school safer and a more appealing transportation alternative
- Encourage an active lifestyle from an early age
- Facilitate the planning, development, and implementation of projects and activities that improve safety, reduce congestion, fuel consumption, and air pollution near schools

In Virginia, VDOT administers the Safe Routes to School program. Regionally, there have been several projects and programs implemented for the Safe Routes to School Program. **Table 7.4** documents the efforts in Hampton Roads enhancing youth mobility.

Table 7.4: Safe Routes to School Program Recipients, 2008-2010

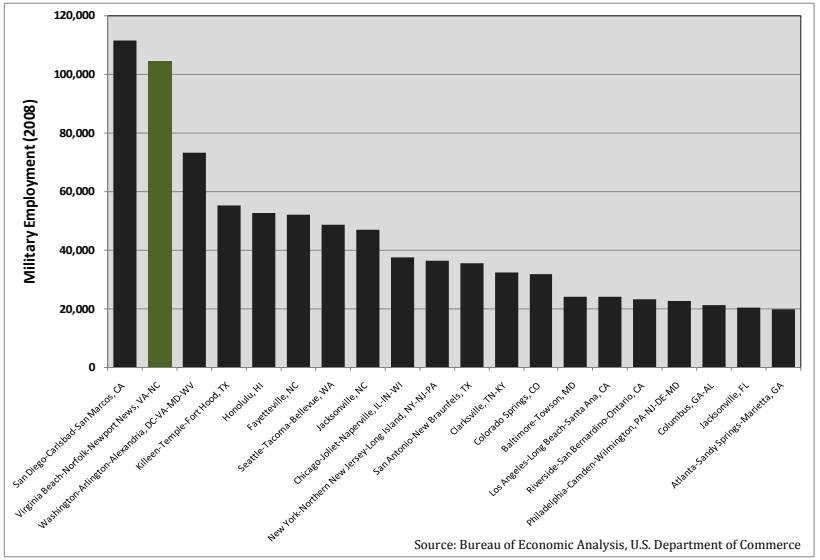
SRTS Grant Recipient	School	Project Description	Year
Portsmouth Public Schools	Park View Elementary	SRTS program implementation	2008
	James Hurst Elementary		
	Churchland Elementary	Sidewalk, bicycle racks, shared-use path, signage	2010
Virginia Beach Public Schools	Bayside Middle	SRTS plan development	2008
		Sidewalk and pedestrian signal upgrades	2010
Chesapeake Public Schools	Western Branch Intermediate	Curb extensions, pedestrian signal upgrades, sidewalk	2010
Williamsburg/ James City County Schools	James River Elementary	Intersection improvements, pedestrian signals, curb ramp upgrades	2010

Source: Virginia Department of Transportation.

Military Mobility

As stated previously, the Hampton Roads region contains one of the largest natural harbors in the world, making the region an attractive location for military facilities. The region's military presence is comprised of the Norfolk Naval Base, the largest in the world, and dozens of other military facilities, resulting in more than 110,000[1] active duty military personnel. As a result of the area's large military presence, much of the local economy is driven by the U.S. Department of Defense (DoD). According to 2008 Bureau of Economic Analysis data, Hampton Roads has the second highest concentration of military employment in the nation behind the San Diego, CA area (**Figure 7.3**).

Figure 7.3 – Top 20 U.S. Metro Areas by Military Employment, 2008



[1] United States Joint Forces Command (JFCOM), www.jfcom.mil, January 2011.

Efficient military operations require a reliable transportation network so that cargo and personnel can be moved as quickly and as safely as possible. Not only does the condition of the Hampton Roads transportation network impact the future viability of the region as a military hub, it also impacts national security as well.

Military Transportation Concerns

Several local military representatives (active and retired) recently provided oral[2] and written[3] statements to the HRTPO Board to give their perspective and to express their concerns regarding transportation in Hampton Roads. Some suggested that transportation congestion and problems may hinder the ability to maintain or bring additional military personnel to the region. They stated that local traffic congestion affects every day commuting for their military personnel as well as travel times between installations during business hours. Delays at existing bridges/tunnels significantly detract from mission performance effectiveness and efficiency. Specific locations mentioned were the Midtown Tunnel, Downtown Tunnel, and the Hampton Roads Bridge-Tunnel.

According to these military representatives, mobility, which is one of their primary keys to success, is currently impeded by insufficient local transportation infrastructure. Specific projects being considered for the 2034 LRTP noted to be of importance to the military were the I-564 Intermodal Connector, Air Terminal Interchange, South Norfolk Jordan Bridge, Midtown Tunnel, improved Harbor crossing (i.e. Third Crossing), I-64 corridor expansion, and a light rail extension to Naval Station Norfolk. Related to transportation mobility, these military representatives requested the region consider their ability to respond to a military crisis as well as their ability to evacuate in times of national defense emergencies or natural disasters.

These military representatives also requested consideration of time savings associated with high-speed and intercity passenger rail service connecting Hampton Roads to Richmond, Washington, D.C., and beyond. For example, a high-speed rail connection would allow military personnel and officials to conduct a full day's business in Washington, D.C. without an overnight stay.

Traffic safety is also important to the military as they value all service members. The military representatives expressed concern related to traffic congestion's impact on overall quality of life for service members and their dependents. They stated that local service members and their families who are routinely impacted by traffic challenges are less likely to spend additional tours of duty in Hampton Roads or consider this area for retirement. For this reason, it is important for the HRTPO to plan and implement transportation improvement projects that provide a safe and efficient transportation network for the military.

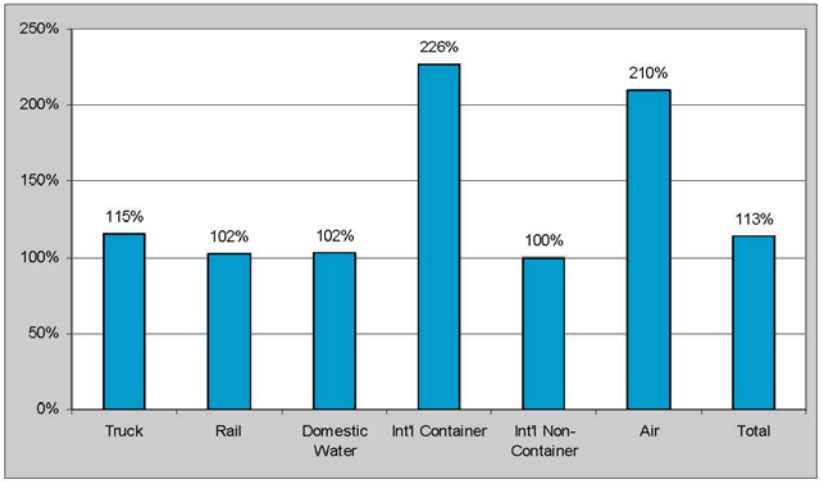
[2] HRTPO Board Meeting, December 16, 2009.
[3] HRTPO Board Meeting - Retreat, February 10, 2010.

Freight Mobility

Freight transportation influences every aspect of our daily lives and keeps our industries competitive in the global economy. Given the Internet Age we now live in, people are becoming more and more accustomed to buying and receiving goods in a convenient and timely fashion. This expectation and growing demand will require better connections and a more efficient transportation system.

According to the Federal Highway Administration's (FHWA) Freight Analysis Framework-3 (FAF-3), despite slight declines in national freight movement in 2008 and 2009, the overall tonnage of goods that will be moved throughout the country for all modes is expected to increase 61% between 2010 and 2040. Within Virginia, even larger growth is expected. By 2035, freight tonnage moved in Virginia is projected to increase 115% for trucks, 102% by rail, 102% by domestic water, and 100% for non-containerized international trades (**See Figure 7.4**).

Figure 7.4 – Projected Growth in Virginia Freight Tonnage, 2004 to 2035



Source: Virginia Statewide Multimodal Freight Study, Phase I (2007).

The Panama Canal Expansion will allow larger ships (traveling from Asia) which today use West Coast ports to use East Coast ports. This project, which is expected to be complete in 2015, will benefit the Port of Virginia since it is the only East Coast port that has the capability to support the larger ships utilizing the expanded canal. Some view the new influx of freight as a challenge, while others view it as an opportunity.

Port of Virginia Accessibility

According to a study done for the Virginia Port Authority, the Port of Virginia is one of the largest drivers of the Hampton Roads and Virginia economies, contributing to 343,000 jobs throughout the state of Virginia.[4]. At over 15 million tons of containerized cargo annually, the Port of Virginia currently ranks as the third largest port on the East Coast of the United States.

[4] Economic Impact Study: Port of Virginia, Compiled by William & Mary Mason School of Business, January 2008 http://portofvirginia.com/media/16804/finalvaeconimpactstudywithcover.pdf

Newport News and Norfolk terminals both have public transportation access within a half-mile for the benefit of their workers. Conversely, the Portsmouth and APM Terminals do not have reasonable public transportation access to their facilities. Similarly to the current scenario with public transportation, Newport News and Norfolk terminals have some bicycle and pedestrian facility accommodations to facilitate non-motorized commuting, whereas the Portsmouth and APM terminals do not have these facilities.

Modal Choices and Constraints

The current state of the region, highlighted earlier, notes a robust and multi-faceted transportation network. The various transportation modes are integrated for the movement of people and goods in and through Hampton Roads. However, there are various constraints that impact the modal choices in the regional transportation network.

Roadway Modal Choices and Accessibility

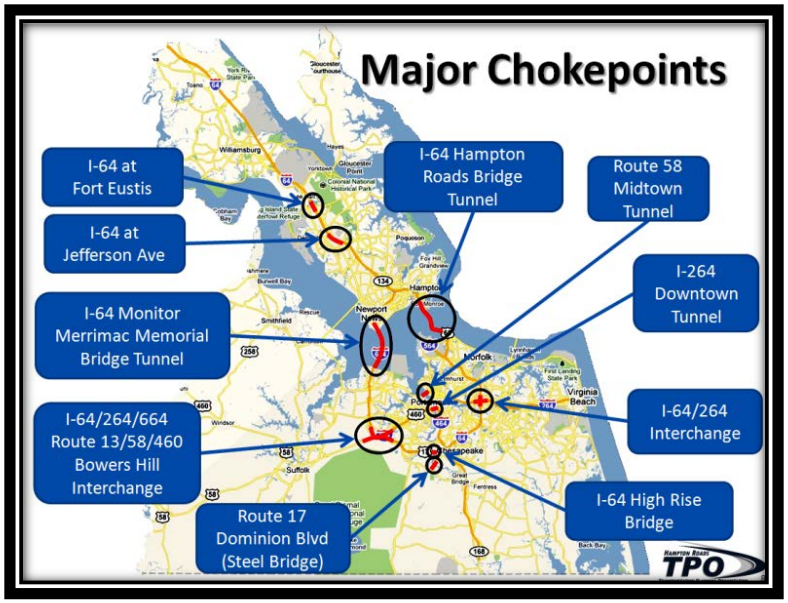
With over 19,000 lane miles, the regional roadway network provides mobility for people and goods across various motorized modes. Cars, trucks, and transit vehicles operate within the roadway network. Looking forward to 2034, in order to meet modal mobility demands in the region, network connectivity, congestion, and bottlenecks have to be considered.

Bottlenecks

Bottlenecks are identified as points in the regional transportation system where design and/or function limit the flow of traffic. Many of the bottlenecks in Hampton Roads involve crossing various bodies of water. The issue is compounded by the need to balance the flow of automobile traffic with maritime traffic. For example, the draw bridges across the James, Elizabeth, and York rivers open on a regular basis to allow boats to pass through, holding up automobile traffic.

Map 7.2 highlights some of the various bottlenecks that can be found in the region.

Map 7.2: Major Chokepoints



Congestion Impacts

Congestion is a major issue in Hampton Roads. Twelve percent of regional roadways are defined as severely congested and another 20 percent as moderately congested. As a result of congestion, economic considerations from regional businesses and national security considerations from the military emerge; deliberating whether to locate, expand, or even continue business/operations in the region.

For the average citizen, congestion has the potential to erode quality of life and job access. Congestions can limit employment opportunities and living arrangements. Regional commuters start to find themselves spending more time behind the wheel traveling to destinations, rather than engaging in activities at those destinations.

Transit Modal Choices and Accessibility

Public transportation in Hampton Roads consists of the bus, ferry, and light rail. As mentioned in Chapter 2, the regional transit nework has two transit providers (HRT and WATA) that oversee a network of approximately 3,400 bus stops, two ferry terminals, and 11 light rail stops.

The Brookings Institute released a report in 2011, highlighting the "supply side" of transit, transit's potential effectiveness in serving workers and employers, and accessibility of workers to jobs via public transportation. Within the report, it was identified that the regional public transportation system provides 67.1 percent of the regional working age population transit coverage within three-quarters of a mile of their place of residence. This ranked Hampton Roads 42nd among the 100 largest Metropolitan Statistical Areas (MSAs) in terms of transit coverage.

Service Coverage

In general, public transportation planners accept a half mile as an acceptable walking distance[5]. Assessing the current transit stop coverage across the region by area, only 15 percent of Hampton Roads is within a half mile of a transit stop. When assessing the current transit stop coverage across the region by total population, 59 percent of Hampton Roads is within a half-mile of a transit stop, as of 2009. **Table 7.5** and **Map 7.3** detail transit stop coverage across the region.

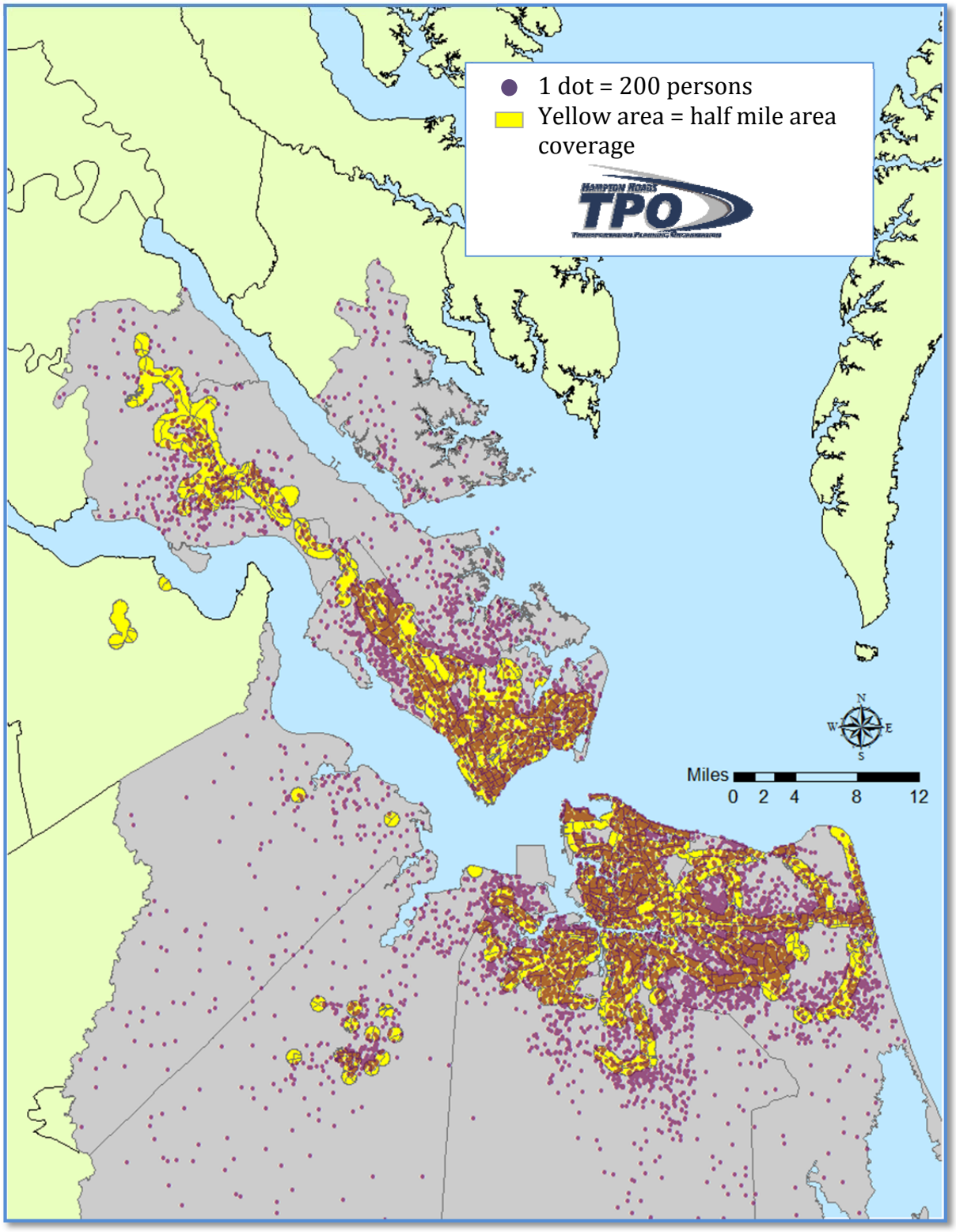
Table 7.5: Half-Mile Transit Stop Coverage

Locality	Half-Mile Transit Area Coverage	Half-Mile Transit Population Coverage
Chesapeake	10%	42%
Gloucester County*	<1%	<1%
Hampton	67%	82%
Isle of Wight County*	<1%	<1%
James City County	18%	36%
Newport News	55%	71%
Norfolk	87%	95%
Poquoson*	<1%	<1%
Portsmouth	55%	71%
Suffolk	4%	22%
Virginia Beach	26%	57%
Williamsburg	81%	90%
York County	9%	11%
Hampton Roads Region	15%	59%

***No Fixed-Route Transit Service**

5 Wu, C., & Murray, A. T. (2005). Optimizing Public Transit Quality and System Access

Map 7.3: Half-Mile Transit Stop Coverage, 2009



HRT Bus

Service Frequency

For the transit user, once they are at the transit stop, the concern of using the transit system turns to the question of *when the next bus/train will come* and *how long is the service running*. With approximately 90 bus routes in the combined public transportation system of Hampton Roads, the average peak hour (most congested hour of the day) service frequency is 16.6 minutes, ranking 69th among the 100 largest MSAs[6]. As the frequency between buses decreases (more time between buses), the likelihood of transit users switching to other modes of transportation increases.

Service hours vary depending on the transit route. For certain routes, public transit operates within the extent of the transit provider's operating hours, while other routes only run a portion of the day (i.e. peak service hours only, start service late, or end service early in the day). Limited resources and service demand prevent the provision of service on all routes for the entire service day. As a result, transit dependent riders are generally less likely to travel to destinations where routes do not operate for the entire day.

Non-motorized Modal Choices and Accessibility

In the Hampton Roads region, there are over 400 miles of bicycle facilities, and countless additional sidewalk miles for non-motorized mobility needs. Within the network, issues such as network gaps, safety and security, and support facilities reduce the accessibility of non-motorized modes of transportation.

Network Gaps

In Hampton Roads, not all bicycle and pedestrian facilities are inter-connected, nor do they always connect to activity centers. Due to varying standards in community development, certain bicycle and pedestrian facilities in the region are built only to the limits of the development as required or designed, and are not connected to the non-motorized network. The challenge moving forward will be in addressing these network gaps, not only within localities, but also across jurisdictional boundaries.

6 Source: Brookings Institution (2011). *Missed Opportunity: Transit and Jobs in Metropolitan America*.

Pedestrian/Cyclist Safety and Security

For non-motorized travelers to use a bikeway or a sidewalk, there should be an assurance that they will be able to travel safely and securely. From a safety point of view, pedestrians can encounter conflicts with other modes of transportation in a variety of ways, including:

- Lack of sidewalks
- Lack of buffer/protection from other modes of motorized transportation
- Lack of 'safety island' on wide streets
- Poorly maintained facilities

Bicyclist on Shore Drive

For a cyclist, safety conflicts can arise from:

- Lack of dedicated operating space (whether by a separate facility or extra wide roadway lanes)
- Lack of buffer/protection from other modes of motorized transportation
- Lack of curb cuts
- Poorly maintained facilities

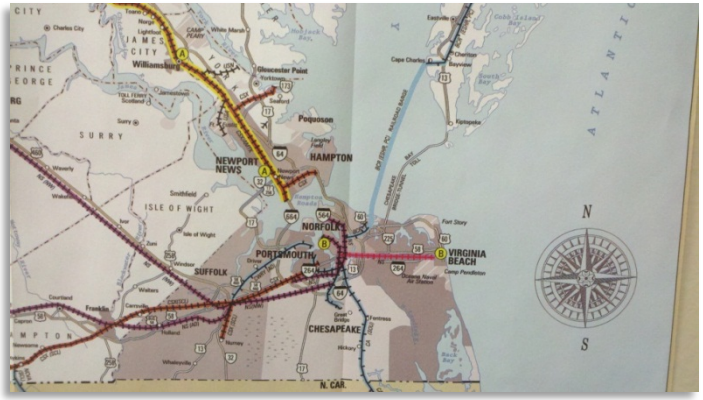
Non-motorized travelers limit their travel if the bicycle or pedestrian facility does not feel safe and/or secure.

Table 7.6

Hampton Roads Road/Pedestrian Crashes	Number of Incidents (2008-2010)	% of State Total
Crashes	989	25.3%
Injuries	1013	25.7%
Fatalities	32	16.8%

Table 7.7

Hampton Roads Road/Cyclist Crashes	Number of Incidents (2008-2010)	% of State Total
Crashes	299	28.1%
Injuries	295	32.4%
Fatalities	4	25.0%



Rail Modal Choices and Accessibility

Rail transportation is a critical component to the Hampton Roads transportation network. With the predominant aim of transporting goods to and from the Port of Virginia, regional rail is interconnected to provide maximum goods movement. Additionally, the rail network provides intercity passenger rail service connectivity with the rest of America.

The regional rail system is owned, operated, and maintained by private freight railroad companies. The majority of the system is single-tracked, operating similarly to a two-lane roadway. Because of the single-track rail system, bottlenecks occur at rail junctions, as well as cause congestion-related delay between trains. In addition, limited resources have prevented rail lines from crossing the Hampton Roads Harbor, further constraining regional rail connectivity.

Passenger Rail Challenges on a Freight Rail System

Passenger rail in Hampton Roads currently operates on an Amtrak Corridor (from Richmond to Williamsburg to Newport News) along the I-64/CSX freight railway. Due to the single-track rail system and associated bottlenecks prevalent in the region, passenger rail has to often endure significant delay. The bottlenecks result from conflicts between freight and passenger rail traffic on segments of the corridor with no option of a third track.

Rail Crossing Safety

The regional roadway network has over 500 rail crossings, of which approximately 85 percent are at-grade crossings (no separation between roadway and railroad tracks) [7]. These rail crossings can present potential safety and operations issues. In the past decade, various crossing improvements and grade separation projects have reduced the number of rail crossing crashes. **Table 7.8** notes the crash history at road/rail crossings in Hampton Roads in the past decade, as well as the trend from the prior decade.

For highly traveled corridors such as interstates and major arterials, grade separation treatment of the crossing is considered, and is evident in nearly fifteen percent of the regional rail crossings.[8] By separating the grade in the rail and road crossing, conflict-free traffic operations is possible, which in turn, reduces the number of roadway crashes at rail crossings. For other highly traveled rail grade crossings with no grade separation, roadway and rail signal and signage demarcate the crossings and temporarily impede roadway traffic as rail traffic traverses the crossing.

Table 7.8

Hampton Roads Road/Rail Crashes	Number of Incidents (2001-2010)	% of State Total	% Drop from Past Decade
Crashes	96	21.3%	40.4%
Injuries	21	14.9%	76.7%
Fatalities	3	13.6%	62.5%

Source: Virginia DMV

[7] FRA, Office of Safety Analysis (2011)
[8] FRA, Office of Safety Analysis (2011)

Reliability Challenges

Having a reliable transportation system is vital to a community. A strong and reliable transportation system efficiently moves goods to markets, people to work, children to school, and even consumers to the grocery store. In addition, the transportation network also provides a critical means of mobility for the region during emergencies. Therefore, it is essential to keep the network in a state of good repair.

Aging Infrastructure

As America ages, the condition of its infrastructure is becoming more of an issue. In many areas, roadways are crumbling, bridges are falling into disrepair, and transit vehicles are operated beyond their useful life. According to the American Society of Civil Engineers, $2.3 trillion is needed to maintain the aviation, road, bridge, waterway, rail, and public transportation systems throughout the country over the next five years, of which $1.4 trillion is unfunded. Aging infrastructure is an issue in Hampton Roads as well. Many roadways throughout the region were not built to today's standards, and the condition of other roadways is poor. Regional bridges and tunnels are aging as well, with two important water crossings being closed in recent years (Kings Highway Bridge and the Jordan Bridge).

Looking towards the future of the regional transportation network, stakeholders will have to assess the condition of existing infrastructure, how much farther the existing infrastructure's lifespan can be extended, and what investments will be needed to maintain system operations. Since Hampton Roads and Virginia must devote funds for the operation and maintenance of the existing transportation infrastructure before funding new projects, this will impact the amount of new transportation infrastructure that can be constructed.

Closed Kings Highway Bridge

Roadway Infrastructure Conditions

Nearly a quarter of all major roadways in Hampton Roads have pavement that is in poor condition. This information comes from the Urban Roads Report, which is regularly released by The Road Information Program (TRIP), an organization that researches, evaluates, and distributes economic and technical data on surface transportation issues.

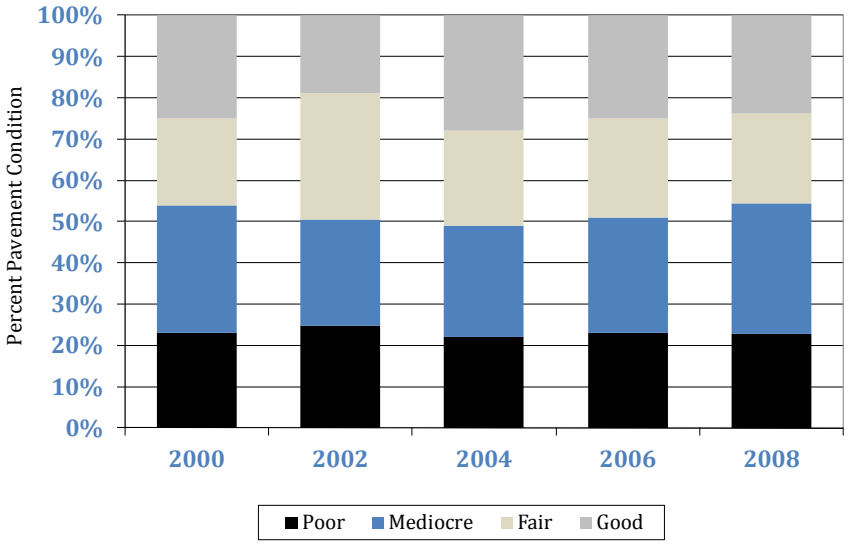
In Hampton Roads, 23 percent of major roadways had pavement that was in poor condition in 2008 according to TRIP. Thirty two percent of Hampton Roads roadways were rated as mediocre, 22 percent were rated as fair, and only 24 percent were rated as good. These percentages changed very little between 2000 and 2008, with the percentage of pavement in poor condition in Hampton Roads remaining between 22 percent and 25 percent of all major roadways. Among 35 large metropolitan areas with populations between one and three million people, Hampton Roads ranked 12th highest in terms of the percentage of regional roadways with pavement in poor condition in 2008.

The substandard condition of pavement has a cost to users as well, including: additional vehicle and tire repairs, higher fuel consumption, and additional vehicle depreciation. TRIP estimates that driving on roads in substandard condition cost each driver in Hampton Roads an additional $429 in 2008. This is slightly higher than TRIP's national average of $402.

Bridge & Tunnel Infrastructure Conditions

Water divides Hampton Roads into many sub-regions, making bridges and tunnels the most critical part of the transportation network. In fact, Hampton Roads has more lane-miles of bridges than all other metropolitan areas in Virginia and most other metropolitan areas throughout the country.

Figure 8.1 - Pavement Condition in Hampton Roads, 2000-2008

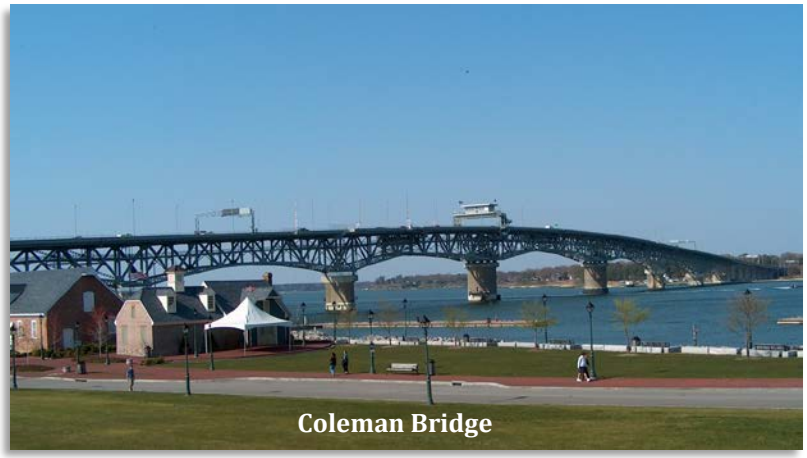


Source: The Road Information Program (TRIP). Data only includes interstates, freeways, and other principal arterials.

Regional Bridges

There are 1,214 roadway bridges[1] in Hampton Roads, ranging from culverts across small streams to the long spans across the Hampton Roads Harbor. Many of these bridges are aging; the median age of bridges in Hampton Roads is 36 years, and one out of every five bridges in the region is at least 50 years old. As mentioned previously, two bridges in the region, the Kings Highway Bridge and Jordan Bridge[2], were closed in recent years due to their deteriorated condition.

All bridges in Hampton Roads are inspected at least once every two years by qualified inspection teams. Based on these inspections, bridges may be classified as "structurally deficient" or "functionally obsolete."

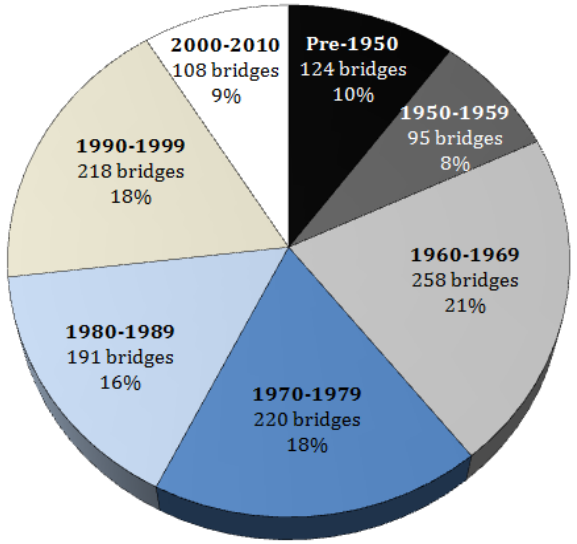


Coleman Bridge

[1] Bridges are defined by the National Bridge Inventory as any structure that carries or spans vehicular traffic on a public roadway and has a length of more than 20 feet. Bridges less than or equal to 20 feet in length are not included in these statistics, nor are bridges on military bases and private property.

[2] The Jordan Bridge is currently under construction and slated for reopening in 2012.

Figure 8.2 - Bridges in Hampton Roads by Year Built



Sources: VDOT, FHWA. Data as of August 2011.

Structurally deficient bridges are structures with elements that need to be monitored and/or repaired. They typically require maintenance and repair and eventually need to be rehabilitated or replaced to address deficiencies. Structurally deficient bridges, however, are not necessarily unsafe, and bridge inspectors close or impose limits on any bridge that is unsafe.

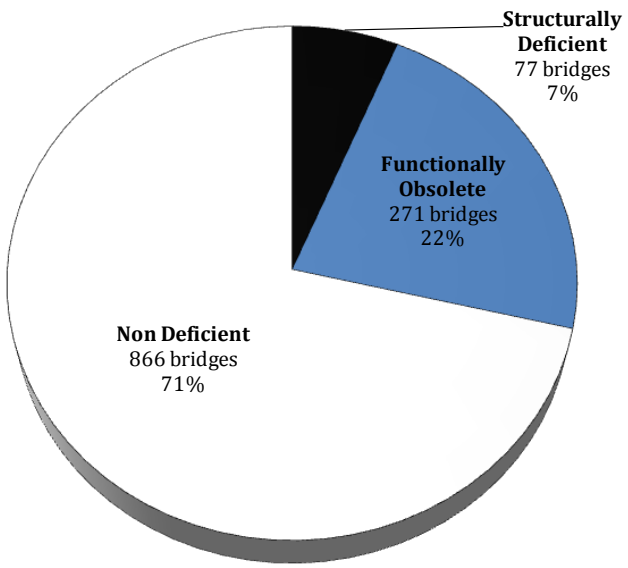
Functionally obsolete bridges are structures that were built to standards that are no longer used today. These bridges have narrow lanes, no shoulders, low vertical clearances, difficult approaches, or may occasionally be flooded.

To limit confusion, bridges cannot be classified as both structurally deficient and functionally obsolete. Instead, structures that could be classified as both are classified as structurally deficient (this being the more severe of the two classifications). Of the 1,214 bridges in Hampton Roads, 77

bridges (7 percent) are classified as structurally deficient as of August 2011 (**Figure 8.3**). These 77 bridges are shown in **Table 8.1** on the following page. Another 271 bridges (22 percent) in Hampton Roads are classified as functionally obsolete. Combined, 348 bridges, or 29 percent of all bridges in Hampton Roads, are deficient.

Compared to other metropolitan areas, the percentage of structurally deficient bridges in Hampton Roads is not high. Hampton Roads had the 25th highest percentage of structurally deficient bridges among 35 large metropolitan areas with populations between one and three million people as of August 2009. Hampton Roads ranks much higher; however, in terms of functionally obsolete bridges. Hampton Roads ranked 7th highest among the 35 large metropolitan areas in terms of the percentage of functionally obsolete bridges in August 2009.

Figure 8.3 - Deficient Bridges in Hampton Roads



Sources: VDOT, FHWA. Data as of August 2011.

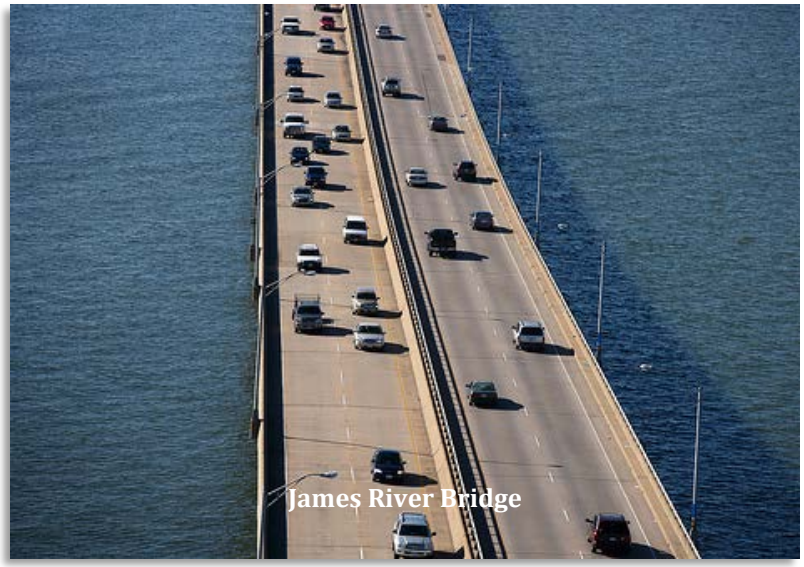


Table 8.1 - Structurally Deficient Bridges in Hampton Roads

FEDERAL BRIDGE NUMBER	ROUTE NUMBER	FACILITY	CROSSING	YEAR BUILT
CHESAPEAKE				
21879	166	22nd St	Seaboard Ave & N/S Railway	1938
21802		Beaver Dam Rd	Drainage Ditch	1973
21811		Bells Mill Rd	Mill Creek	1974
21797		Centerville Tpke	Chesapeake & Albemarle Canal	1955
21799		Indian Creek Rd	Indian Creek	1972
21827	13	Military Hwy	Bainbridge Blvd & N/S Railway	1948
21830	13	Military Hwy	N/S Railway	1938
21829	13	Military Hwy	Southern Branch Elizabeth River	1938
21937	460	Military Hwy Ramp	Bainbridge Blvd	1948
GLOUCESTER				
8552	662	Allmondsville Rd	Fox Creek	1937
8535	602	Burke's Pond Rd	Burkes Pond	1940
8545	627	Cunningham Ln	Wilson Creek	1963
8533	198	Dutton Rd	Harpers Creek	1941
8538	610	Old Pinetta Rd	Coffee Creek	1960
10588	14	Route 14	Porpotank Creek	1938
8548	641	Tidemill Rd	Northwest Branch Sarah Creek	1974
HAMPTON				
20294		Bridge St	Salters Creek	1934
20352	64	I-64 EB HRBT	Hampton Roads Harbor	1974
20366	167	LaSalle Avenue	Tide Mill Creek	1965
20296		Power Plant Pkwy	I-664	1983
ISLE OF WIGHT				
10365	58	Carrsville Hwy	Rte 632 & CSX Railway	1936
10371	258	Courthouse Hwy	Champion Swamp	1932
10424	644	Fire Tower Rd	Pope Swamp	1948
10427	646	Garrison Rd	Burnt Mill Swamp	1945
10443	691	Jamestown Ln	CSX & N/S Railway	1938
10414	637	Jones Town Dr	Rattlesnake Swamp	1945
10402	621	Mill Swamp Rd	Passenger Swamp	1945
10415	637	Orbit Rd	Great Swamp Branch	1945
10438	680	Stalling Creek Rd	Stallings Creek	1952
29488	662	Whippingham Parkway	Ragged Island Creek	1970
JAMES CITY				
24057	31	Jamestown Rd	James River Ferry	1994
10476	31	Jamestown Rd	Powhatan Creek	1957
NEWPORT NEWS				
20727	173	Denbigh Blvd	I-64 and CSX Railway	1965
20679	60	Warwick Blvd	Lake Maury	1931
NORFOLK				
20805	58	Brambleton Ave WB	Hampton Blvd	1962
21039	460	Granby St	Mason Creek	1936
20856	64	I-64 EB On Ramp	Northampton Blvd	1967
20939	168	Tidewater Dr	N/S Railway	1960

FEDERAL BRIDGE NUMBER	ROUTE NUMBER	FACILITY	CROSSING	YEAR BUILT
PORTSMOUTH				
21199	17	High St	Western Branch Elizabeth River	1951
21217	239	Victory Blvd	Paradise Creek	1944
SOUTHAMPTON				
17785	615	Adams Grove Rd	Browns Branch	1932
17821	640	Berea Church Rd	Branch	1932
17841	653	Carys Bridge Rd	Nottoway River	1954
17854	665	Cross Keys Rd	Deal Swamp	1975
17865	671	General Thomas Hwy	Nottoway River	1960
17812	634	Indian Branch Ln	Indian Branch	1932
9139	730	Low Ground Rd	Meherrin River	1953
17773	609	Meherrin Rd	Branch	1979
17724	35	Route 35	Nottoway River	1929
17727	35	Route 35	Tarrara Creek	1946
17729	58	Route 58 EB	Nottoway Swamp	1930
17755	189	Route 189	Blackwater River	1940
17853	663	The Hall Rd	Flat Swamp	1968
17757	308	Three Creek Rd	Three Creek	1948
17826	645	Trinity Church Rd	Indian Branch	1932
17813	635	Tucker Swamp Rd	N/S Railway	1915
17849	659	Vicks Millpond Rd	Flat Swamp	1932
17855	665	White Meadow Road	Tarrara Creek	1974
SUFFOLK				
22027	32	Carolina Rd	Cypress Swamp	1924
22121	639	Lake Cahoon Rd	N/S Railway	1962
22137	660	Longstreet Ln	Somerton Creek	1968
22132	643	Manning Bridge Rd	Stream	1945
22111	616	Mineral Springs Rd	Jones Swamp	1955
22091	337	Nansemond Pkwy	Beamons Mill Pond	1920
22151	669	Robbie Rd	Mill Swamp	1955
22107	608	Simons Dr	Cohoon Creek	1945
22159	688	Turlington Rd	Kilby Creek Spillway	1957
SURRY				
18187	604	Goodrich Fork Rd	Terrapin Swamp	1932
18304	603	Three Bridges Rd	Blackwater River	1932
VIRGINIA BEACH				
22239	264	I-264	First Colonial Rd	1967
22228	264	I-264	Lynnhaven Pkwy	1967
22224	264	I-264	Rosemont Rd	1967
22252	58	Laskin Rd	Linkhorn Bay	1938
22260	60	Shore Drive EB	Lynnhaven Inlet	1958
22264	60	Shore Drive WB	Lynnhaven Inlet	1967
22187		S Lynnhaven Rd	London Bridge Creek	1966
YORK				
		Yorktown Tour Rd	Beaverdam Creek	1975

Sources: VDOT, FHWA. Data as of August 2011.

Regional Tunnels

There are five underwater tunnel complexes in Hampton Roads: the Downtown Tunnel (I-264), Midtown Tunnel (US 58), Hampton Roads Bridge-Tunnel (I-64), Monitor-Merrimac Memorial Bridge-Tunnel (I-664), and the Chesapeake Bay Bridge-Tunnel (US 13).

Keeping these important structures in operation is critical. The traffic problems which followed events such as the flooding of the Midtown Tunnel during Hurricane Isabel in 2003 and a burst pipe closing the westbound Hampton Roads Bridge-Tunnel for many hours in 2009 confirm this. This is complicated by the fact that the average age of the underwater tunnels in Hampton Roads is 42 years. The oldest tunnels in the region, the westbound Downtown Tunnel and the westbound Hampton Roads Bridge-Tunnel are over 50 years old.

All tunnels in Hampton Roads are inspected regularly by qualified inspectors, and VDOT engages in a continual operations and maintenance program. The regional tunnel maintenance and operations program includes maintaining and replacing safety and operation systems such as fire suppressant, flood prevention, and drainage systems; replacing tunnel roof panels; upgrading lighting; and improving pavement/structural components.

Other Infrastructure Conditions

Pedestrian and Bicycle Infrastructure

The bikeway and pedestrian network infrastructure condition is difficult to assess, with no region-wide inventory of this network available. Many of the bikeways in Hampton Roads have been constructed in recent years and would be expected to be in good condition. It is expected that newer activity centers would include sidewalks in good condition, per recent local and state guidelines. The pedestrian network in older urban cores has varied conditions, based on when the facility was built.

Rail Infrastructure Conditions

The regional rail network on which freight and passenger rail operations are conducted is maintained by private freight rail companies, and as such, information regarding the condition of rail infrastructure is largely private. However, in many cases, both public and private money, are used to improve rail infrastructure.

As freight and passenger rail demands increase in Hampton Roads, various rail infrastructure issues will need to be addressed. Among these issues are deferred maintenance (acute among shortline rail carriers), increasing wear and tear from heavier rail cars, growth in freight movements, increased passenger traffic on shared highway and rail corridors, and denser development.

Security and Critical Infrastructure Protection

Hampton Roads is vulnerable to potentially catastrophic events including hurricanes, flooding, and even terrorism. If any of these events were to occur, a reliable transportation system will be crucial in evacuation scenarios and disaster response.

However, due to the physical constraints of the region, transportation options are limited. Construction and maintenance costs associated with water crossings are extremely expensive; therefore, in order to make efficicient use of financial and environmental resources, the region maintains only necesasary crossings. As a consequence, if a facility shuts down or experiences reduced service, remaining facilities, which are already working at maximum capacity, will be further compromised. This would complicate any needed evacuation plans or disaster response. In addition to these immediate transportation impacts, a shutdown of our system can also cause cascading disruptions to other sectors such as: the economy (including loss of wages), goods movement (including the Port of Virginia), and emergency response.

To further highlight the importance of a reliable transportaton system, Hampton Roads is home to the largest naval base in the world. A compromised transportation system can negatively impact the military's ability to carry out its mission or respond to a national security threat.

Figure 8.4 highlights the various hazards to Hampton Roads, of which several can impact transportation. Within the listing, hazards are categorized by risk (likelihood of the hazard occurring in the region.

Figure 8.4: Critical Hazard Risk Assessment in Hampton Roads

CRITICAL HAZARD - HIGH RISK	Hurricanes and Tropical Storms
	Winter Storms and Nor'easters
	Sea Level Rise and Land Subsidence
	Floods (100-Year)
CRITICAL HAZARD - MODERATE RISK	Hazardous Materials Incidents
	Tornadoes
	Severe Thunderstorms and Hail
	Lightning
	Floods (Storm Surge)
	Tsunamis
NONCRITICAL HAZARD - LOW RISK	Urban Fires
	Wildfires
	Droughts
	Dam Failures
	Shoreline Erosion
	Earthquakes
	Extreme Heat
	Mosquito Borne Diseases
	Terrorism
	Biological Threats
	Radiological Threats

Source: HRPDC

CARMAGEDDON: A traffic nightmare in Hampton Roads, July 2, 2009


The Virginian-Pilot

VDOT closes HRBT's westbound lanes for most of the day because of flooding.

Motorists stew in miles-long backups throughout the region.

Local leaders criticize VDOT's reaction, call for road upgrades.

CARMAGEDDON

DYING OF CANCER AND EXHAUSTED BY THE RED TAPE

For the Fourth

New Town Point

Everywhere all the time!

"Whatever works for you!"

Prudential

On July 2, 2009, several incidents around our region's water crossings led to a traffic nightmare for residents and visitors alike. This event, referred to by local newspapers as "Carmageddon," included either the closure of or severe delays at several of the region's critical water crossings, including the Hampton Roads Bridge-Tunnel (HRBT), the High Rise Bridge, the Monitor Merrimac Memorial Bridge-Tunnel (MMMBT), the James River Bridge (JRB), the Chesapeake Bay Bridge-Tunnel (CBBT), and roadways between the two Elizabeth River tunnels (Downtown Tunnel and Midtown Tunnel).

At the HRBT, an eight-inch portion of the fire water main that runs underneath the roadway surface in the tunnel burst, causing approximately 2 million gallons of water to flow into the duct and chamber located beneath the roadway surface of the tunnel. Consequently, the westbound tunnel was shut down so crews could pump out the water.

Normally, when one water crossing shuts down, travelers simply detour to another water crossing. However, on this particular day, options were limited for travelers. In addition to the west bound closure of the HRBT, there were three Berkeley Bridge openings, a one-car accident on the High Rise Bridge, and a three-car accident in the northbound tunnel of the MMMBT. To further complicate matters, a power line fell at the south entrance to the JRB and a tractor trailer overturned on the CBBT and movement between the two Elizabeth River tunnels was slowed by the closing of Waterside Drive in the City of Norfolk for the opening of Harbor Fest.

A system failure of this nature, although rare, exposes the region's vulnerabilities and lack of mobility options. In order to properly address potential evacuation scenarios, disaster response mitigation will need to take into account the region's unique geographical challenges in developing a more reliable, safe, and efficient regional transportation system.

Environmental Challenges

Hampton Roads is home to many natural resources, including woodlands, wetlands, rivers, and shorelines. These resources provide both economic and environmental benefits as tourist attractions, recreational areas for residents, and habitat for wildlife and marine life. Protecting and preserving these resources while balancing them with growth is a key strategy for promoting sustainable regional growth and development.

Challenges that Hampton Roads will face in protecting these resources include: maintaining water and air quality, protecting sensitive areas, and adjusting to the impacts of climate change on the region. These issues will place particular stress on the planning, construction, maintenance, and operation of transportation infrastructure and services in the region.

Water Quality

Hampton Roads is defined by its relationship to the water. Industrial facilities such as shipyards and ports line the Elizabeth and James Rivers, while military facilities are found along every major shoreline in the region. Tourism, a major economic sector in the region, relies largely on the oceanfront and rivers throughout the area to act as magnets for visitors. The region also has strong cultural and economic ties to water-based industries such as oyster harvesting, fishing, and crabbing. Water quality can be impacted by excessive nutrient and sediment runoff caused by development and construction; therefore, runoff must be monitored and its negative impacts minimized.

Transportation is a key contributor to water quality issues because it can increase nutrients to water bodies in multiple ways. Construction of roadways generates sediment runoff that delivers nutrients to nearby waterbodies. Debris and oil deposited on roadways are also delivered to waterbodies during rain events. Additionally, motor vehicles that travel the roadways release nitrogen into the air through tailpipe emissions; this nitrogen then falls to the ground or directly enters waterbodies with precipitation.

Newport News Shipyard

Air Quality

Maintaining clean air in Hampton Roads is an important issue as air quality affects the health and well-being of residents, workers, and visitors in the region. Air pollution can irritate the eyes, nose, and throat; it can even trigger respiratory problems. Air pollution can also damage both the natural environment (trees, plants, crops) and the built environment (buildings, bridges, monuments)

Exhaust fumes from motor vehicles are responsible for contributing to greenhouse gases[1] that erode regional air quality. To address this issue, Congress amended the Clean Air Act in 1990 to require "transportation conformity" of all regional transportation plans. In other words, transportation projects must be consistent with state air quality goals. More importantly, transportation projects cannot contribute to new air pollution violations. Transportation Conformity will be discussed in further detail in Chapter 19.

[1] Greenhouse gases include carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), nitrogen oxides (NO_x), and ozone (VOC).

Climate Change

Climate change presents a long-term challenge with the potential to negatively affect the region's infrastructure, economy, population, and environment. In 2009, the U.S. Global Change Research Program[2] released *Global Climate Change Impacts in the United States*, a summary of the causes, effects, and impacts of climate change. The report found that climate change, caused primarily by the burning of fossil fuels, is already occurring, resulting in higher temperatures, increased precipitation, and rising sea levels.[3]

Environmentally Sensitive Lands

Maintaining the quality of environmentally sensitive lands is an important part of the region's overall natural resource conservation strategy. However, new construction and development can stress or harm these areas. Transportation infrastructure, in particular, can have large impacts on where and how development occurs in the region, and how this development can impact environmentally sensitive lands.

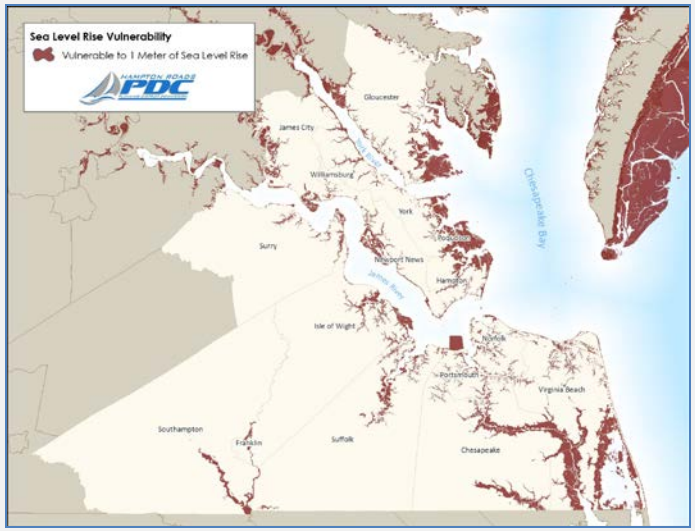
[3] Global Climate Change Impacts in the United States, Thomas R. Karl, Jerry M. Melillo, and Thomas C. Peterson, (eds.). Cambridge University Press, 2009.

Sea Level Rise

According to the Virginia Governor's Commission on Climate Change Final Report: *A Climate Change Action Plan*[4], sea level rise poses a serious threat to transportation infrastructure, such as roads, railways, and ports in vulnerable areas and could have the greatest impacts on transportation facilities in Virginia. Some coastal areas may be permanently inundated, while others may be exposed to regular tidal flooding.

Sea level rise has been documented in Hampton Roads by direct observation for over 80 years.[5] Some roads in the region are already rendered unusable during storm events or higher tides. Sea level rise could increase the frequency of road or bridge closings due to either tidal or storm flooding. Hampton Roads is currently vulnerable to extensive flooding during hurricanes and Nor'easters. A study by the Hampton Roads Planning District Commission found that nearly five hundred miles of roads in the region are vulnerable to flooding during Category 1 hurricanes.[6]

Map 9.1: Sea Level Rise Vulnerability in Hampton Roads




Flooding in Portsmouth

[4] The Governor's Commission on Climate Change Final Report: *A Climate Change Action Plan*, 2008, http://www.deq.virginia.gov/info/climatechange.html

[5] The National Oceanic and Atmospheric Administration has maintained a tidal gauge at Sewell's Point in Norfolk, VA since 1927. See tidesandcurrents.noaa.gov

[6] *Climate Change in Hampton Roads Phase II: Storm Surge Vulnerability and Public Outreach*, Hampton Roads Planning District Commission, 2011, http://www.hrpdcva.gov/Documents/Phys%20Planning/2011/HRPDC_ClimateChange2010_FINAL.PDF

Land Use and Transportation

Land use and transportation planning are directly correlated and interdependent. Roadways, railroad corridors, airport locations, and waterways influence land development patterns, while the distribution and types of land uses affect transportation systems and mobility options.

Up to this point, the challenges presented in this section discuss how transportation either impacts or is impacted by the environment. Land use alone is not necessarily an environmental challenge. The real challenge is better integration of land use and transportation planning; a lack of integrated planning can have environmental implications.

From a transportation perspective, growth itself is not the issue; instead, where and how growth will occur is the critical component. In other words, the type and distribution of growth impacts the transportation system differently. Since the relationship between land use and transportation planning is integral, better coordination between the two planning perspectives will help to minimize impacts to the environment.

The key challenge moving forward will be to better integrate land use and transportation planning. New federal programs and policies are now strongly encouraging multidisciplinary and coordinated approaches to development. This improved integrated planning will help maximize benefits of development while minimizing the negative impacts to the region's natural and financial resources; in essence, helping the region to get the most 'bang for its buck.'

Figure 9.1: Land Use and Transportation Impacts in Hampton Roads

Financial Challenges

As with the rest of the nation, the Hampton Roads region has experienced major impacts from the December 2007 recession. The housing market continues to struggle with lower home values, increased foreclosures, and an abnormally large inventory of homes. Gasoline prices remain high, averaging between $3.00 and $4.00 per gallon. Regional unemployment has increased as a result of the recession and major employers, including Ford Motor Company and International Paper, closed their Hampton Roads facilities.

This economic strain has compounded the already present shortfalls in transportation funding. Limited traditional transportation revenue, the uncertainty of a dedicated transportation funding stream at the national level, and the lack of said stream at the state level have resulted in a bleak financial forecast for transportation.

National Transportation Funding Challenges

Part of the funding for the Hampton Roads transportation network originates at the Federal level. Federal transportation funding, administered by the US Department of Transportation, is generated from user fees – motor fuel and motor vehicle taxes – applied nationally and distributed to states and transit agencies by formula. Since 1956, these taxes have been allocated to the Highway Trust Fund (HTF), a fund dedicated to the maintenance, improvement, and expansion of the national transportation system.

The U.S. Congress has provided continuing authorization of the HTF via various multi-year transportation reauthorization bills. Presently, the *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users* (SAFETEA-LU) is the authorization that governs the Nation's federal surface transportation funding. Authorized in August 2005, SAFETEA-LU represents the largest surface transportation investment in our Nation's history and provides funding totaling $244.1 billion for the interstate highway system, transit systems, bicycle and pedestrian facilities, and freight rail operations. SAFETEA-LU was originally set to expire on September 30, 2009, but has been extended multiple times as Congress continues to deliberate on a new surface transportation reauthorization bill.

The most difficult issue to be considered by policymakers during reauthorization is how to finance transportation into the future while maintaining fiscal stability. The HTF and the revenue sources that support it have been reliable mechanisms for financing highway and transit programs for five decades; however, with technological advancements in the auto industry, more fuel efficient cars are being developed. As a result, these more efficient cars consume less fuel and therefore, less fuel tax is collected. Consequently, fuel taxes, which currently provide most of the revenue for surface transportation, are unlikely to continue to provide a stable and lasting foundation to improve and maintain the Nation's highway system. This decline in fuel tax collection contrasts with a steady increase in the vehicle miles traveled on the national roadway system, which is expediting wear and tear. With increasing maintenance and a shrinking HTF, the traditional transportation funding system is moving in an unsustainable direction. This challenge dominates transportation debates not only in Washington, but in state capitals across the country, including Richmond.

State Transportation Funding Challenges

Virginia operates and maintains the nation's third largest highway system, which includes:

- 57,867 miles of highway
- More than 12,000 bridges
- Four underwater crossings
- Two mountain tunnels
- Three toll roads
- One toll bridge
- Four ferry services
- Forty-one safety rest areas
- Over 100 commuter parking lots

A separate system includes 10,561 miles of urban streets that are maintained by cities and towns with the help of state funds.

Funding for VDOT's activities is derived from several revenue sources – the largest being Federal. The majority of the state's transportation revenues are generated from taxes and user fees. Virginia regulations require the allocation of transportation revenues primarily from two funds, each designated for specific purposes: the Highway Maintenance and Operating Fund (HMOF) and the Transportation Trust Fund (TTF). The HMOF disburses funding for transportation maintenance projects and the TTF provides funding for transportation capital improvements (construction projects).

Virginia law requires VDOT to fully fund maintenance and operations *before* funding the construction of any new infrastructure. Historically, Virginia's transportation revenues have provided sufficient funds to meet maintenance needs while allowing residual funds to be transferred to the TTF construction

Figure 10.1: Sources of Transportation Revenues in Virginia

95% of all transportation revenues are generated primarily from motor fuel taxes and user fees at the State and Federal levels.

State Taxes and User Fees

Gas Tax (17.5 cents per gallon)

HMOF	14.85 cents
TTF	2.5 cents
DMV	0.15 cents

Every 1 cent generates $48 million in annual revenue

Vehicle Sales and Use Tax (3%)

HMOF	2%
TTF	1%

Each percent generates about $141 million in annual revenue

Motor Vehicle License Fee ($40.75)

HMOF	$26.00
TTF	$3.00
DMV	$4.00
Other	$7.75

Every 1 dollar generates $8.4 million in revenue

Sales and Use Tax (5%)

TTF	0.5%

Federal Taxes

The Federal Gas Tax is comprised of 18.4 cents per gallon and comprises 87% of the Federal Highway Trust Fund. Other sources include motor vehicle and tire taxes.

The amount of federal transportation revenues and how it is divided among the states is determined once every six years. Federal funds are not distributed as lump sum grants to states. Virginia is reimbursed for expenses.

Federally-funded projects are generally an 80% Federal and 20% State/Local match.

Other Sources

Toll revenues, bonds or debt, general fund appropriations and local contributions for specific purposes.

Source: Virginia Department of Transportation, December 2010.

fund. However, since FY 2002, the reverse has been occurring: funds from Virginia's construction fund have been diverted annually to the HMOF to cover Virginia's growing maintenance and operations needs. Starting in FY 2002, over $3 billion (averaging $357 million annually) has been transferred from construction to adequately support the maintenance of existing infrastructure. By spending less on construction, Virginia will receive less federal match funds for construction projects, and Virginia's roadways will become even more congested.

The decline in available revenue, coupled with increasing maintenance costs, have resulted in substantial decreases in the amount of funding available for construction activities as indicated in the Commonwealth's Six-Year Improvement Program (SYIP) – Virginia's program for allocating funds for transportation projects over the next six years. State officials anticipate the state will run out of money to build new roads by 2017 if maintenance continues to drain the construction fund.

Figure 10.2: Maintenance Deficit

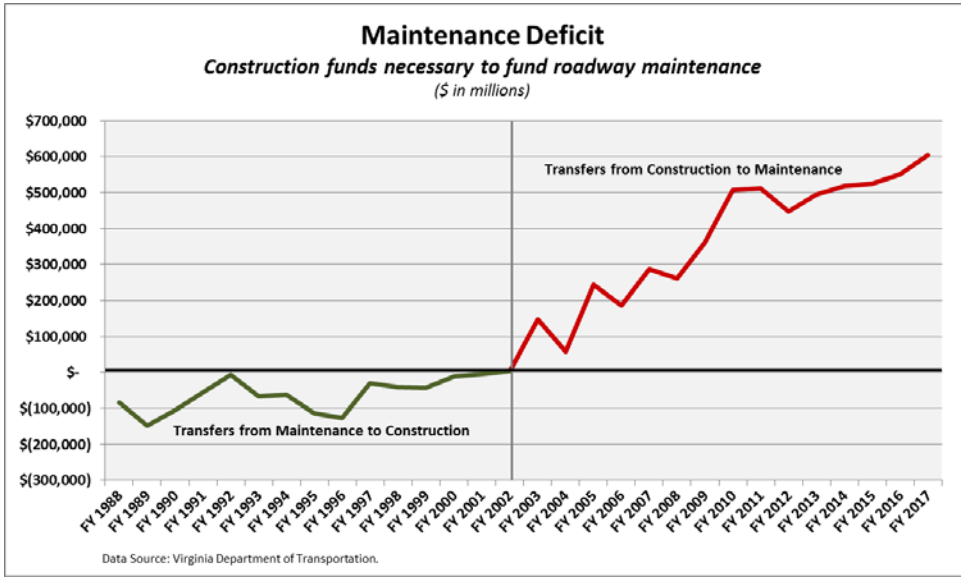


Figure 10.3: 2010 Performance Report Summary – Virginia's Highway System

Virginia's highway system is aging and requires increasing maintenance resources to maintain

2010 Performance:

- *Interstates: 22% deficient (target is 18% or less)*
- *Primary Roads: 27% deficient (target is 18% or less)*
- *Secondary Roads: 34% deficient (standard is 31% or less)*

Construction Cost Increase

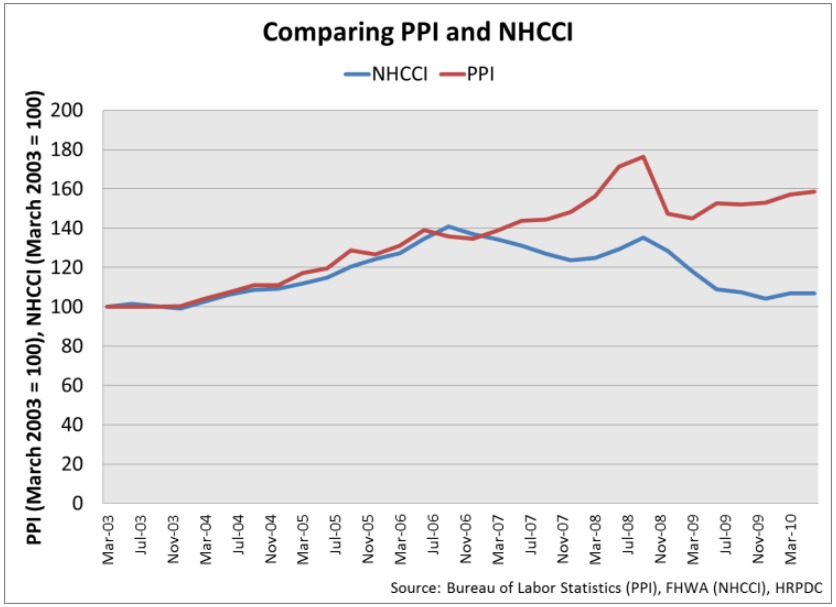
As the need to maintain, improve, and expand the capacity of the regional transportation has grown, so have many of the costs associated with those projects. Traditionally, the U.S. Census Bureau's Producer Price Index (PPI) has been used as a proxy for the costs of transportation. This index includes the cost of inputs used for road and highway construction and has increased by 57.7% between June 2000 and June 2010.[1]

The FHWA produces an index that should better track the costs associated with road projects, called the National Highway Construction Cost Index (NHCCI). This index closely tracked the PPI for Highways and Street Construction until the beginning of the 2007 recession. Since that time, the index has declined as construction companies have cut back on overhead and profit margins.

In order to overcome these financial challenges, the Nation and the State must continue to explore sustainable ways of funding transportation. At the regional level, stakeholders continue to discuss the need for establishing a dedicated regional transportation funding system, as well as investigate innovative funding sources.

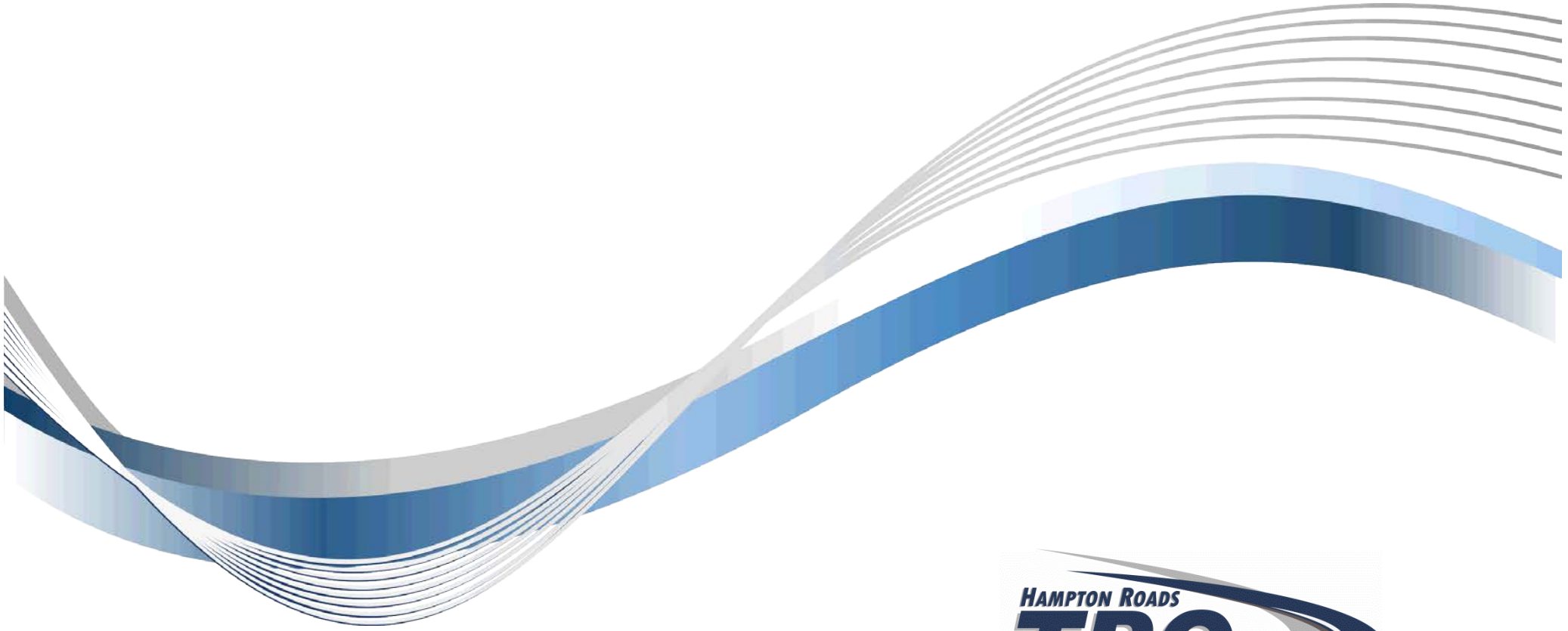
Moreover, in an effort to make the most with the funds that have been allocated to the region, prioritization of transportation needs will be essential.

Figure 10.4: Comparing Producer Price Index to National Highway Construction Cost Index



[1] The US Census stopped producing the PPI in June 2010.

Section 5 – Transportation Strategies



Mobility and Accessibility Strategies

Overcoming the mobility and accessibility challenges in the Hampton Roads region is a goal of the 2034 LRTP. The livelihood and quality of life of many residents is dependent on the constant improvement of the transportation system. Through collaboration at the various levels of government with citizen and business stakeholders, Hampton Roads can employ various strategies to improve mobility and accessibility in the region.

Mobility and Accessibility Strategies for Non-Drivers

Some residents in Hampton Roads, because of age, health, or economic circumstance are non-drivers. In an attempt to meet the challenges affecting the mobility and accessibility of non-driver populations, transportation and land use planners have collaborated to develop strategies to address some of the challenges this population faces.

At the local level, jurisdictions can encourage mixed-use activity centers through future land use planning and zoning. Concurrently, localities can invest in infrastructure and support services to further entice mixed-use development. Per the HRTPO *Non-Driver Opportunity Analysis*[1], which identifies how to maximize the travel opportunity of non-drivers to multimodal activity centers, several recommendations were made for localities to focus land use, transportation, and development efforts to improve mobility. **Map 11.1** on the following page highlights recommended areas in the region having a large number of resident non-drivers in which to focus transit investment and activity center development. Additionally, **Map 11.2** highlights activity centers with transit service in which localities could promote affordable housing development for the benefit of non-drivers.

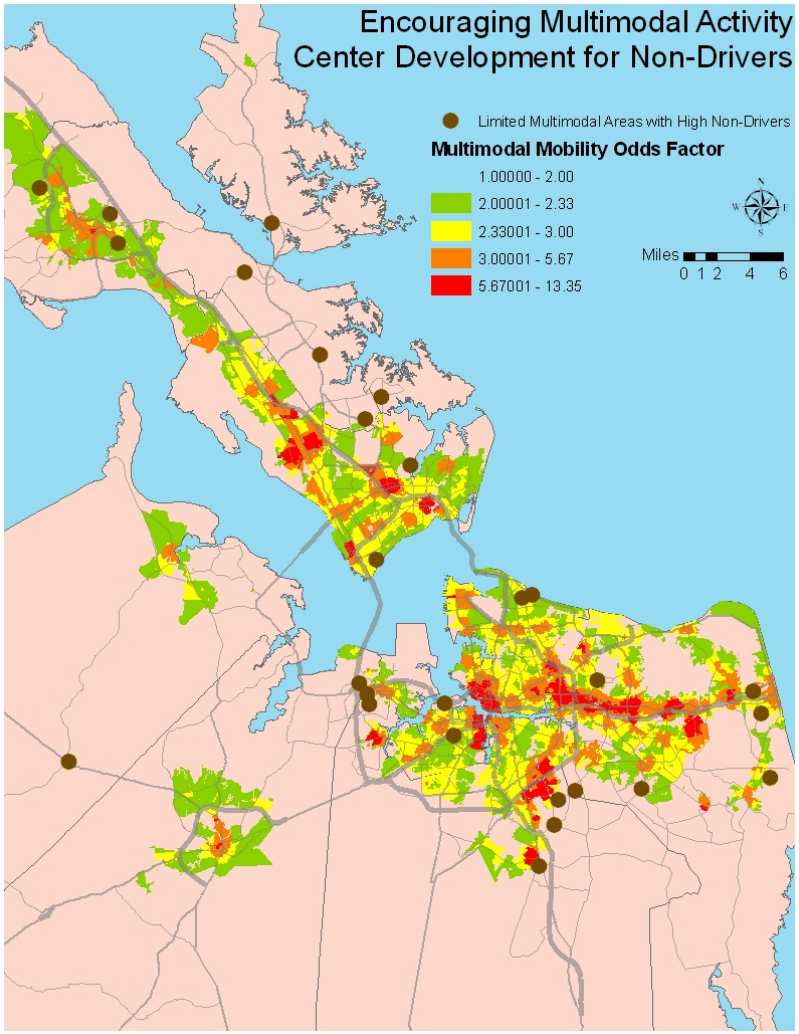
On the regional level, transit providers can encourage the clustering of enhanced, frequent, and accessible transit services within locally designated growth areas; thus promoting accessibility and mobility between mixed-use activity centers. Transit providers can also provide the audible identification of stops for visually-impaired passengers, as well as improved vehicle and transit stop accessibility in order to promote the mobility of populations with special needs.

Transit providers are also encouraged to operate an equitable and efficient service for all eligible users. Therefore, providers in the region offer paratransit service (flexible, non-fixed route transit service). Paratransit services can supplement the fixed route transit system either as a feeder or alternative service for users with mobility needs.

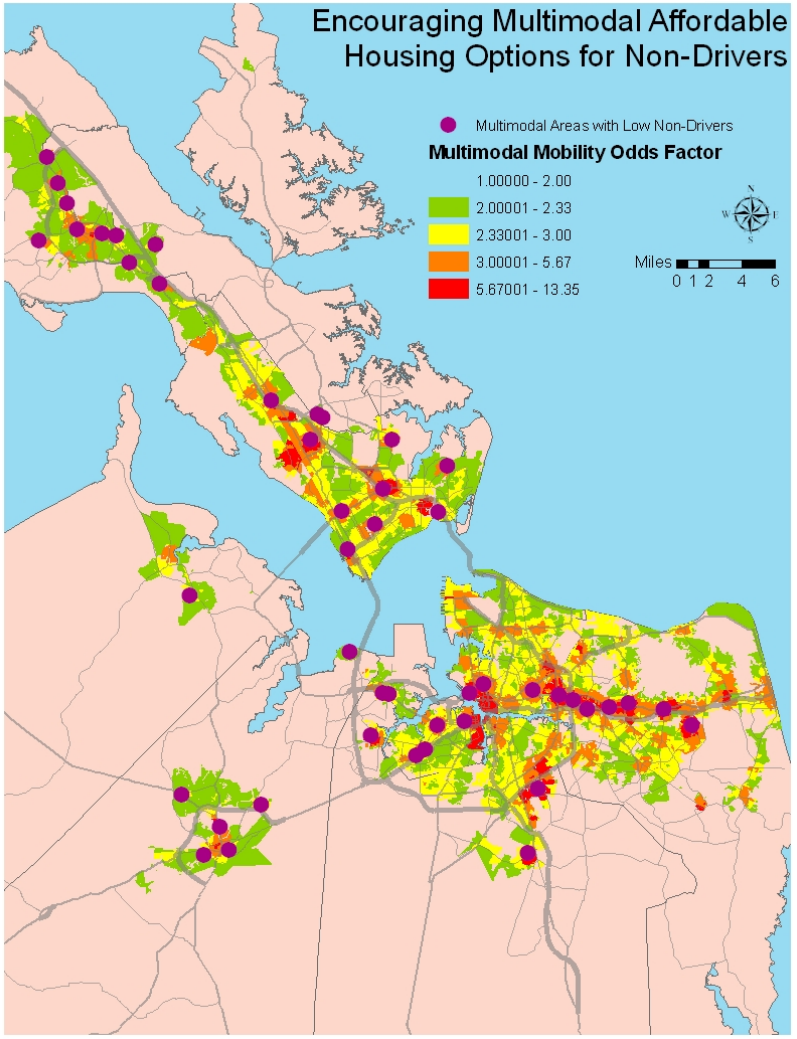
VDOT Construction of ADA Sidewalk Ramp

[1] HRTPO Non-Driver Opportunity Analysis, June 2009

Map 11.1: Encouraging Multimodal Activity



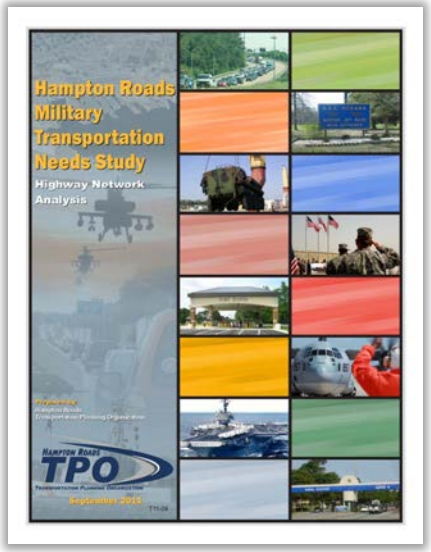
Map 11.2: Encouraging Multimodal Affordable Housing



Additionally, alternative options for users with medical/functional needs can be made available. Through ride-sharing programs, voucher programs, and private transportation providers meeting Americans with Disability Act guidelines, users, regardless of their medical/functional need, will have the opportunity to enjoy regional mobility and accessibility throughout Hampton Roads.

Furthermore, local and state agencies can continue to retrofit the transportation network with operational improvements. Prompted by the Americans with Disabilities Act of 1990, improvements have been made to the regional transportation system, including changes in signage, curb ramps, crosswalk enhancements, and transportation services, to name a few.

Finally, public partnerships can help to improve the overall mobility of non-drivers through the coordination of housing, transportation, and activity center development.



Military Transportation Needs

Late in 2009, several local military representatives informed the HRTPO Board that congestion and delays at bridges and tunnels affected mission performance, effectiveness, and efficiency. Rear Admiral Byron E. Tobin (Retired US Navy) addressed the HRTPO Board during February 2010 stating:

> "…we are dependent, in large measure, upon the resources and support of this region for the efficient and successful conduct of our mission. One of the key components of that success is mobility, [which is currently impeded] because our transportation infrastructure is in decline and struggling to meet our needs."

In response, the HRTPO staff created the *Hampton Roads Military Transportation Needs Study* to place priority on military transportation planning in the region. For the Highway Network Analysis portion of the study, the HRTPO staff worked with various stakeholders—local military representatives, state and federal agencies, port officials and local jurisdictions—to determine transportation concerns and needs of the local military.

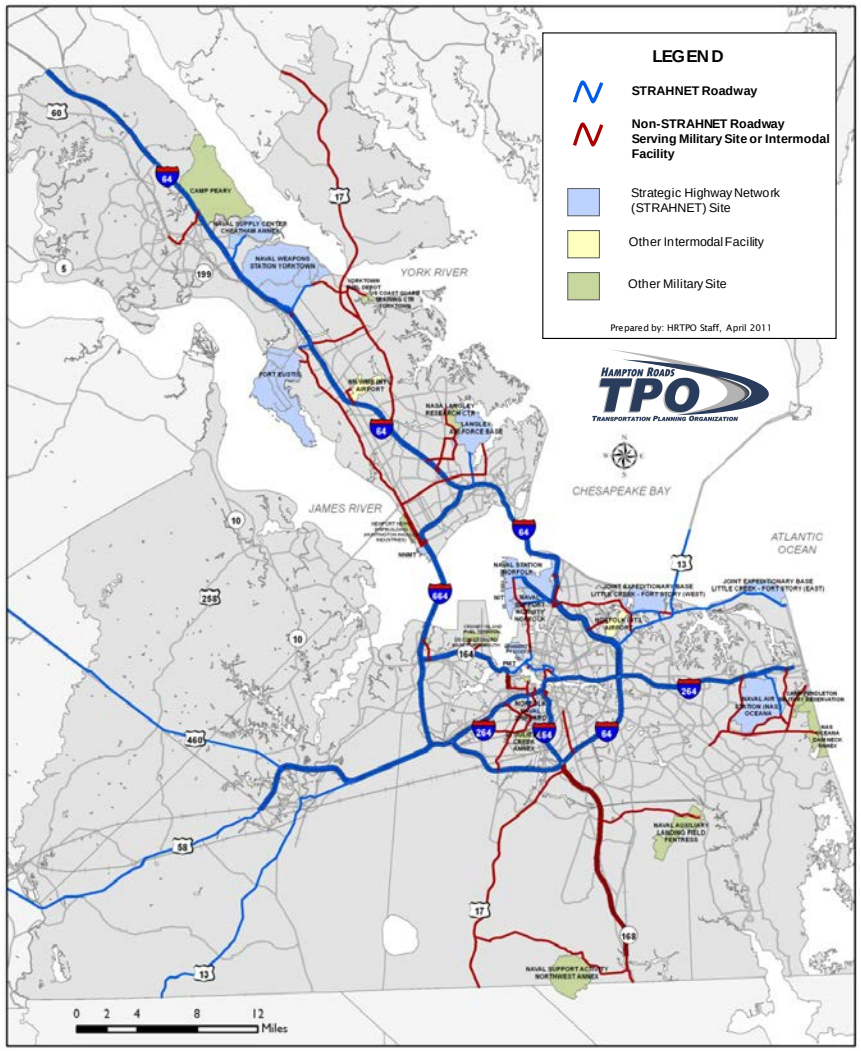
Based on stakeholder input, the HRTPO staff identified a roadway network that included both the Strategic Highway Network (STRAHNET) and additional roadways that serve the military sites and intermodal facilities not included in the STRAHNET (**Map 11.3** on the following page). Staff reviewed this "Roadways Serving the Military in Hampton Roads" network in order to determine deficient locations, such as congested segments, deficient bridges, and inadequate geometrics. The study made numerous recommendations to address existing deficiencies and to accommodate future military travel needs.

The study also identified 2034 LRTP candidate transportation projects in the region that might improve travel to and from military and supporting sites in Hampton Roads. Based on stakeholder input and the analysis of deficient locations in this study, HRTPO staff has recommended several transportation projects that may benefit military travel from the remaining list of candidate projects that do not have identified funding for construction in the 2034 LRTP[2].

Furthermore, the HRTPO staff plans to incorporate this work into future iterations of the Congestion Management Process (CMP)[3] and the regional Project Prioritization Tool[4] to assist decision makers as they select future transportation projects. The HRTPO staff plans to continue to work on military transportation needs during the current fiscal year by distributing a military personnel survey to better determine transportation challenges and problems, particularly during daily commutes.

The *Military Transportation Needs Study* has received both local and statewide interest and recognition as a result of the findings, recommendations, and potential impacts on the military. The study bridges the gap between MPOs, DOTs, local communities, and military installations that currently exists for many metropolitan areas throughout the country. Very few MPOs have taken steps to incorporate the military into the planning process; this study builds on the current relationships already established with the local military and expands the list of military and supporting sites as well as roadways serving the military that were included in the first iteration of the Project Prioritization Tool.

Map 11.3: STRAHNET and Supporting Non-STRAHNET Network



[2] Hampton Roads 2034 Long-Range Transportation Plan: List of projects for air quality conformity analysis, HRTPO, as approved on June 16, 2011.
[3] Hampton Roads Congestion Management Process: 2010 Update, HRTPO, September 2010.
[4] Hampton Roads Prioritization of Transportation Projects, HRTPO, December 2010.

The HRTPO is committed to integrating military transportation needs into its federally required metropolitan planning and programming process in the future. Captain Mary Jackson (U.S. Navy) commended the HRTPO initiative and called it a "*great first step*". Captain Jackson said the Navy is "*committed to continuing to collaborate*" in regional planning efforts.

Freight Strategies

Based on growth in trade and improvements to the Panama Canal, the Virginia Port Authority projects that the amount of freight handled by the Port of Virginia will increase to seven million TEUs (twenty-foot equivalent unit, a unit of cargo capacity) annually by the year 2030. To meet this demand, the Virginia Port Authority will need to continue adding capacity to its facilities. In recent years, capacity has been added through infrastructure improvements at the existing Port of Virginia facilities as well as the leasing of APM Terminals.

In addition, future capacity will be added to the Port of Virginia by expanding the APM Terminals facility and constructing a fifth marine terminal. This proposed fifth terminal, currently known as the Craney Island Marine Terminal, will be constructed on new land to the east of the Army Corps of Engineers Craney Island Dredged Material Management Area. The facility will be served by a new roadway, the Craney Island Connector (CIC). The CIC will provide access to the Western Freeway near APM Terminals. Rail access will be provided to the Craney Island Marine Terminal by an extension of the current Commonwealth Railway line that serves the APM Terminals.

Regional Freight Planning

The goal of good multimodal transportation is to create a transportation network for the movement of people and goods that is safe, strategic, efficient, and seamless. An important and often overlooked component of the transportation system is

Port of Virginia

intermodal connectivity. Ideally, transportation networks should function as interconnected webs. All transportation modes impact one another and a single inadequate link in the transportation system can reduce the efficiency and productivity of the overall system. For this reason, it is important to identify current or emerging problems for all modes of travel in Hampton Roads and develop strategies to improve connectivity.

Since 1991, Congress has encouraged the consideration of freight movement and intermodal connectivity during statewide and metropolitan transportation planning processes. Resulting from this growing awareness and new emphasis, the HRTPO developed an Intermodal Management System (IMS) for the region in the early 1990s, and released the region's first IMS report in 1996 with subsequent updates in 2001 and 2007.

Regional freight planning for Hampton Roads is an on-going process that identifies, develops, evaluates, and implements transportation strategies to improve the movement of goods and enhance the connectivity among all modes of transportation. Regional freight planning supports the federal planning factor to enhance connectivity, across and between modes, for people and

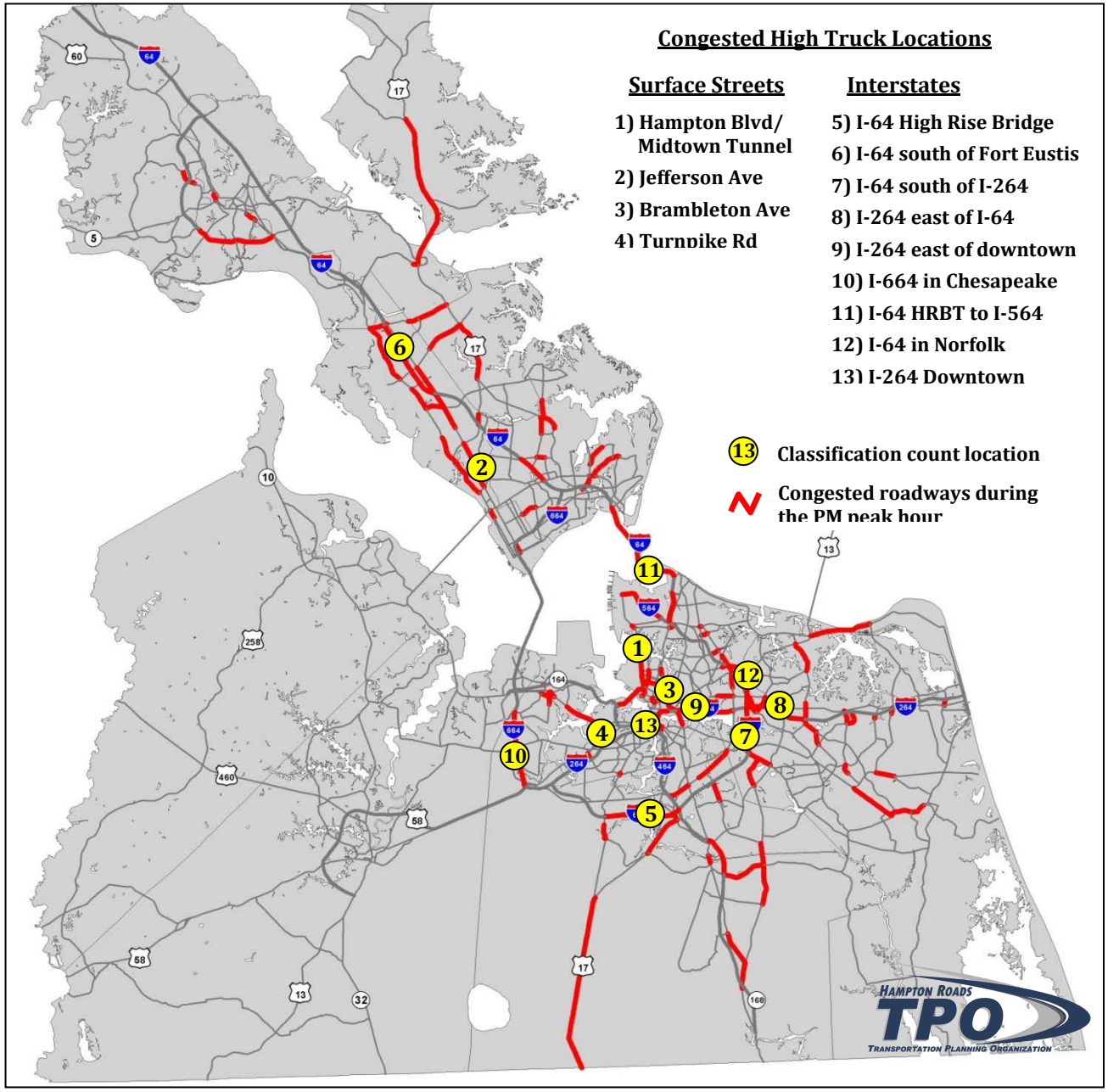
freight. In addition, the HRTPO uses the results from freight studies as well as the Congestion Management Process to feed into the development of the LRTP.

2007 IMS Regional Freight Study Summary

A description of the major sections from the IMS Regional Freight Study (April 2007) is provided below:

1. *Integration of Freight Into the Transportation Planning Process* – describes the process for the Hampton Roads region and provides guidance to other metropolitan regions throughout Virginia and the US of the steps involved in freight planning. It also describes the various freight data sources and analytical tools that are available.
2. *Coordination with Statewide Freight Study* – describes the statewide coordination with freight officials and stakeholders in Virginia and provides the results of a freight survey conducted by the Virginia Department of Transportation. The HRTPO staff worked with VDOT and other stakeholders in the development of the Virginia Statewide Multimodal Freight Study Phases I (completed in 2007) and II (completed in 2010), which are available on the VTrans website at www.vtrans.org.
3. *Freight Facilities in Hampton Roads* – provides a detailed description of the roadways, railroads, intermodal and port facilities, warehouse and distribution centers, drawbridges, and railroad crossings on the Southside and Peninsula in Hampton Roads.
4. *Freight Facts, Trends, and Forecasts* – provides a better understanding of the freight moving in and out of Hampton Roads and how it compares with other areas in the United States and around the world.
5. *Military Freight* – describes why it is important to maintain a safe, secure, and efficient transportation system in Hampton Roads should an unexpected event occur that would require a rapid deployment of military cargo and personnel via air, land, or sea. This section also provides truck shipment data for military installations in Hampton Roads.
6. *Commodity Flow Data Analysis* – analyzes domestic freight movement into, out, and within Hampton Roads for all transportation modes for 2004 and 2035 using the Transearch Freight Database by Global Insight.
7. *Regional Truck Movement* – analyzes the movement of trucks both within Hampton Roads as well as through the gateways of the region. This section also identifies freight bottlenecks in Hampton Roads (See **Map 11.4**).
8. *Future Freight Needs* – identifies future freight needs and strategies to enhance freight movement to, from, and within Hampton Roads.

Map 11.4: Freight Bottlenecks During the Afternoon Peak Period, 2005



Note: Truck volumes at Congested Locations #10-13 are estimated.
Data sources: VDOT, HRPDC.

FTAC Activities

In 2009, the HRTPO Board created the Freight Transportation Advisory Committee (FTAC) to advise the Board on freight issues. According to HRTPO bylaws, "*The FTAC will conduct public outreach activities that help TPO efforts to explain and help raise awareness of the importance of freight transportation to the region and to collect region-wide public input on these matters.*"

The FTAC consists of nine members, eight from private industry plus one HRTPO board member who serves as one of two FTAC Co-Chairs. The HRTPO Chair appoints one of the eight private sector FTAC members as the other FTAC Co-Chair, who thereby also serves as a non-voting member of the HRTPO Board. The Virginia Port Authority (VPA) staff handles the administration of FTAC (agendas, minutes, etc.), with HRTPO staff providing technical assistance and research as necessary.

Since its first meeting in December of 2009, FTAC has been actively advising the HRTPO Board on:

- Project Prioritization Methodology
- Project Prioritization analysis, stating that "*Goods movement across the region requires that transportation infrastructure be viewed as "systems" to be improved*."
- Traffic impact of a hypothetical inland port in Hampton Roads.
- Developing a video voicing the importance of freight transportation "to the freight, business, transportation community, and the public."
- Project Prioritization criteria's relative weighting of data used to determine project readiness and the economic benefit of projects.
- Impacts of tolling proposals on the freight transportation community.
- Pursuing analysis to determine the level of truck tolls at which a toll project becomes counterproductive (i.e. the toll expense outweighs the transportation benefit) in attracting/retaining freight-related businesses in Hampton Roads.

Congestion Strategies

Congestion Management Process

The first critical step in solving congestion problems in Hampton Roads is to identify and develop potential congestion mitigation strategies. As a part of the CMP, a "toolbox" of specific congestion mitigation measures has been assembled to promote strategic solutions involving all modes of transportation, better land development, and more efficient use of the existing transportation system as required by federal CMP regulations.

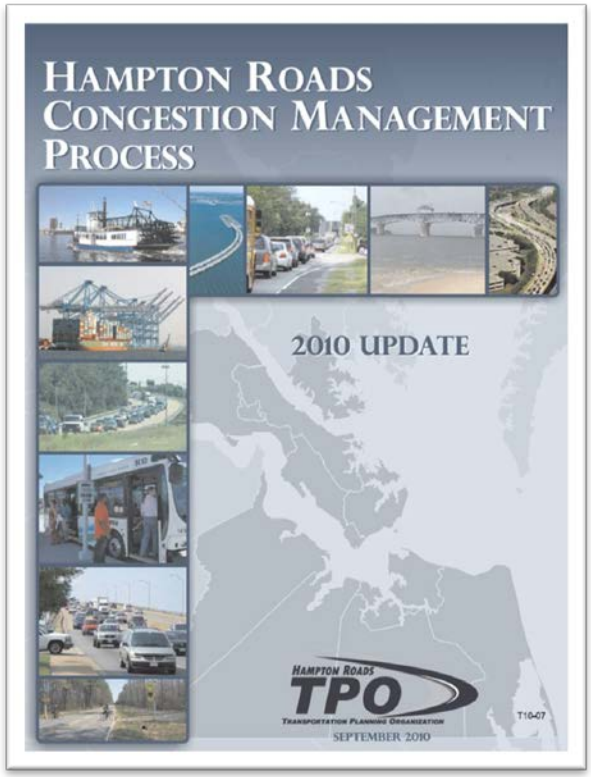
Figure 11.1 HRTPO CMP Strategies

HRTPO CONGESTION MITIGATION STRATEGIES

1) Eliminate Person Trips or Reduce VMT
2) Shift Trips from Automobile to Other Modes
3) Shift Trips from SOV to HOV
4) Improve Roadway Operations
5) Add Capacity

During the strategy evaluation process, it is important to consider using the strategies in the order presented in a "top-down" approach that would examine strategies to eliminate or shift automobile trips or improve roadway operations prior to adding capacity. Given today's economic conditions and budgetary constraints, it is imperative to first investigate strategies that utilize the existing capacity on our transportation network. It is also important for regional decision makers, planners, engineers, and other agencies involved with transportation to communicate and coordinate their efforts on a regular basis to solve existing problems and mitigate future congestion in Hampton Roads.

Table 11.1 on the following page provides a detailed description of all five strategies contained in the Congestion Mitigation Strategy "Toolbox"[5]. It also provides examples and ways to apply these techniques and strategies to reduce overall congestion. Most of the congestion mitigation strategies are intended to be applied to individual corridors; however, there are several strategies that may be applied to the entire region[6].



[5] Primary Source: Wilmington Area Planning Council (WILMAPCO), 2009 Congestion Management System.

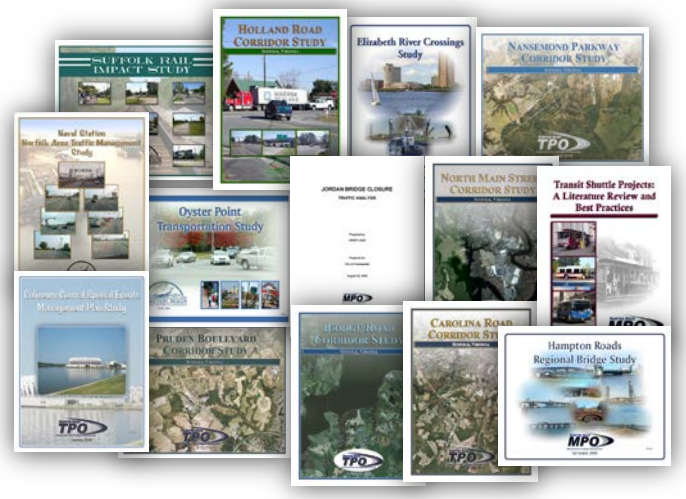
[6] HRTPO *Hampton Roads Congestion Management Process*, 2010 Update

Table 11.1: Congestion Mitigation Strategy "Toolbox"

Strategy #1 Eliminate Person Trips or Reduce VMT	**Growth Management/Activity Centers**
	1-1 Land Use Policies/Regulations Encourage more efficient patterns of commercial or residential development in defined areas. Specific land use policies and/or regulations that could significantly decrease both the total number of trips and overall trip lengths, as well as making transit use, bicycling and walking more viable include, but are not limited to the following: · Encouraging development in existing centers and/or communities (i.e. infill development) · Discouraging development outside of designated growth areas · Promoting higher density and mixed uses in proximity to existing or planned transit service · Establishing a policy for new and existing subdivisions to include sidewalks, bike paths, and transit facilities where appropriate
	Congestion/Value Pricing
	1-2 Road User Fees/HOT Lanes Includes area-wide pricing fees, time-of-day/congestion pricing and tolls. Most appropriately applied to freeways and expressways. Requires infrastructure to collect user fees. High Occupancy Toll (HOT) lanes – combines HOV and pricing strategies by allowing single occupancy vehicles to gain access to HOV lanes by paying a toll.
	1-3 Parking Fees Market-based strategy designed to modify mode choice by imposing higher costs for parking private automobiles. Most appropriately applied to parking facilities in urban environments.
	Transportation Demand Management
	1-4 Telecommuting Encouraging employers to consider telecommuting options full- or part-time to reduce travel demand.
	1-5 Employee Flextime Benefits/Compressed Work Week Encouraging employers to consider allowing employees to maintain a flexible schedule - thus allowing the employee the option to commute during non-peak hours.
Strategy #2 Shift Trips from Auto to Other Modes	**Public Transit Capital Improvements**
	2-1 Exclusive Right-of-Way - New Rail Service Includes heavy rail, commuter rail, and light rail services. Most appropriately applied in a dense context serving a major employment center.
	2-2 Exclusive Right-of-Way - New Bus Facilities Includes Busway, Bus Only Lanes, Bus Pull-Out Bays, and Bus Bypass Ramps. Most appropriately applied to freeways and expressways with high existing transit ridership rates.
	2-3 Ferry Services Implement ferry services and supporting facilities.
	2-4 Fleet Expansion Expansion of existing rail, bus, and/or ferry capacity to provide increased service.
	2-5 Improved Intermodal Connections Improve the efficiency and functionality of intermodal connectors (i.e. expanded parking/improved access to stations) where several modes of transportation are physically and operationally integrated.
	2-6 Improved/Increased Park & Ride Facilites & Capital Improvements Improve existing facilities and identify new locations.
	Public Transit Operational Improvements
	2-7 Service Expansion Includes increased service frequency/area, special events, and accomodations for persons with disabilities.
	2-8 Traffic Signal Preemption Improve traffic flow for transit vehicles traveling through signalized intersections.
	2-9 Improved Transit Performance Includes electronic fare payment, ticket vending machines, eliminating/consolidating stops, express transit routes, and improved transfers.
	2-10 Transit Fare Reductions Plan/Reduced Rate of Fare Includes system-wide reductions, off-peak discounts and deep discount programs.
	2-11 Transit Information Systems Improved in-vehicle and station information systems to improve the dissemination of transit-related information to the user.
	Bicycle and Pedestrian Modes
	2-12 Improved/Expanded Bicycle Network Includes on-road facilities, pathways, and greenways.
	2-13 Bicycle Storage Systems Providing safe and secure places for bicyclists to store their bicycles.
	2-14 Improved/Expanded Pedestrian Network Includes sidewalks, pedestrian signals and signs, crosswalks, overpasses/tunnels, pedestrian only zones, countdown signals, street lighting, greenways, and walkways.

Table 11.1: Congestion Mitigation Strategy "Toolbox" (Continued)

Strategy #3 Shift Trips from SOV to HOV	**High Occupancy Vehicles (HOV)**	
	3-1 Add HOV Lanes	Most appropriate for freeways and expressways.
	3-2 HOV Toll Savings	Preferential pricing to multi-occupant vehicles. Requires infrastructure to administer toll collection.
	Transportation Demand Management	
	3-3 Rideshare Matching Services	Providing carpool/vanpool matching, ridesharing information resources and services, car sharing, and guaranteed ride programs.
	3-4 Vanpool/Employer Shuttle Program	Organizing groups of commuters to travel together in a passenger van or employer-provided shuttle on a regular basis.
	3-5 Trip Reduction Program	Organizing groups (i.e. employers) that offer tax incentives, commuter rewards, or transit subsidies on a regular basis.
	3-6 Parking Management	Preferential parking is a low-cost incentive that can be used to encourage the utilization of alternative commute modes, such as carpooling and vanpooling.
Strategy #4 Improve Roadway Operations	**Traffic Operational Improvements**	
	4-1 Geometric Improvements	Improvements to roadway and intersection geometrics to improve overall efficiency and operation.
	4-2 Intersection Turn Restrictions	Providing intersections turn restrictions to reduce conficts and increase overall intersection performance.
	4-3 Intersection Signalization Improvements	Improving signal operations through re-timing signal phases, adding signal actuation, event/holiday timing plans, emergency vehicle preemption etc.
	4-4 Coordinated Intersections Signals	Improving traffic signal progression along identified corridors.
	4-5 Roadway Environment	Includes improvements in pavement markings, pavement condition, pavement reflectors, signage, rumble strips, guardrails, line-of-sight clearances, roadway lighting, etc. that improve roadway operations and congestion.
	4-6 Intelligent Transportation Systems/Smart Traffic Centers (ITS)	Utilizing the latest technology to assist in congestion mitigation, information dissemination, and traffic planning efforts. Examples include road sensors, video detection, changeable message signs, SMART Tag (electronic toll), red light enforcement equipment, truck height/weight enforcement technologies, fiber optic network, ITS data archives, 511 Traveler service, and Smart Travel Laboratories.
	4-7 Reversible Lanes	Reversible Lane Systems enable the maximum use of roadways with heavy directional distribution of traffic by changing the direction of the individual travel lanes. Lane control signs, displayed well in advance of a merge, are often used to close lanes with lower traffic volume and open additional lanes for higher volume.
	4-8 Freight Policies and Improvements	Includes delivery hour restrictions, truck lane restrictions, truck route signage and enforcement, truck route diversion, truck only lanes, bridge lift restrictions, rail improvements, intermodal yards, etc.
	4-9 Incident Management, Detection, Response & Clearance	Utilize traveler radio, travel alert notification (via e-mail, fax, etc.), and general public outreach to enhance incident-related information dissemination.
	4-10 Construction Management	Minimizing congestion caused by roadway maintenance and construction, and alert travelers to construction activities.
	4-11 Elimination of Bottlenecks	Eliminating high-traffic areas where one or more travel lane(s) is dropped.
	4-12 Ramp Metering	Metering vehicular access to a freeway during peak periods to optimize the operational capacity of the freeway.
	4-13 Access Control and Connectivity	Reduction or elimination of "side friction", especially from driveways via traffic engineering, regulatory techniques, and purchase of property rights. Also includes connections between properties, developments, and roadways.
	4-14 Median Control	Addition of medians with turn bays via traffic engineering and regulatory techniques.
Strategy #5 Add Capacity	**Addition of General Purpose Lanes**	
	5-1 Freeway Lanes	Increasing the capacity of congested freeways through additional travel lanes.
	5-2 Arterial lanes	Increasing the capacity of congested arterials through additional travel lanes.
	5-3 Interchanges	Improving Interchange design to allow smoother traffic flow to/from arterials.
	5-4 Improve Alternate Routes	Constructing new roadways or increasing the capacity of other roadways that will decrease demand on congested existing facilities.



Corridor and Other Planning Studies

The HRTPO staff conducts studies and prepares reports for various transportation issues in order to improve safety and mobility, and relieve congestion in the region. Several corridor and local planning studies are completed each year as part of the HRTPO Unified Planning Work Program (UPWP). These studies are typically requested by local municipal governments, the HRTPO Board, or the general public and are often considered critical transportation topics.

Most studies contain data, analysis, and a set of recommendations that support the goals and objectives established within the CMP and the LRTP. Many of these studies support one or more of the eight federal planning factors. All studies are coordinated with VDOT, local municipalities, and other stakeholders, and are made available for public review and input.

Figure 11.2: HRTPO Studies Completed Since 2007

2007

- Suffolk Rail Impact Study – May 2007
- Naval Station Norfolk Area Traffic Management Study – April 2007

2008

- Oyster Point Transportation Study – April 2008
- Holland Road Corridor Study – June 2008
- Elizabeth River Crossings Study – June 2008
- Transit Shuttle Projects: A Literature Review and Best Practices – June 2008
- South Norfolk Jordan Bridge Closure Traffic Analysis – September 2008
- Hampton Roads Regional Bridge Study – September 2008
- North Main Street Corridor Study – December 2008
- Hampton Roads Regional Travel Delay Study – December 2008

2009

- Bridge Road Corridor Study – October 2009

2010

- Coliseum Central Special Events Management Plan Study – January 2010
- Nansemond Parkway Corridor Study – April 2010
- Pruden Boulevard Corridor Study – June 2010
- Regional Land Use Research Scan – June 2010
- Carolina Road Corridor Study – July 2010

2011

- US Route 460 Corridor Study – July 2011
- Traffic Impact of a Hypothetical Inland Port in Hampton Roads Study – September 2011

Public Transportation Strategies

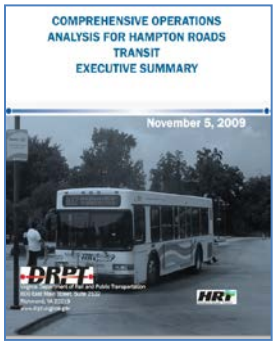
In order to meet the growing mobility and accessibility needs of the Hampton Roads population and offset congestion, public transportation investments and solutions have to be considered within the regional multimodal transportation network.

Hampton Roads Transit (HRT), Williamsburg Area Transit Authority (WATA), the HRTPO, and the Virginia Department of Rail and Public Transportation (DRPT) have been actively planning for envisioning and implementing enhanced public transportation services in the Hampton Roads region.

HRT Strategic Planning Efforts

HRT recently developed a Transit Development Plan (TDP), completed in December 2011. The HRT TDP has a six-year horizon spanning 2012 to 2017, focusing on guiding the operational management and capital improvements of the transit system. As part of the TDP, HRT drafted a Comprehensive Operational Analysis and conducted a Service and Schedule Efficiency Review.

HRT Comprehensive Operational Analysis



The Hampton Roads Transit *Comprehensive Operational Analysis* (COA), approved in 2009, identifies improvements in the operational and business practices of the transit agency. The COA provides recommendations for the short-term, mid-term, and long-term. The recommendations include amenities, transfer centers, fleet, agency organization, current service, new service, and service expansion. The COA recommendations will enable HRT to use its existing resources as efficiently as possible in order to provide a high quality bus service.

HRT Service and Schedule Efficiency Review

The HRT *Service and Schedule Efficiency Review* was published to identify significant operational savings through scheduling and service efficiencies. The study was triggered as the agency tries to avoid or reduce the magnitude of a possible fare increase. The HRT Service and Schedule Efficiency Study has reviewed four key aspects of HRT transit service operations in order to identify opportunities for achieving significant operating cost savings:

- Service Performance
- Schedule Efficiency
- Operator Work Practices
- Labor Utilization

WATA Strategic Planning Efforts

WATA has also developed a TDP to assist in the guidance of the operational management and capital improvements in their transit system. Approved in 2009, the WATA TDP has a six-year horizon spanning from 2010 to 2015. The WATA TDP is comprised of:

- System goals, objectives, and performance metrics
- Overview of service strengths and weaknesses
- Transit investment vision plan
- Fiscally constrained and programmed operational and capital investments
- Financial plan

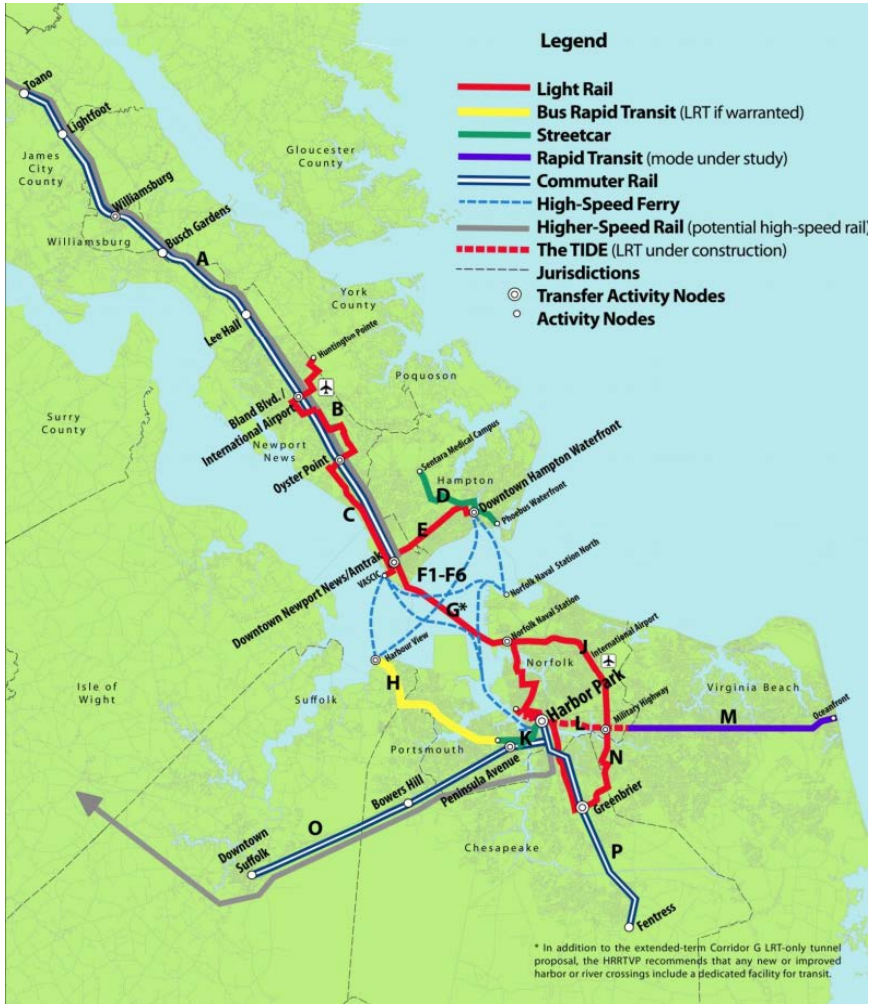
WATA will also develop a COA in 2012 to evaluate the current use and performance of its transit system.

Hampton Roads Regional Transit Vision Plan

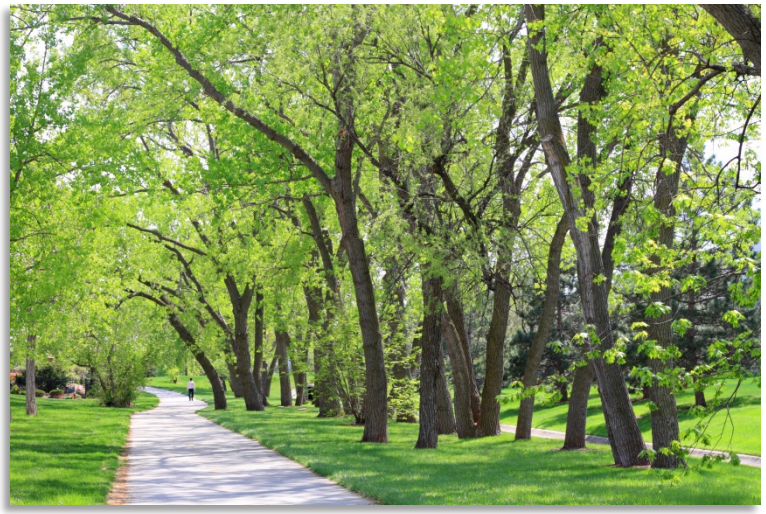
In the past several years, public transportation stakeholders in Hampton Roads have been collaborating to define a vision for the region's public transit system. The local governments understand that transit can help achieve the goals of relief from traffic congestion, improved quality of life, preservation of natural resources, and economic development. However, these gains require collaborative planning and integration of land use and transportation plans. *The Hampton Roads Regional Transit Vision Plan* is a realization of a multi-year collaborative effort to improve transit in the region.

The Hampton Roads Regional Transit Vision Plan (TVP) was designed to aid in the visualization of what may be possible for the region's transit services in the future – 2025 and beyond. The TVP provides a concept for a regional rapid transit network that connects major employment and population centers in Hampton Roads, including coordinated land use planning, combined with specific transit modes that improve mobility options for the public. The purpose of the TVP is to provide a long-term framework for transit development, rather than a definite set of approved projects. As the region selects projects for further study, planners, elected officials, and the public will collaborate to define the specific requirements, alignments, and transit modes in accordance with local land use planning, alternative analysis, environmental considerations, and available funding.

Map 11.5: Hampton Roads Regional Transit Vision Plan



Note: The Norfolk TIDE opened in August 2011



Bicycle and Pedestrian Strategies

Either to connect to other modes of transportation or destinations, the non-motorized transportation network, namely sidewalks, bikeways, and trails, is crucial for mobility and accessibility. There are several ongoing efforts in the Hampton Roads region to advocate and assist in the planning of local and regional sidewalks, bikeways, and trails.

Current statewide guidelines have started to encourage roadway enhancements and capacity improvements to include a non-motorized component. All VDOT projects begin with the assumption that a bicycle-pedestrian accommodation will be provided unless the project falls within one of six categorical exclusions:

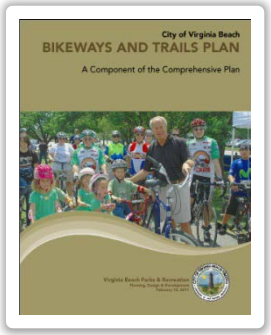
1. Scarcity of population, travel and attractors, both existing and future, indicate an absence of need for such accommodations
2. Environmental or social impacts outweigh the need for such accommodations
3. Safety would be compromised
4. Total cost of bicycle and pedestrian accommodations to the appropriate fund (i.e. Interstate, Primary, Secondary, or Urban system) would be excessively disproportionate to the need for the facility
5. Purpose and scope of the specific project do not facilitate the provision of such accommodations (e.g. projects for the Rural Rustic Road Program are defined as paving unpaved (gravel) roads, which are considered to be a bicycle accommodation)
6. Bicycle and pedestrian travel is prohibited by state or federal law

To further promote bicycle and pedestrian facilities across the state, the *Virginia State Bicycle Policy Plan* was adopted in September of 2011.

Similar guidelines are emerging in the region's localities, promoting the incorporation of non-motorized facilities within roadway improvements and new developments. Localities have begun to organize bicycle and trail advisory committees to advocate and advice policy-makers on non-motorized network development.

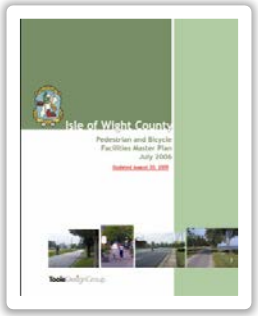
Planning for bicycle facilities and sidewalks is largely managed on the local level. Most Hampton Roads localities include bicycle and pedestrian planning within their Comprehensive Plans. Many localities also have bicycle and pedestrian advisory committees which are chartered to advise their city councils or county boards of supervisors on various aspects of bicycle and pedestrian planning. In addition, many localities in Hampton Roads have developed detailed bikeway and trail plans, along with maps of existing and planned routes. Examples include:

- **Virginia Beach** - The city of Virginia Beach produced an update to the *Virginia Beach Bikeways and Trails Plan* in 2011. Bikeway and trail information is also accessible on the city's website, including maps of the city's bicycle routes and facilities.



- **Historic Triangle** - James City County, York County, and Williamsburg have joined together for many bikeway planning efforts, including the preparation of a *Regional Bicycle Facilities Plan* and a *Regional Bikeway Map*. These documents are available on York County's website.

- **Isle of Wight -** Isle of Wight County has a *Pedestrian and Bicycle Facilities Master Plan*. The plan, which was updated in 2009, is available on the county's Department of Planning and Zoning website.



- **Newport News** - The city of Newport News graphically displays all of its bicycle paths on the city's GIS mapping website.

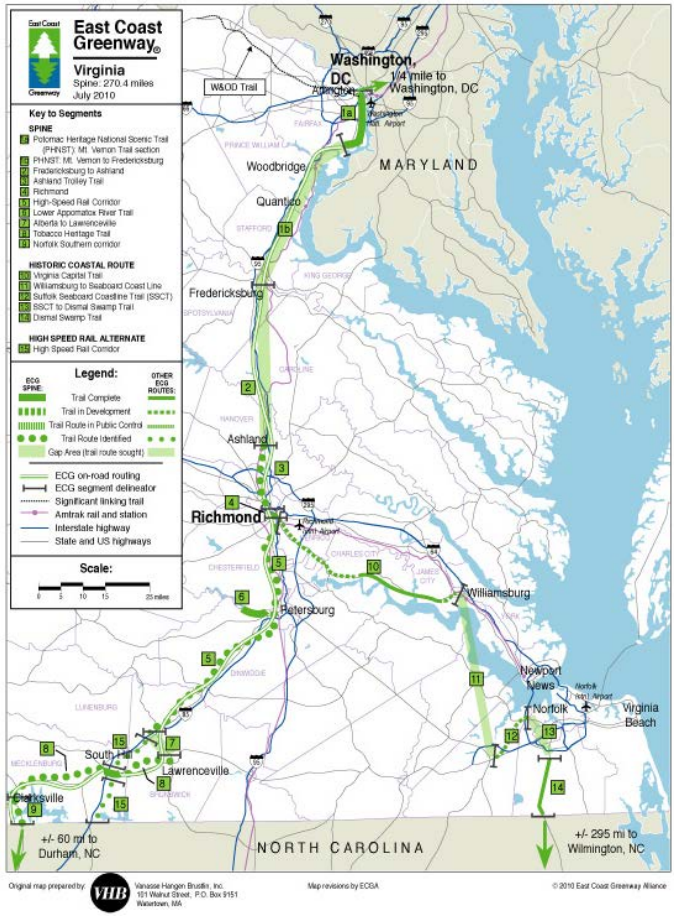
There are several national, state, and regional bicycle and pedestrian trails in Hampton Roads[7], including:

National
- East Coast Greenway

State
- Beaches to Bluegrass Trail
- James River Heritage Trail

Regional
- Virginia Capital Trail
- South Hampton Roads Trail
- Dismal Swamp Connector Trail

Map 11.6: East Coast Greenway



[7] Hampton Roads Regional Trails Update, Joint Environmental Committee, December 2010

The East Coast Greenway is a 3,000 mile trail network, of which 81 miles run through the Hampton Roads region. The Hampton Roads alignment, which is from Jamestown to Elizabeth City, NC, aims to provide an off-road trail wherever possible. The East Coast Greenway serves as an urban counterpart to the Appalachian Trail network (See **Map 11.6**).

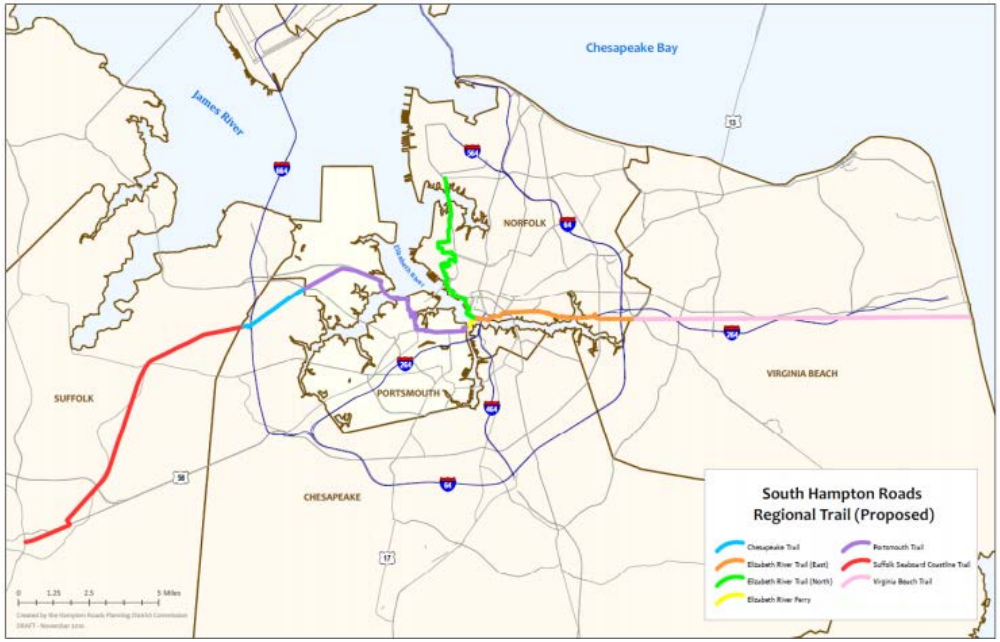
The South Hampton Roads Trail is another trail that is a proposed 41 mile federation of projects that aims to connect four of five urban centers from Suffolk to Virginia Beach. The project aims to have a mix of facility types along the alignment, including dedicated trails, bike lanes, enhanced road shoulders, and ferry service (**Map 11.7**).

There is also a bi-state planning effort to develop the Dismal Swamp Connector Trail. This 15 mile multi-use trail parallels the eastern portion of the Dismal Swamp from Deep Creek in Chesapeake to South Mills, North Carolina. Planning and design for the final 3-mile segment at the VA/NC line is underway.

In response to this growing need for regional coordination on bikeway and pedestrian infrastructure development, HRTPO staff has embarked upon a research scan of bike and pedestrian plans. This broad scan includes a review of bike and pedestrian plans from regions across the United States and worldwide. The scan is designed to identify best practices in:

- Facility and network development
- Facility and network management
- Methodology for regional bicycle and pedestrian plan development
- Implementation strategies to educate, fund, and develop the regional non-motorized network.

Map 11.7: South Hampton Roads Regional Trail



Rail Strategies

Integral to the vitality of the region is the role rail has in moving people and goods. Rail transportation has the potential to reduce highway congestion and pollution through improvements in the freight and passenger rail systems. For the increased mobility of people and goods and operational efficiency of the regional rail system, private and public stakeholders must continue planning for and investing in rail infrastructure.

Freight Rail

Regionally, there are various projects and initiatives, either completed or underway, investigating ways to improve mobility, operational efficiency, and safety of the regional rail system. Additionally, private rail companies (Norfolk Southern and CSX) have invested in capital and supporting infrastructure projects to improve the operations of the regional rail traffic, including signal and crossing upgrades, third track installation, and intermodal rail stations.

As the private sector improves the rail infrastructure, the public sector can be involved in improvements between rail and other modes of transportation. There are various operational improvements that can be made to reduce conflicting intermodal movements in the rail system, including:

- Closing redundant rail crossings with low multimodal traffic[8]
- Providing messaging for motorists near major at-grade crossings, alerting drivers of impending road closures due to crossing trains (drivers can seek alternate routes, reducing roadway congestion, and safety conflicts at the rail crossing)[9]

To improve safety, major at-grade crossings can be replaced with grade separated crossings. In order to enhance capacity, heavy rail corridors could be double-tracked for two-way traffic, or include a third track to allow faster rail cars (such as passenger trains) to bypass slower rail cars (such as freight trains).

Heartland Corridor

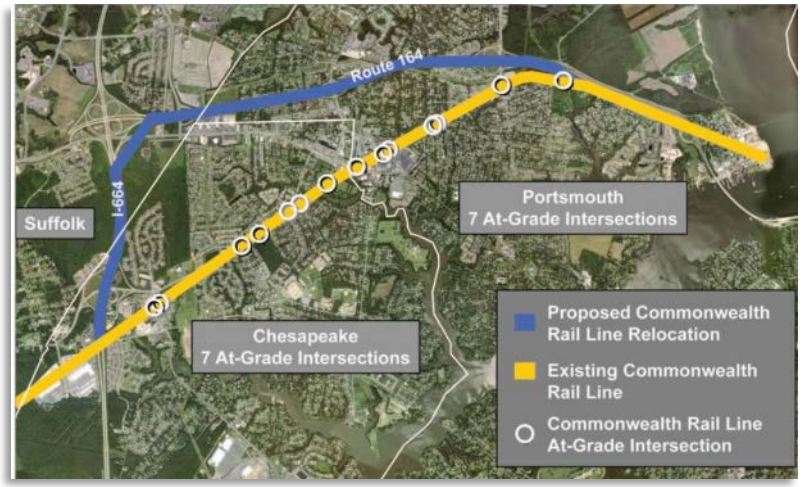
As the Port of Virginia continues to grow in container volume, freight rail plays an important role in transporting goods from the Port to various markets of the United States. To improve the movement of freight and increase rail capacity with strategic infrastructure investments, Norfolk Southern and several states have partnered for the construction of the Heartland Corridor project. Completed in September 2010, the project involves raising tunnel clearances, allowing the use of efficient double-stack containers along a corridor between Hampton Roads and Columbus, Ohio. Additional in Virginia, the project includes constructing a new intermodal facility in the Roanoke region.

[8] Crossing Consolidation Guidelines, FRA, (2009)
[9] Zhang & Schurr (2005)

National Gateway

Similar to the Heartland Corridor project by Norfolk Southern, CSX has also engaged in a corridor improvement project along the East Coast. Dubbed the National Gateway project, this project aims to improve the movement of double-stack freight to and from the Port of Virginia. The project will remove vertical obstructions on the CSX National Gateway system which extends from Atlanta, Georgia to the Northeast along the I-95 corridor. CSX has partnered with various states and the federal government to fund the initiative.

Figure 11.3: Commonwealth Rail Mainline Relocation



Commonwealth Rail Mainline Relocation

A recently completed rail project in the region includes the relocation of the Commonwealth Railway mainline that accesses the APM Terminals. Relocated to I-664 and the Western Freeway, the new rail line allows grade separated rail access to the marine terminal (bypassing the old 4.5 mile rail line with 14 at-grade rail crossings). This corridor will be used to serve both the planned VPA Craney Island Marine Terminal and the recently completed Maersk APM Terminal.


Williamsburg Amtrak Station

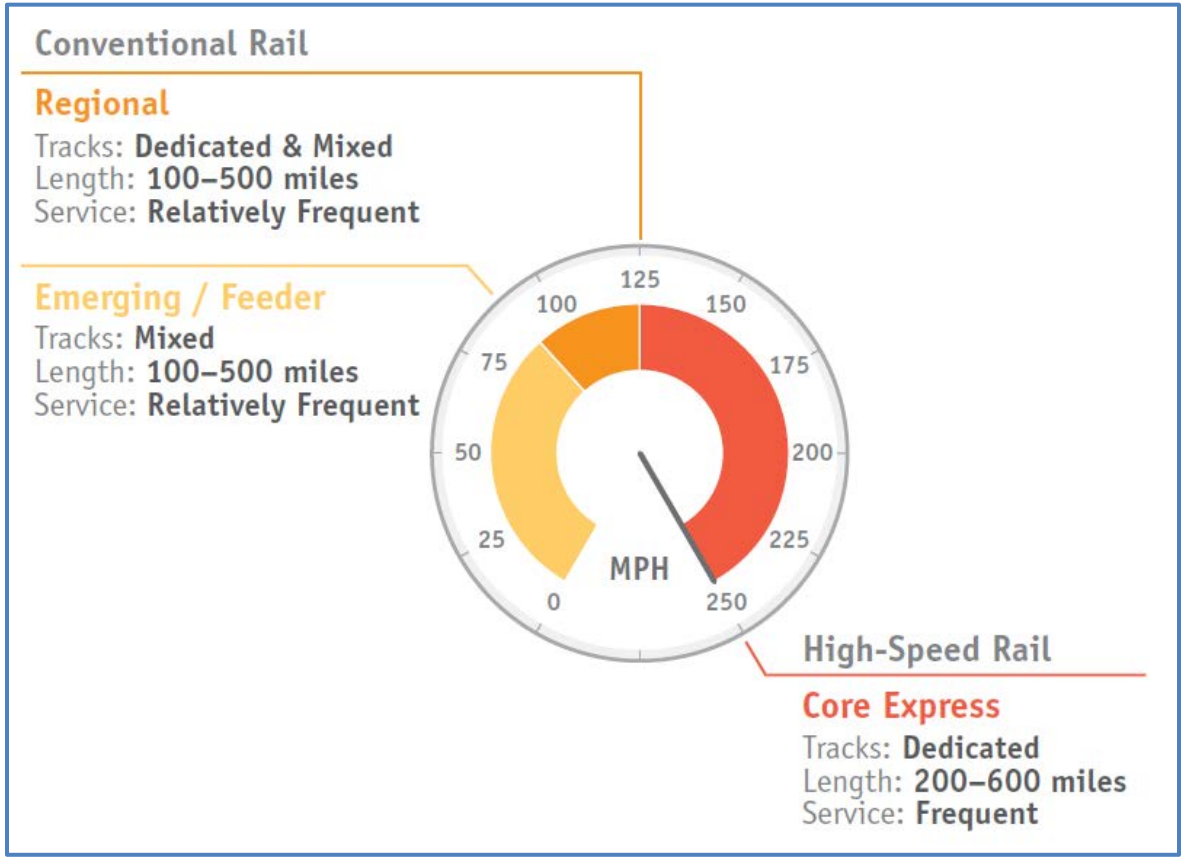
Passenger Rail

Aspiring for greater and faster connections to Washington, DC, the Northeast Corridor and to the Southeast High Speed Rail Corridor, the Virginia Department of Rail and Public Transportation (DRPT) is investigating higher-speed and enhanced intercity passenger rail for Hampton Roads. Short-term efforts include enhancing rail service to the Peninsula and establishing conventional rail on the Southside.

The Virginia Statewide Rail Plan identifies rail enhancements and the installation of a third track segment between Washington, DC, Richmond, and Newport News. Upon completion of improvements in the Richmond to Newport News corridor, including funding identification, three regional trains from Richmond's Staples Mill Station will be extended to Newport News for a total of five daily roundtrip trains to serve Newport News, Richmond, and Washington, DC.

Recognizing that the lack of passenger rail service to south Hampton Roads, DRPT is partnering with Norfolk Southern, CSX and Amtrak to extend Richmond's Amtrak Virginia regional service to Norfolk. Starting approximately in the fall of 2013, one daily roundtrip conventional speed (limited to 79-mph) train will allow Norfolk passengers a one-seat ride up the Northeast Corridor as far north as Boston. According to the Virginia Statewide Rail Plan, upon securement of funds and construction of capacity improvements at the Appomattox River Bridge in Petersburg, service to Norfolk will increase to three daily roundtrip trains.[10]

Figure 11.4: US Definitions of High-Speed and Intercity Passenger Rail Corridors



Source: High-Speed Rail, International Lessons for US Policy Makers, 2011

[10] Richmond/Hampton Roads Tier I Draft EIS.

Richmond to Hampton Roads Rail Project

Presently, DRPT has developed the Richmond/Hampton Roads Passenger Rail Project Tier I Draft Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA).

To support the Commonwealth's efforts, the HRTPO approved a resolution in October 2009, in support of establishing higher-speed passenger rail service between Richmond, Petersburg and Norfolk along the US Route 460/Norfolk Southern corridor and enhancing the existing intercity passenger rail service between Richmond and Newport News along the Interstate 64/CSX corridor.

In February 2010, based on the evaluation and public comments received, the Commonwealth Transportation Board approved the preferred alternative for enhanced conventional passenger rail service between Richmond and Newport News and higher-speed passenger rail service between Petersburg and Norfolk. The Tier I Draft EIS has been submitted to the Federal Railroad Administration and is awaiting a Record of Decision.

On the Peninsula, the Tier I Draft EIS recommends an additional round-trip train per day (for a total of three) at conventional speeds (limited to 79-mph) on the Peninsula, with higher speed rail service on the Southside from Norfolk to Richmond.

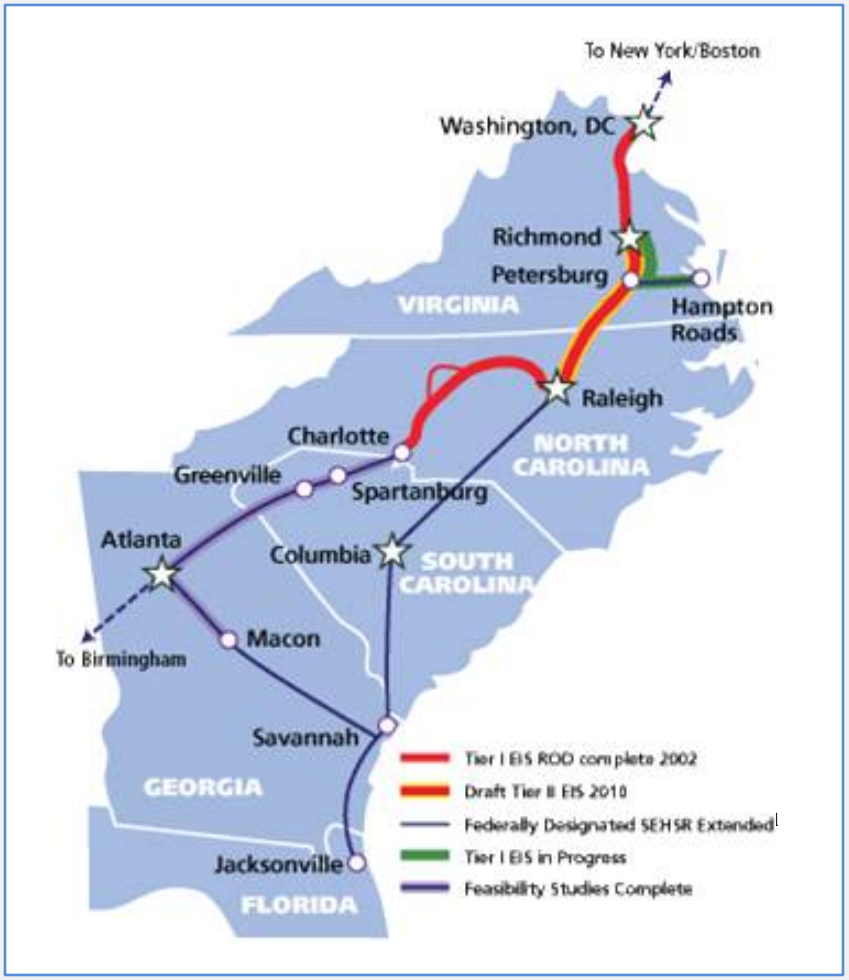
Amtrak Acela Express

Southeast High Speed Rail Project

The Southeast High Speed Rail Corridor (SEHSR) is one of eleven proposed high speed passenger rail corridors designated by the U.S. Department of Transportation (USDOT).

The corridor was designated as running from Washington, DC through Richmond, VA and Raleigh, NC to Charlotte, NC with maximum speeds of 110-mph. It is part of an overall plan to extend service from the existing high-speed rail on the Northeast Corridor (Boston to Washington) to points in the Southeast. To implement the SEHSR, the corridor will involve reconstructing, upgrading, and constructing rail lines between Washington, DC and Charlotte, NC. The estimated cost of the SEHSR is between $2.6 and $7.5 billion.

The North Carolina Department of Transportation and the Virginia Department of Rail and Public Transportation are jointly collaborating in the development of the dual-phased Environmental Impact Statement for the SEHSR. Additionally, the Virginia-North Carolina High Speed Rail Compact, consisting of state legislators for each state, convenes biannually for the purposes of examining and discussing strategies to advance the multi-state high speed rail project.



Reliability Strategies

As part of the transportation planning process, the region has established strategies to promote a reliable transportation system. These strategies will be implemented to manage and alleviate regional congestion, assess the structural soundness of infrastructure, and ensure a secure network for the movement of people and goods.

System Preservation

Preserving the existing transportation system is critical in order to maintain regional mobility at its highest possible level. This becomes more difficult as transportation infrastructure throughout the region ages. Not only must this infrastructure be monitored on a regular basis, but increasing maintenance demands continue to overwhelm the transportation budget.

Infrastructure Monitoring

Roadways

Roadways are inspected on a regular basis to monitor pavement condition and roughness. For state-maintained roadways (which includes all roadways within the counties and interstates within the cities), VDOT hires a contractor that uses continuous digital imaging and automated crack detection technology. The contractor collects data using vans equipped with digital cameras to capture downward images for crack detection and forward images for right of way views. Sensors are also mounted on the vehicle to capture pavement roughness and rutting data. Data collected by these cameras and sensors are processed with specialized software to identify cracks and other pavement distresses.

Data is collected for VDOT on the entire statewide interstate and primary highway systems annually. Approximately 20%-25% of the secondary roadway system is also collected each year.

Pavement Measure Truck

VDOT uses two methods to evaluate pavement condition on state-maintained roads:

- Critical Condition Index (CCI)
- International Roughness Index (IRI)

The Critical Condition Index (CCI) ranges from 0 to 100 and is based on pavement type (asphalt or concrete) and pavement distress. Pavement with a CCI value below 60 is considered deficient. These deficient roadways are then evaluated for maintenance and rehabilitation.

The IRI is based on the amount of pavement irregularities in the roadway surface in terms of inches per mile. Pavement with an IRI of 140 inches per mile or above on interstates and primary roadways is considered deficient in terms of ride quality. An IRI of 220 inches per mile or above on secondary roadways is also considered deficient.

Cities in Hampton Roads are responsible for monitoring the condition and roughness of the pavements on city-maintained roadways, and use a variety of methodologies and technologies to perform this function.

Bridge Inspections

As stated in Chapter 8 (Reliability Challenges), bridges are inspected at least once every two years by qualified inspection teams (some bridges may require more frequent inspection based on their condition or design). Underwater inspections are also performed where necessary at least once every five years.

Based on their measurements and observations, bridge inspectors assign ratings to describe the existing condition of each structure. These ratings determine whether a bridge is classified as "structurally deficient", "functionally obsolete", or not deficient.

Tunnel Inspections

All tunnels in Hampton Roads are currently maintained by VDOT except for the Chesapeake Bay Bridge-Tunnel. These tunnels are inspected regularly by qualified inspection teams, usually every one to five years based on the condition of the tunnel.

In addition, VDOT conducts a continual operations and maintenance program at the region's tunnels. The regional tunnel maintenance and operations program includes maintaining and replacing safety and operation systems such as fire suppressant, flood prevention, and drainage systems; removing or replacing tunnel roof panels; upgrading lighting; testing floodgates; and improving pavement and structural components. This effort has increased in recent years in response to the flooding in the Midtown Tunnel during Hurricane Isabel, and flooding in the westbound Hampton Roads Bridge-Tunnel due to a burst pipe.

In addition to the above mentioned strategies to address roadway infrastructure, there are also safety and system management strategies in place to help improve reliability and maximize efficiency of the regional transportation system.

Bridge Inspection, VDOT

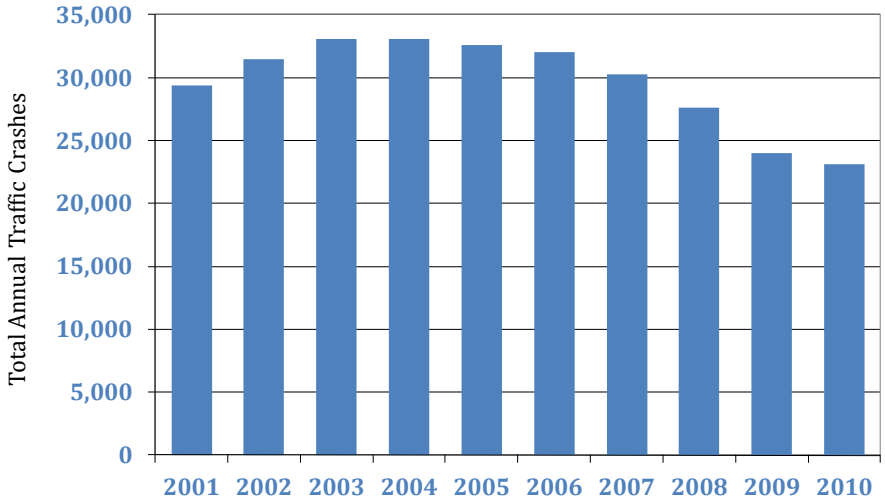
Roadway Safety

There were a total of 23,142 crashes in Hampton Roads in 2010, resulting in 13,449 injuries and 121 fatalities. In other words, a crash occurred on average every 23 minutes in Hampton Roads in 2010, with an injury every 37 minutes and a fatality every three days. Although the number of crashes, injuries, and fatalities are at lower levels than seen in the last decade (**Figures 12.1 and 12.2**), continuing this reduction is important because of the impacts that roadway safety has on both the transportation system and the quality of life in Hampton Roads.

The HRTPO began incorporating roadway safety into the transportation planning process a decade ago with the *Hampton Roads Regional Safety Study*. This three-part study reviewed roadway safety trends; compared roadway safety in Hampton Roads with statewide and national data; analyzed the location of crashes throughout the region; and examined countermeasures and potential solutions to remedy safety-related issues at high crash locations. Based on the success of this effort, HRTPO staff produced the *Hampton Roads Rural Safety Study*, which examined similar issues in the rural areas of the region. These reports are updated by the HRTPO staff on a regular basis.

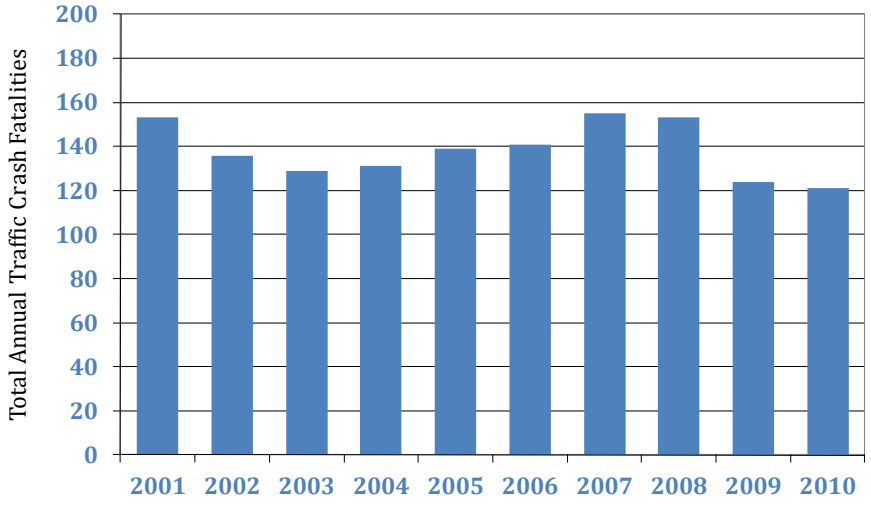
Roadway safety is also included in other HRTPO transportation planning tasks. Crash data collected by VDOT and the Virginia Department of Motor Vehicles (DMV) is analyzed by HRTPO staff; this data is used in the Project Prioritization Tool (details pertaining to the Project Prioritization Tool are discussed in Chapter 15) and as criteria for evaluating potential projects for Regional Surface Transportation Program (RSTP) funding. Congested corridors throughout the region are ranked as part of the CMP based on many factors, including safety. Many corridors and subareas studied by HRTPO staff include safety analyses as well.

Figure 12.1: Traffic Crashes in Hampton Roads



Source: Virginia DMV.

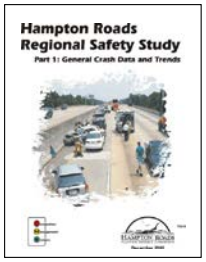
Figure 12.2: Traffic Crash Fatalities in Hampton Roads

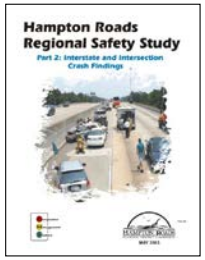


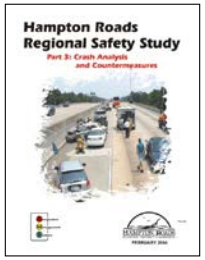
Source: Virginia DMV.

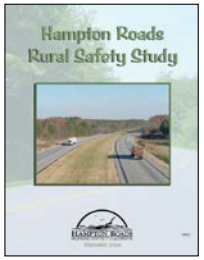
In addition, HRTPO staff assists VDOT and localities with roadway safety efforts. One way this is accomplished is through participating in Road Safety Audits (RSAs). RSAs are formal safety performance examinations of unsafe locations led by independent, multidisciplinary teams. These teams typically include engineers, maintenance personnel, and law enforcement officials from various agencies. RSAs are used to qualitatively and quantitatively report on road safety issues based on data analysis, site examinations, and discussions with those familiar with the location, and identify potential safety improvements.

Roadway safety projects are primarily funded through the Highway Safety Improvement Program (HSIP), which is a federal program that apportions $30-$35 million annually to Virginia. VDOT allocates these funds each year to eligible projects based on a variety of factors, including the project's benefit/cost ratio, total targeted severe crashes, cost range, and improvement type.










Incident Management Truck

System Management

As congestion increases and major roadway projects become more costly and difficult to construct, maximizing the capacity of the existing roadway network becomes critical. The purpose of system management, also known as transportation systems operations, is to maximize the safety, security, and mobility of roadway users by actively managing the regional transportation system. This is accomplished with a combination of technology known as Intelligent Transportation Systems (ITS), along with trained and coordinated manpower.

In Hampton Roads, regional transportation operations are led by the VDOT Hampton Roads Transportation Operations Center (TOC). The Hampton Roads TOC maintains and operates ITS infrastructures, such as closed-circuit cameras, vehicle detection devices, and changeable message signs, on 113 miles of the regional interstate network. The Hampton Roads TOC also monitors traffic conditions, responds to crashes and other incidents with the Safety Service Patrol, and distributes roadway congestion and condition information to travelers.

Many local jurisdictions in Hampton Roads also have their own transportation operations centers. These local TOCs are, or will be, connected with VDOT's Hampton Roads TOC, allowing for data and video sharing, instant communication, and more regional cooperation.

Planning for transportation operations takes place on many levels in Hampton Roads. Various committees (see pages 12-8 and 12-9) are in place to plan for and improve regional transportation operations, and several regional guidelines have been produced, including the ITS Architecture, ITS Strategic Plan, and Regional Concept of Transportation Operations.

VDOT Traffic Operations Center

ITS Architecture

A regional ITS architecture is a framework which guides the development and integration of ITS components and facilitates relationships among various agencies. Examples of ITS and operations improvements include incident management, optimizing and coordinating traffic signals, signal preemption (signal override) for emergency vehicles, automated toll collection, and providing up-to-date information to travelers via highway message signs, radio, phone, and the internet. A regional ITS architecture also helps establish a consensus concerning specific future ITS projects that are needed in the region and how they will fit into the existing system.

A link to the current Hampton Roads ITS Architecture, along with information on how the ITS Architecture was produced and maintained, is available on the HRTPO's Operations Planning website at http://hrtpo.org/TPO_OpPlanning.asp.

VDOT, with the assistance of local officials, is in the process of updating regional ITS Architectures throughout the state, including Hampton Roads. This update is expected to be complete by early 2012.

ITS Strategic Plan

The Hampton Roads ITS Strategic Plan provides the vision for ITS and transportation operations in the region. The existing ITS framework is a summary of regional transportation management challenges. The strategic vision for ITS in the short-term, mid-term, and long-term, and various implementation strategies are all included in the current Hampton Roads ITS Strategic Plan.

The current Hampton Roads ITS Strategic Plan is available on the HRTPO's Operations Planning website at http://hrtpo.org/TPO_OpPlanning.asp. An update to the ITS Strategic Plan is expected in 2012.

ITS and Operational Recommendations from the CMP

The HRTPO staff developed recommendations to alleviate congestion for the top 16 CMP Congested Corridors (top six freeways and top ten arterials) in the latest Hampton Roads Congestion Management Process (CMP): 2010 Update.

Recommendations made in the 2010 CMP Update included:

- ITS technology upgrades on Interstate System
- Interstate interchange geometric upgrades
- Lengthen acceleration ramps onto the Interstate System
- Incorporation of adaptive signal timing, phasing, and coordination on major arterial intersections
- Add and/or lengthen turn movement lanes
- Maintain bridge opening restrictions
- Incorporate non-traditional intersection reconfigurations
- Implementation of access management strategies
- Improve roadway markings and signage
- Conversion of existing arterial lanes into reversible lanes

TRAFFIX

Transportation Demand Management (TDM) programs are designed to reduce traffic congestion through a variety of mobility options, such as ridesharing, transit usage, telecommuting, and spreading out peak period traffic. In Hampton Roads, TRAFFIX is a cooperative public service, established in 1995, that implements TDM strategies by offering information and services on transportation alternatives to area commuters. TRAFFIX works with businesses and the military in the region to educate their employees regarding ridesharing and transit availability and to assist in the creation of alternate work schedules and telecommuting programs. TRAFFIX also assists with the development of Park and Ride lots, which provide ridesharers with free, all-day parking which are convenient for express buses, carpools, and vanpools.

Figure 12.3: TRAFFIX Performance Measures, 2005-Present

	2005	2006	2007	2008	2009	2010	2011*
Military Outreach							
Commands	-	-	25	48	70	86	105
Participants	-	-	450	900	1,200	1,600	2,000
NuRide							
Participants	-	3	67	254	1,755	2,016	3,643
Commuter Computer							
Participants	-	-	-	453	173	552	686
Vanpools							
Vans	14	33	40	45	48	55	61
Participants	168	396	480	540	576	660	732
Telework							
Companies	-	1	6	12	20	25	25
Participants	-	-	17	88	232	520	727
Transit							
Annual Trips	-	-	-	1,700	15,000	135,000	70,000

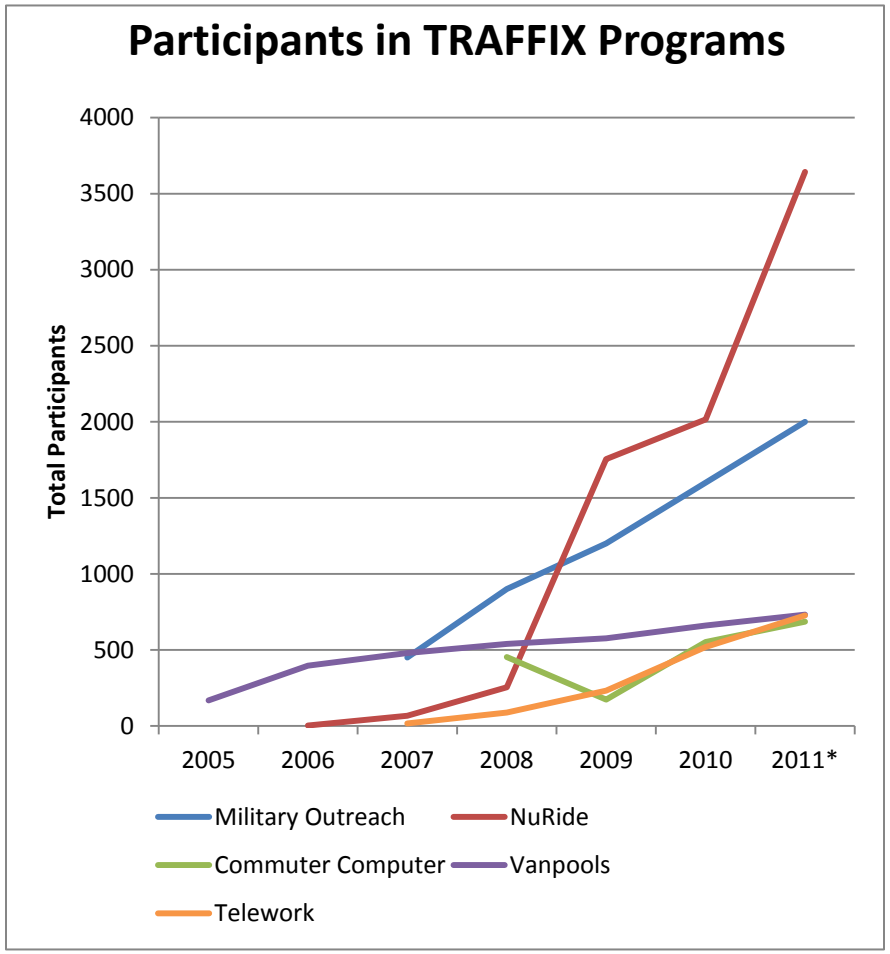
*As of June 2011

Source: Traffix. 2011 numbers reflect participants as of June 2011.

The TRAFFIX program has experienced a growth in the past four years, mainly through outreach to the military commands and the NuRide program, as seen in **Figure 12.4**. TRAFFIX has completed outreach to over 500 military commands, with approximately 2,000 current participants in TRAFFIX programs. The NuRide program, which offers rewards to commuters that rideshare, take alternate modes, and telework, has over 3,600 current participants. The Commuter Computer, which provides carpooling matches for persons who do not have a work email address (a limitation of NuRide), has almost 700 current users. The vanpool program has 61 available vans, of which all are leased, serving over 700 current users. The Telework!VA program is also at its limit (25 companies), allowing over 700 employees to telework multiple days per week.

The TRAFFIX staff estimates that 70,000 transit trips in Hampton Roads were influenced by the TRAFFIX program during the first 6 months of 2011. The details of each program are shown in **Figure 12.4**.

Figure 12.4: Participants in TRAFFIX Programs from 2005-Present



Source: Traffix. 2011 numbers reflect participants as of June 2011.

Operations Committees in Hampton Roads

The following committees work to help improve the reliability of the regional transportation system.

Hampton Roads Transportation Operations (HRTO) Subcommittee

The Hampton Roads Transportation Operations Subcommittee, HRTO (formerly ITS), is a group of local and state operations professionals (traffic engineers, traffic operations center operators, firemen, etc.) who meet to share best practices in the operation of transportation systems. The HRTO Subcommittee also advises the Transportation Technical Advisory Committee (TTAC) on operational projects.

During recent years, the HRTO Subcommittee advanced the effective usage of state dollars by scoring VDOT's candidate Intelligent Transportation System (ITS) operations projects based on cost effectiveness, and prepared a prioritized list of these projects for VDOT.

Other recent HRTO-related efforts:

- HRTPO staff tested improvements to VDOT's Hurricane Lane Reversal Plan and, based on that analysis, the HRTO Subcommittee recommended changes to the VDOT plan which staff estimated would reduce evacuation time by seven to thirteen hours.
- In response to heavy congestion resulting from the simultaneous closure of the Gilmerton Bridge and the Downtown Tunnel on October 3, 2009, the HRTO Subcommittee and VDOT staff established a "Regional System of City-Maintained Highways for which Cities will Routinely Notify VDOT of Planned Closures". This system is designed to reduce the costly time spent by local drivers in queues created by highway maintenance.

Hampton Roads Regional Concept of Transportation Operations (RCTO)

Due to high profile incidents on freeways throughout the region, incident management has become an important transportation topic in recent years. In 2004, the HRTO Subcommittee initiated the development of a Regional Concept of Transportation Operations (RCTO), which – as defined by FHWA – is a tool that assists in planning and implementing transportation management and operations strategies in a collaborative and sustained manner.

The RCTO Committee, which is led by VDOT, is comprised of various stakeholders from the Virginia State Police, local police, fire and rescue agencies, traffic engineers and planners, HRTPO staff, as well as other operators and first responders.

The motivation for the Hampton Roads RCTO Committee is to reduce the number of injuries incurred by responders, while decreasing the clearance times associated with these incidents, and to improve the operational coordination among those same responders. One of the major accomplishments of the Hampton Roads RCTO Committee has been regular post-incident reviews to determine where improvements can be made.

In the summer of 2008, a "Resource Document" of the RCTO Committee (Executive Summary Report: June 2008 – available at www.hrtpo.org/TPO_Reports.asp) was completed that identifies action items for providing more efficient traffic flow movement during incidents and for improving incident clearance times. Specifically, this document established six objectives for the Hampton Roads RCTO Committee:

- **Objective 1** - Increase Responder Safety by Eliminating Struck-By Incidents and Fatalities
- **Objective 2** - Decrease Incident Clearance Time
- **Objective 3** - Decrease Secondary Incident Occurrences (those incidents that occur as a result of a previous incident)
- **Objective 4** - Improve Inter-Agency Communication During Incidents
- **Objective 5** - Identify Existing Regional Incident Management Resources and Establish Plan for Inter-Agency
- **Objective 6** - Establish a Regional Incident Management Pro-Active and Post-Incident Review Consortium

Hampton Roads Highway Incident Management (HRHIM) Subcommittee

The Hampton Roads Highway Incident Management (HRHIM) Subcommittee meets quarterly to discuss highway incident response, clearance, and safety issues. Participating agencies include Virginia State Police, Virginia VDOT, HRTPO staff, law enforcement agencies, fire and rescue agencies, medical examiners, and towing agencies. The subcommittee has a rich history of cooperation and coordination, producing the region's first Multi-Jurisdictional Memorandum of Understanding for Highway Incident Management in December of 1999.

TRAFFIX Oversight Subcommittee (TOS)

The TRAFFIX Oversight Subcommittee (TOS) is comprised of regional transportation professionals from Hampton Roads jurisdictions, VDOT, HRT, WATA, TRAFFIX staff, HRTPO staff, DRPT, FHWA, and other invited participants. At TOS meetings, TRAFFIX staff provides status updates and measures of effectiveness on current and future TRAFFIX programs, and TOS members suggest ways for TRAFFIX to improve alternate modes of travel in the region.

Security and Critical Infrastructure Management

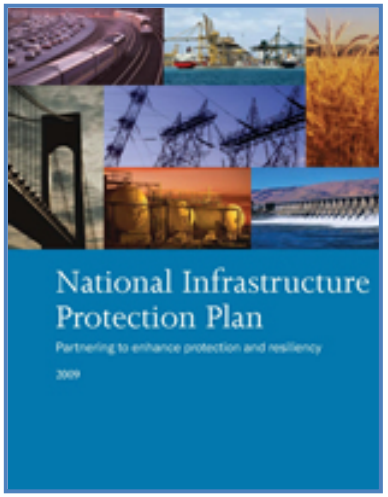
Protecting and ensuring the resiliency of the critical infrastructure and key resources (CIKR) within Hampton Roads is vital to the health, safety, economic vitality and security of the region. Compromises to the regional transportation system could be disruptive to the movement of people and goods. Various federal, state, and regional plans and efforts have been developed to protect infrastructure and the population.

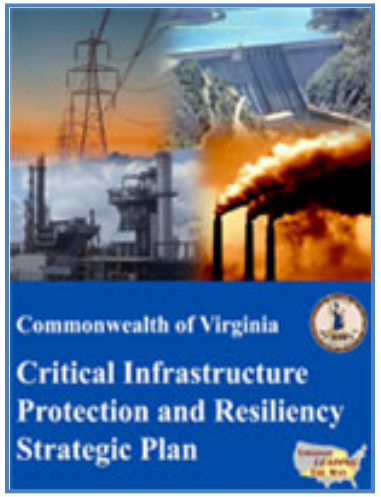
Infrastructure Protection Plans

The National Infrastructure Protection Plan (NIPP), published in 2009, aims to provide a framework for various levels of government. Transportation is among the 18 critical sectors identified within the NIPP. The purpose of this effort is to identify critical infrastructure and develop strategies to mitigate risk and secure critical infrastructure and key resources in a collaborative and proactive manner.

The *Virginia Critical Infrastructure Protection & Resiliency Strategic Plan* has been developed to mirror the NIPP and to define the Commonwealth's strategy, as well as to direct implementation of supporting plans.

Currently, Hampton Roads stakeholders are working with the Office of Veterans Affairs and Homeland Security to address CIKR, including the transportation sector, from a regional perspective.



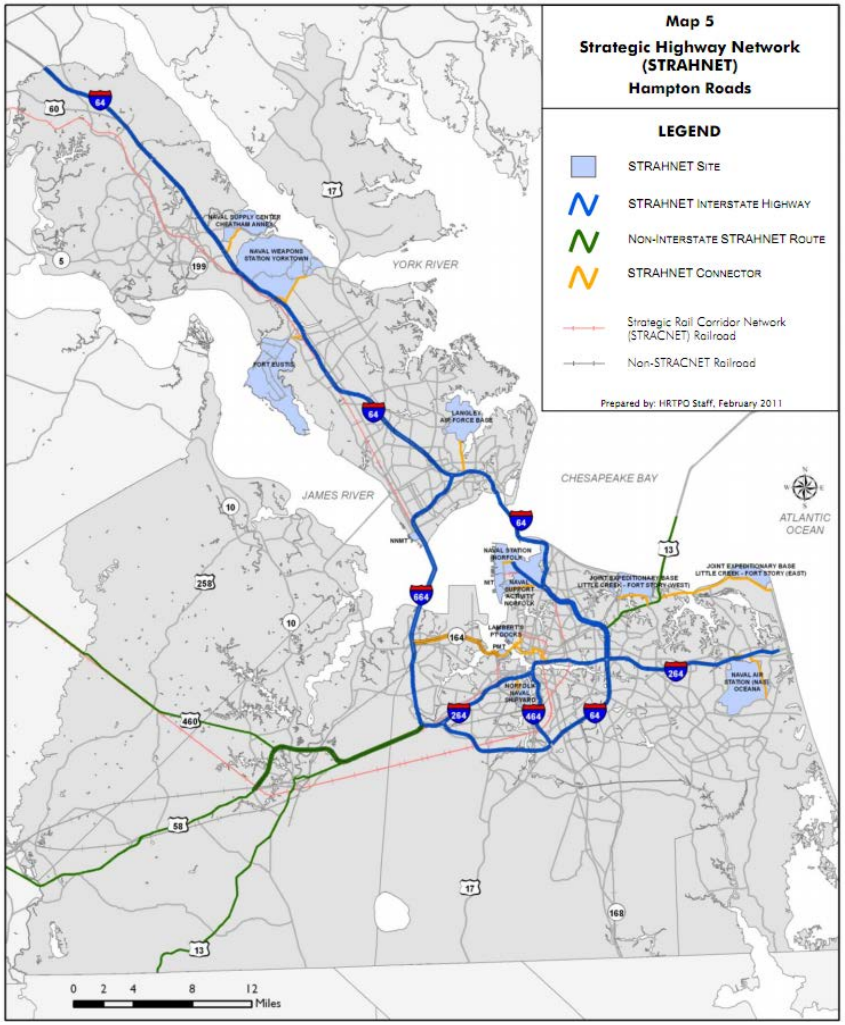


Strategic Transportation Network

The Strategic Highway and Rail Corridor Networks within Hampton Roads are the critical transportation links that allow the efficient and expedient mobility of military supplies and personnel from the regional bases and port facilities to the rest of the nation in times of a national emergency. The Strategic Highway Network (STRAHNET) includes both interstate highways as well as other non-interstate primary routes leading into and out of strategic locations. STRAHNET and STRAHNET Connectors are the total minimum defense highway network to support defense emergencies. The Strategic Rail Corridor Network (STRACNET) is an interconnected and continuous rail network critical for movement of essential military equipment to ports as well as defense installations located around the country.

The Hampton Roads region contains 14 STRAHNET sites, consisting of major military installations and port facilities. The STRAHNET system that serves those locations consists of all interstate highways (I-64, I-264, I-464, I-564, I-664), several non-interstate STRAHNET routes (13, 58, 460), and STRAHNET Connectors (**Map 12.1**). Additionally, the Hampton Roads region contains Norfolk Southern and CSX rail lines within STRACNET. These roadways and railways serve as the minimum defense public highway and railway network needed to support a defense emergency and are used for day-to-day military cargo movement in Hampton Roads.

Map 12.1: Strategic Highway Network



Public Transportation Security

Public transportation systems host a number of users daily. In Hampton Roads, an average of approximately one million passengers use the Hampton Roads Transit (HRT) and Williamsburg Area Transit Authority (WATA) transit systems monthly.[1] Transit services are also provided to numerous military and federal facilities across the region. Interruptions to regional transit service could have serious repercussions to the mobility and livelihood of its users as well as to the security of the region.

To assist in mitigating security risks to the public transportation network, the Federal Transit Administration (FTA) has started to provide direct assistance to transit agencies, forming technical committee teams, holding regional forums for emergency responders, and providing grants for training and research projects.[2] Additionally, the FTA has developed a list of security program action items that transit agencies should incorporate into their System Security Program Plans. Because of the openness of transit facilities, timely threat and intelligence information is critical in order for transit agencies to strategically allocate resources.[3]

HRT

HRT has completed a System Security and Emergency Preparedness Plan (SSEPP) reviewed and approved by the Virginia Department of Rail and Public Transportation (DRPT) as well as the FTA. The SSEPP establishes methodologies for threat and vulnerability assessments for the light rail system. HRT also has a security plan for buses and ferry, which is updated annually.

WATA

Williamsburg Area Transit Authority (WATA) is included in the *James City County Community Service Emergency Plan* which defines roles and responsibilities for transit personnel. WATA personnel have participated in the following safety and security training over the past three years:

- System Security Awareness for Transit Employees
- National Incident Management System
- Virginia Operations Plan Exercise
- Pandemic Influenza-Tabletop
- Evacuation Planning & Disaster Recovery Regional Emergency Management Technical Advisory Committee
- Connecting Communities Public Transportation Emergency Preparedness Workshop

WATA also has a contingency fleet consisting of two heavy-duty (body-on-chassis) vehicles that are part of the regional emergency plan since the service area is within the hurricane corridor of Hampton Roads and is also within a ten mile radius of the Surry nuclear power plant.

Rail Security

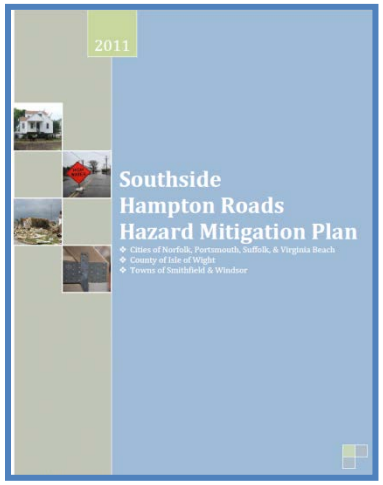
The security of the rail lines in Hampton Roads is also vital for the safety of people and the mobility of goods into and out of the region. Regional rail companies, such as CSX, have forged rail security partnerships with federal, state, and local law enforcement.[4] These rail security partnerships share highly specialized and secure train and rail car monitoring, coordination and training of regional law enforcement, security upgrades to rail facilities, and advocating to policymakers on various issues that can impact rail security.

[1] Based on Ridership data from HRT and WATA

[2] Source: U.S. DOT, FTA

[3] Source: U.S. DOT, FTA

[4] Source: CSX Incorporated



Regional Hazard Mitigation Plans

The Southside Hampton Roads Hazard Mitigation Plan, the Peninsula Natural Hazard Mitigation Plan, and the City of Poquoson Multi-Hazard Mitigation Plan incorporate hazard mitigation principles and practices into routine government activities and functions. These hazard mitigation plans recommend specific actions designed to mitigate risks to residents, business owners, and the built environment from those hazards that pose the greatest inherent risks as communities develop into the future.

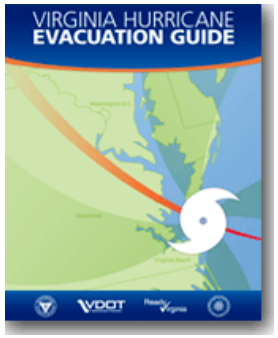
Regional Catastrophic Framework

Parallel to the Regional Hazard Mitigation Plans in Hampton Roads, the region also has prepared a *Regional Catastrophic Framework for Southeastern Virginia and Northeastern North Carolina*. The U.S. Department of Homeland Security has assessed that Hampton Roads is at high risk for both natural and man-made disasters. Therefore, this Framework looks to advance catastrophic incident planning and preparedness within the region. The goal of the framework is to support an integrated emergency planning system that enables regional all-hazard planning for catastrophic events and the development of necessary plans, protocols, and procedures to manage potential catastrophic events.

Components of the Regional Catastrophic Framework include:

- Development of traffic management plans for catastrophic events for regional communities
- Defining a coordinated disaster response
- Delegating disaster response roles
- Caching supplies into a regional pool for an efficient response in light of austerity and resource scarcity

Hurricane Evacuation Plan



Virginia has also developed a Hurricane Evacuation Plan for the state. Considering the regional topography, population density, and coastal vulnerabilities to major hurricanes, Hampton Roads may require evacuation of its residents in the event of a severe hurricane due to storm surge and other hurricane related impacts. The complexity and vulnerability of the bridges and tunnels in the region could hamper or even prevent evacuation efforts if not coordinated properly.

In addition to the state evacuation plan for Hampton Roads, the region must also collaborate with eastern North Carolina to allow for the coordinated, efficient, and expeditious evacuation of tourists and residents from the Outer Banks area. The North Carolina/Virginia Border Traffic Control Plan is a bi-state plan that manages evacuation traffic from the Outer Banks into Virginia without compromising the evacuation traffic and transportation system within Hampton Roads. This plan involves directing traffic onto US 158 in Barco, NC, diverting evacuation traffic away from the Chesapeake Expressway and the Hampton Roads Beltway.

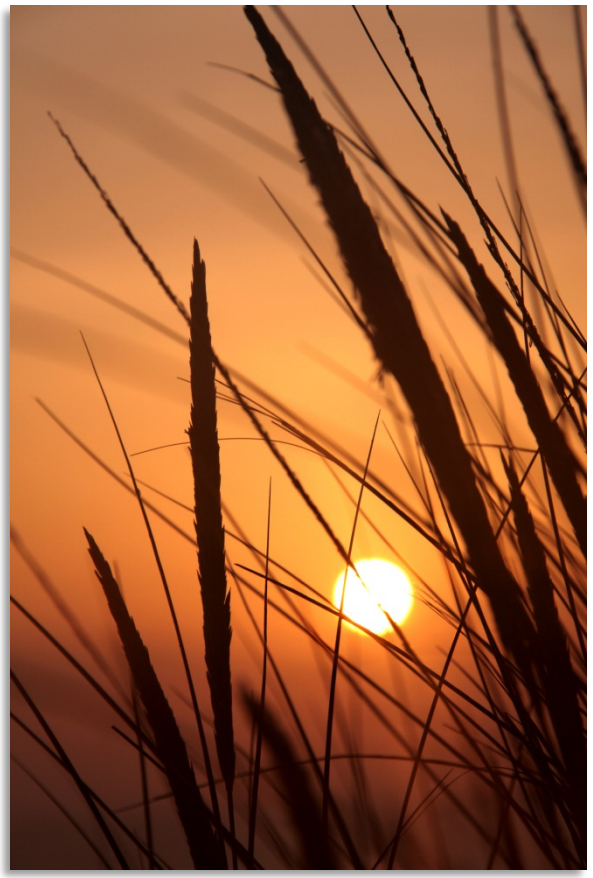
Continued coordinated planning between local and state governments remains necessary in order to properly prepare for the potential threat of a catastrophic hurricane.

Map 12.2: Hurricane Evacuation Routes

Hurricane Irene Evacuation, Outer Banks

Environmental Strategies

In order to minimize impacts to natural resources in Hampton Roads, it is essential for the region to have effective mitigation strategies in place. Chapter 9, Environmental Challenges, detailed many environmental challenges the region faces, including: maintaining good water and air quality, protecting environmentally sensitive lands, and addressing the potential impacts of climate change (namely sea level rise and increased vulnerability to flooding). Through collaboration with local, regional, state, and federal partners, Hampton Roads can outline policies and allocate resources to help protect the environment and improve the quality of life in Hampton Roads.



Water Quality Management

In response to the negative impacts on water quality by industry and development, the federal government and the Commonwealth of Virginia have taken steps to improve the health of the Chesapeake Bay and its tributaries. In 2011, Virginia adopted revised stormwater management regulations that will require new developments and redevelopments, including roadways and other transportation infrastructure, to meet more stringent requirements regarding nutrient pollution and runoff.

Based on these new regulations, new construction, including transportation projects, cannot increase current levels of nutrient pollution and runoff. Furthermore, any redevelopment must reduce current levels of nutrient pollution and runoff associated with the existing development by 20 percent.

Air Quality Management

Regional air quality is largely affected by the presence of greenhouse gases[1]. As such, Virginia has set a goal of reducing greenhouse gas emissions 30% by the year 2025. Transportation is one of the largest sources of greenhouse gas emissions in Virginia, so reductions in emissions from the transportation sector will be necessary for any state-wide reduction plan to succeed. The *Governor's Commission on Climate Change* outlined several strategies to reduce greenhouse gas emissions from the transportation sector, including reducing Vehicle Miles Traveled (VMT) and increasing the fuel efficiency of automobiles. Other transportation-related strategies that were discussed include:

- Improving transit, pedestrian, and bicycling facilities
- Expanding opportunities for teleworking and/or flexible schedules
- Promoting transit-oriented development
- Requiring greenhouse gas emissions to be incorporated into transportation project environmental analysis
- Adopting "complete streets" policies
- Coordinating state transportation plans with local land use plans
- Enforcing existing speed limit
- Enforcing anti-idling statues
- Incentivizing the purchase of fuel-efficient vehicles

As part of the long-range transportation planning process, all LRTPs must conform to state air quality standards. This process is referred to as Air Quality Conformity and is discussed in detail in Chapter 19.

Adapting to Climate Change

In addition to affecting air quality, greenhouse gas emissions are also the main drivers of climate change. While reducing global greenhouse gas emissions can mitigate climate change, some adaptation will still be required to handle those effects that are already beginning to occur. Higher temperatures and different rainfall patterns may require changes in how roads and other transportation infrastructures are designed, constructed, and maintained. Adapting to the impacts of climate change, specifically sea level rise, may in the long run require moving or rebuilding some of the region's roads.

[1] Greenhouse gases include carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), nitrogen oxides (NO_x), and ozone (VOC).

Environmental Mitigation

Environmental Mitigation links transportation planning to the environment via consultation and discussion with environmental agencies. Per SAFETEA-LU, the authorization that governs the Nation's surface transportation funding, environmental agencies must be consulted regarding the development of the LRTP as well as the environmental mitigation discussion itself.

The goals of this program are to:

- Identify open space areas that can be preserved
- Reduce impacts where transportation and sensitive lands intersect
- Emphasize the importance of integrating/consideration of wildlife and habitat into the design of transportation facilities
- Maintaining, or improving, water and air quality
- Protecting historical and cultural resources
- Encourage member localities to ensure that transportation projects are consistent with the LRTP and other federal, state, and local plans

Consultation: Development of the LRTP

Staff from the region's localities participated in the development of the 2034 LRTP, including: allocating the forecasted 2034 land use and socioeconomic data, developing the Project Prioritization Tool, and selecting projects for the draft plan. Additional agencies were also consulted in the development of the LRTP, indicated in **Figure 13.1**.

A map and table of the candidate projects for inclusion in the 2034 LRTP were sent to the following agencies on June 11, 2010 with a request for feedback on projects based on their respective area of expertise, with a response date of July 7, 2010[2]:

Figure 13.1: Additional Agencies Consulted in the Development of the 2034 LRTP

- Virginia Department of Environmental Quality (VDEQ)
- Virginia Marine Resources Commission (VMRC)
- Virginia Clean Cities (VCC)
- Virginia Department of Conservation and Recreation (VDCR)
- Virginia Department of Forestry (VDOF)
- Virginia Department of Historic Resources (VDHR)
- Virginia Department of Game and Inland Fisheries (VDGIF)
- Virginia Council of Indians (VCI)

Consultation: The Environmental Mitigation Discussion

In addition to the solicitation for feedback regarding candidate projects, several environmental agencies, listed in **Figure 13.2**, were also asked to comment on text (referred to as the Environmental Mitigation Discussion text) that explains the relationship between environmental and transportation planning, as well as the need and purpose in coordination between the two fields. The environmental mitigation discussion text and associated summary table are based on text developed by VDOT staff for use by MPOs around the state. The text and table explain the metropolitan transportation planning process as well as the need and use of the regional LRTP. Furthermore, the text explains the environmental considerations at varying stages of project development, including examples of potential environmental mitigation activities.

[2] Correspondence to the Virginia Council of Indians was sent April 6, 2011 with a requested response date of April 30, 2011.

A map and table of the candidate projects for inclusion in the 2034 LRTP were sent to the following agencies on June 11, 2010 with a request for feedback on projects based on their respective area of expertise, with a response date of July 7, 2010[3]:

Figure 13.2:Environmental Agencies Consulted in the Development of the 2034 LRTP

- US Environmental Protection Agency (USEPA)
- US Army Corps of Engineers (USACE)
- US Department of Agriculture (USDA)
- National Park Service (NPS)
- US Fish and Wildlife Service (USFWS)
- US Geological Survey (USGS)
- Federal Highway Administration (FHWA)
- Virginia Department of Environmental Quality (VDEQ)
- Virginia Marine Resources Commission (VMRC)
- Virginia Clean Cities (VCC)
- Virginia Department of Conservation and Recreation (VDCR)
- Virginia Department of Forestry (VDOF)
- Virginia Department of Historic Resources (VDHR)
- Virginia Department of Game and Inland Fisheries (VDGIF)
- Virginia Council of Indians (VCI)

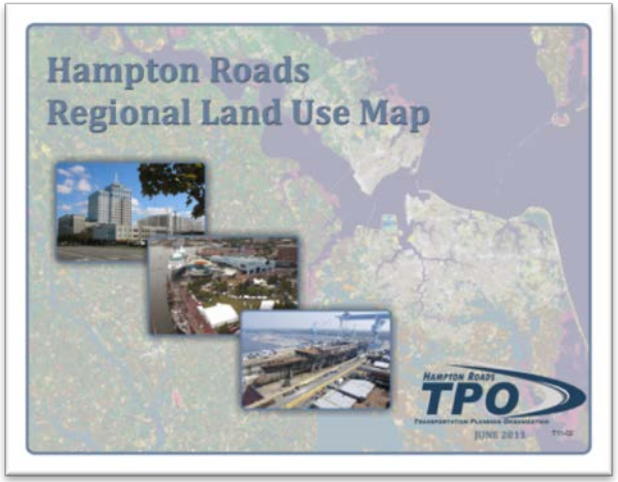
Responses Received

Responses were received from VDCR and VDEQ. A summary of the responses can be found on the following page. Copies of the complete correspondence and responses can be found in Appendix B.

Integrating Land Use and Transportation

The HRTPO has taken initial steps to better integrate land use and transportation planning by developing the Regional Land Use Map. The Regional Land Use Map depicts the existing and anticipated future land uses of the region.

Additionally, the map can be used as a tool to integrate other planning issues with land use and transportation such as: emergency management, water resource planning, green infrastructure management, housing development, and economic development. Decision-making with the use of tools such as the Regional Land Use Map can help promote cost-effective investments in the community.



[3] Correspondence to the Virginia Council of Indians was sent April 6, 2011 with a requested response date of April 30, 2011.

Table 13.1: Summary of Environmental Mitigation Responses

Agency	Division	Comment Summary	Mitigation Activity
VDCR	Planning and Recreational Resources	Lack of non-motorized transportation considerations	Researching non-motorized transportation planning and regional needs for next LRTP
	Natural Heritage	Conservation sites could be harmed by five projects	In project development stage, conduct environmental impact statement, where mitigation activities will be identified
	Soil and Water Conservation	Projects have potential to disturb soil/enhance stormwater and sediment runoff	In project development stage, conduct environmental impact statement, where mitigation activities will be identified
VDEQ	Tidewater Regional Office	Potential adverse environmental impacts due to project construction activity	In project construction stage, ensure proper environmental permitting and implement mitigation activities
VMRC		Projects have potential to encroach on waterways and impact marine fisheries	In project development stage, conduct environmental impact statement, where mitigation activities will be identified

Financial Strategies

Transportation planning recognizes the critical links between transportation and other societal goals. Not only does the transportation system provide for the mobility of people and goods, it also influences patterns of growth and economic activity by providing access to land. The performance of the system also impacts quality of life (air quality, environmental and natural resources, social equity, land use, economic development, safety, and security). Since transportation is essential to a region's well-being, financing transportation is key in advancing the region's long-term goals. Similar to other metro areas and the nation, Hampton Roads must maximize the benefit of currently available transportation funds, while working to develop new and expanded sources of revenue.

Transportation Funding Strategies

Recognizing that funding transportation is one of the key challenges facing the Commonwealth, Governor Bob McDonnell announced a plan in early 2011 to invest billions of dollars in the Commonwealth's transportation system over the next three years without raising taxes.

With support from the Virginia General Assembly and Commonwealth Transportation Board, the FY 2012-2017 SYIP allocated approximately $4 billion in additional construction funding for more than 900 projects. These projects include widening interstate highways, improving bridges and secondary roads, improving passenger rail services, purchasing right-of-way, and conducting engineering and environmental studies.

The legislation uses several financing mechanisms that enable the Commonwealth to take advantage of historically low interest rates on bonds and construction bids that are coming in well below project estimates (see graphic below).

Figure 14.1

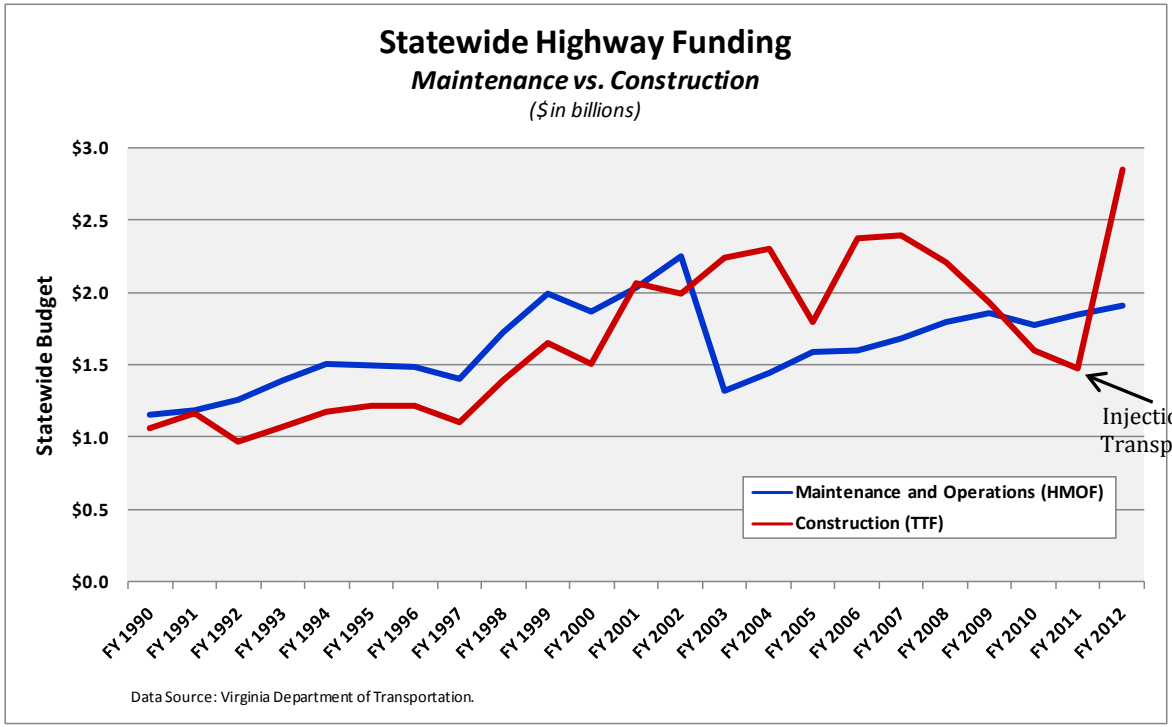
Governor's Omnibus Transportation Funding Bill
Funding Mechanisms

Accelerates the issuance of $200 million of Capital Project Revenue Bonds authorized by the General Assembly in 2007 during FY 2012 and $300 million in FY 2013, thereby enabling VDOT to issue $1.8 billion in bonds over the next three years.	Authorizes the issuance of $1.1 billion in federally-backed Direct Grant Anticipation Revenue Vehicle Bonds to better leverage Virginia's annual federal allocation and support the construction of major congestion reducing projects throughout Virginia.	Creates a new Virginia Transportation Infrastructure Bank to make low-interest loans and grants to stakeholders for transportation projects. Virginia aims to put $1 billion into the bank through a number of mechanisms over the next three years.

Largely attributable to the bond funding provided by the Governor's Omnibus Transportation Funding Bill, a significant infusion of construction funding was made in FY 2012, as shown in the graph below. The Virginia Department of Transportation's (VDOT) budget totals $4.8 billion for FY 2012, a 43% increase from the $3.3 billion FY 2011 budget. The budget provides $2.8 billion for highway construction, more than double the FY 2011 amount. It also includes $1.9 billion for VDOT highway maintenance and operations.

A February 2011 report by Chmura Economics and Analytics[1] showed that construction of the 900 projects will grow the Virginia economy by over $13 billion and support an additional 105,642 jobs statewide over the next six years. During the six year period, it is estimated that construction will generate total economic impacts of $6.2 billion in Hampton Roads ($1.035 billion per year), supporting a total of 53,610 jobs (8,935 per year) during the six year period.

Figure 14.2: Statewide Highway Funding, Maintenance vs. Construction



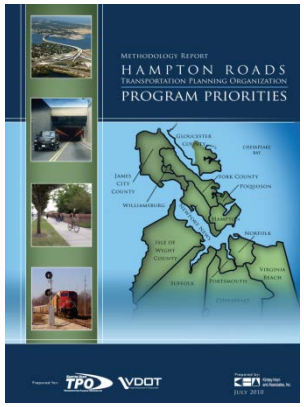
1 Chmura Economics and Analytics, Economic and Fiscal Impacts of the Construction Phase of Transportation Funding in Virginia and its Regions (February 2011).

These additional funds created by the Governor's Omnibus Transportation Funding Package will add new capacity and congestion relief, as well as accelerate and advance many phases of projects, including replacing the Lesner Bridge, widening Lynnhaven Parkway, improvements to Holland Road and Witchduck Road, investments in the Norfolk Light Rail, and bus replacements for transit operators. The Governor's transportation funding package also provides $1.4 billion to help advance several major public-private transportation projects, such as the widening of Dominion Boulevard in Chesapeake; the construction of a new tube for the Midtown Tunnel between Norfolk and Portsmouth; and construction of a new Route 460 from Suffolk to Petersburg. This investment has the potential to leverage an additional $4 billion in resources from the private sector.

Additional Funding Strategies

In addition to the Governor's Omnibus Transportation Funding Package, the HRTPO has investigated the application of other non-traditional funding sources in order to advance projects, including: local funding, tolls, and Public-Private Partnerships.

Project Prioritization



Another strategy used by the HRTPO to advance regional transportation investments with scarce financial resources is the *Program Priorities Prioritization Methodology* (Project Prioritization Tool).

In July 2009, the HRTPO, with the support of VDOT and its consultant Kimley-Horn and Associates, embarked on the development of an objective Project Prioritization Tool to evaluate regional transportation investments in Hampton Roads. The Project Prioritization Tool serves to prioritize candidate regional transportation projects based on their technical merits and regional benefits in light of scarce financial resources.

Details regarding the Project Prioritization Tool will be discussed in Chapter 15.

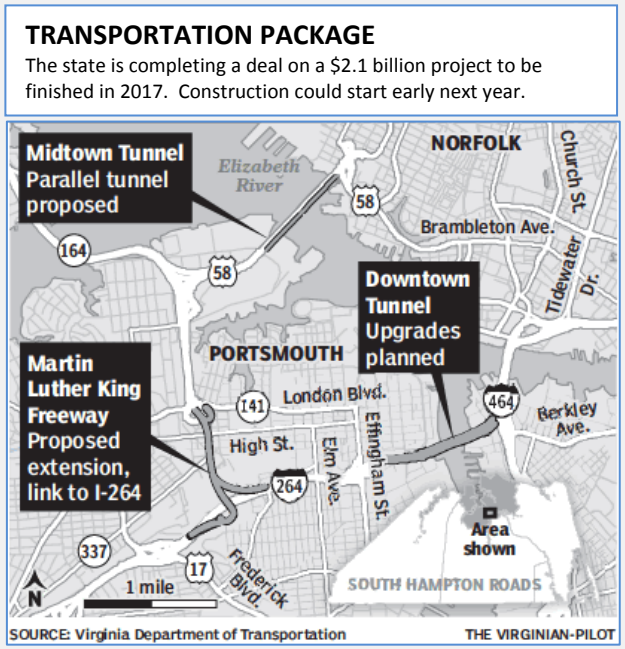
Public-Private Partnerships

Public-Private Partnerships (P3s) are a method of engaging the private sector in the construction and implementation of transportation investments. The Federal Highway Administration (FHWA) defines a P3 as a contractual agreement between a public agency and a private sector entity that allows for greater private sector participation in the delivery and financing of transportation projects. By involving the private sector into the development of transportation improvements, this partnership can bring creativity, efficiency, and funding to address challenging problems facing state and local governments. FHWA identifies several key benefits of using P3s to deliver transportation projects:

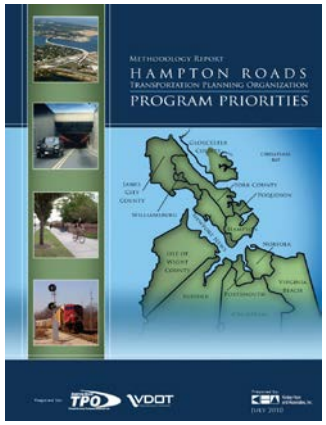
- Expedited completion compared to conventional project delivery methods
- Project cost savings
- Improved quality and system performance from the use of innovative materials and management techniques
- Substitution of private resources and personnel for constrained public resources
- Access to new sources of private capital

In the Commonwealth of Virginia, the Public-Private Transportation Act (PPTA) of 1995, as amended, is the legislative framework authorizing private entities to enter into agreements with state, local governments, and other public entities to construct, improve, maintain, and operate transportation facilities. One such P3 project in Hampton Roads is the Downtown Tunnel/Midtown Tunnel/Martin Luther King Extension. Virginia has recently executed a comprehensive agreement with a consortium of private companies to build a parallel Midtown Tunnel, extend the Martin Luther King Freeway, and improve the existing Midtown and Downtown Tunnels – thereby improving two of the region's worst traffic bottlenecks. Recognizing the benefits of a P3, Governor Bob McDonnell has stated, "*The innovative public-private agreement will advance this project years before the Commonwealth could afford to complete the work on its own.*"

Figure 14.3: Downtown Tunnel/Midtown Tunnel/ MLK Extension Transportation Package



Project Prioritization Tool



In July 2009, the HRTPO Board requested staff to develop an objective methodology to assist the Board with determining regional transportation priorities. This effort would help advance the region's transportation system in light of scarce financial resources. VDOT, and its on-call consultant Kimley-Horn and Associates, assisted HRTPO staff with developing the methodology for the Project Prioritization Tool. After approximately 18-months of regional discussion and collaboration, the HRTPO Board approved the methodology for the Project Prioritization Tool in July of 2010.

A primary goal for prioritizing transportation projects was to rank the ability of a transportation system improvement to increase system benefits for users and impact economic growth. In order to determine this ranking, it was important to identify the relationships between transportation improvements and the resulting benefits, namely decreasing travel times, increasing reliability, providing new capability, and improving regional competitiveness.

Although a great deal of research was conducted to both calibrate the Project Prioritization Tool and determine appropriate categories, weighting factors, and measurement tools, there are several elements of the tool for which there was not sufficient information, research, or data collection methods. As a result, the development of the methodology relied on a great deal of input from the LRTP subcommittee, TTAC, numerous stakeholders, and members of the public, who provided valuable suggestions and insights into the process.

Prioritization Methodology

The Project Prioritization Tool prioritizes candidate regional transportation projects based on their technical merits and regional benefits. The prioritization methodology evaluates transportation projects based on three components: Project Utility, Project Viability, and Economic Vitality.

Figure 15.1: Components of Prioritization

For the purposes of prioritization, projects are categorized into separate evaluation categories to enable decision-makers to more efficiently compare projects: Highways, Bridges/Tunnels, Transit, Intermodal, Bicycle and Pedestrian, and Systems Management[1]. This is also done to account for the varying data input needs for each category. For example, the structural integrity of bridges is evaluated differently than for highways; therefore, to maintain objectivity, these projects need to be evaluated separately.

Figure 15.2: Prioritization Project Categories

Project Categories

A set of project categories has been established to evaluate similar projects separately

- Highways
- Bridge/Tunnel
- Transit
- Intermodal
- Bicycle and Pedestrian
- Systems Management/Transportation Demand Management/Operational Improvements

For the purposes of funding, projects are further subcategorized into their roadway system classification (interstate, primary, secondary, etc.).

[1] For the purposes of the 2034 LRTP, projects were categorized based on Highways, Bridges/Tunnels, Transit, and Intermodal. Bicycle, Pedestrian, and Systems Management projects are considered 'grouped' categories; therefore, projects of this nature are not listed individually and were not prioritized.

Figure 15.3: Project Prioritization Components

Project Prioritization Components

- **Project Utility** – Considers the project's ability to solve an existing transportation issue, which could be correlated to congestion, safety, infrastructure condition, or ridership.
- **Project Viability** – Indicates the readiness of the project to be constructed based on available funding and completion of required documentation.
- **Economic Vitality** – Provides additional insight for a project's ability to support regional plans for future development and economic growth of the region.

Project Utility

Project Utility considers the project's ability to solve an existing transportation issue, which could be correlated to congestion, safety, infrastructure condition, or ridership. Improving system utility results in a better quality of life for residents including decreased travel times, increased safety, more mode and route choices, and cleaner air.

Project Utility evaluation criteria for Highways/Bridges/ Tunnels projects:

- Congestion Level
- System Continuity and Connectivity
- Cost Effectiveness
- Existing and Future Land Use Compatibility
- Safety and Security
- Infrastructure Condition
- Modal Enhancements

Supplemental transit specific evaluation criteria:

- Usage
- User Benefit
- Air Quality
- Enhancements to Other Categories

Supplemental intermodal specific evaluation criteria:

- Intermodal Movement Accommodation
- Access Improvements (Rail or Vehicular)

Project Viability

Project Viability indicates the readiness of the project to be constructed based on available funding and completion of required documentation and permits. On occasion, funding is made available by the federal government, such as the American Recovery and Reinvestment Act of 2009. In these situations, transportation funds are awarded to projects that are considered "shovel ready," meaning that construction can start immediately on a project. Since transportation funds are scarce and competitive, it is important to rank projects based on project readiness.

Project Viability evaluation criteria (same for all project categories):

- Amount of additional local/private funds committed to project
- Prior Commitment
- Federal Mandates
- Degree of Project Readiness

Economic Vitality

Regions are increasingly recognized as the fundamental unit of economic activity. Regional economies share resources, labor pools, competitive advantages, and a significant extent of their infrastructure. Transportation networks provide a means for resources to flow through the regional economy, facilitating efficient land use decisions while connecting buyers with suppliers and employers with employees. In short, the region's economy is inextricably linked to the regional transportation network as the networks determine the means by which travel occurs and economics determines the necessity of travel. In recognition of the important role that transportation plays in the metropolitan economy, regions are called to "*support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency*" as part of the transportation planning process.[2]

Economic Vitality is the ability of a proposed project to impact regional economic growth through increased capacity and/or increased opportunity.

Economic Vitality evaluation criteria for Highways/ Bridges/Tunnels projects:

- Total Reduction in Travel Time
- Labor Market Access
- Addresses the Needs of Basic Sector Industries
- Increases Opportunity

Supplemental transit specific evaluation criteria:

- Economic Distress Factors

[2] SAFETEA-LU, 2005

Supplemental intermodal specific evaluation criteria:

- Impact on Truck Movement
- Improves Interaction between Modes of Travel

Evaluation Criteria Weighting Factors

Each evaluation criterion is weighted based on relative importance, dependent on the current regional vision and availability of funding. The current weighting factors were determined based on technical and public input. These factors can be modified in the future to address changing regional priorities. Refer to Appendix D for a complete listing of category weighting factors.

Addressing SAFETEA-LU Planning Factors

As part of the development of any LRTP, it is necessary to address the planning factors established in the *Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users* (SAFETEA-LU) legislation by the federal government. These planning factors encourage regions to not only identify challenges but also strategies related to improving economic vitality, safety, security, the environment, accessibility, mobility, connectivity, system efficiency, and system preservation.

The previous chapters outline some of the transportation challenges the region faces over the next 20 years as well as some strategies that will be implemented as a response to these challenges. In addition to these strategies, the Project Prioritization Tool addresses the SAFETEA-LU planning factors on a project by project basis. **Table 15.1** details prioritization input criteria as it relates to SAFETEA-LU planning factors. **Figure 15.4** is a summary graphic of this same information.

For more details regarding the Project Prioritization Tool, please refer to Appendix C.

Figure 15.4: Relationship of Project Prioritization Criteria and SAFETEA-LU Planning Factors

		PRIORITIZATION CRITERIA															
		Congestion	Infrastructure Condition	System Continuity & Connectivity	Cost Effectiveness	Land Use	Safety / Security	Modal Enhancement	Reduce Travel Time	Labor Market Access	Needs of Industries	Increased Opportunity	Project Funding	Project Readiness	Air Quality	Prospective Ridership	User Benefit
SAFETEA-LU PLANNING FACTORS	SYSTEM PRESERVATION		✓	✓													
	ENHANCE SAFETY		✓				✓										
	ENHANCE SECURITY						✓										
	ACCESSIBILITY AND MOBILITY	✓		✓				✓		✓	✓					✓	
	ENVIRONMENTAL COORDINATION	✓				✓						✓			✓		
	INTEGRATION & CONNECTIVITY			✓				✓		✓							
	ECONOMIC VITALITY				✓	✓		✓	✓	✓	✓	✓	✓	✓			✓
	SYSTEM MANAGEMENT	✓			✓				✓								✓

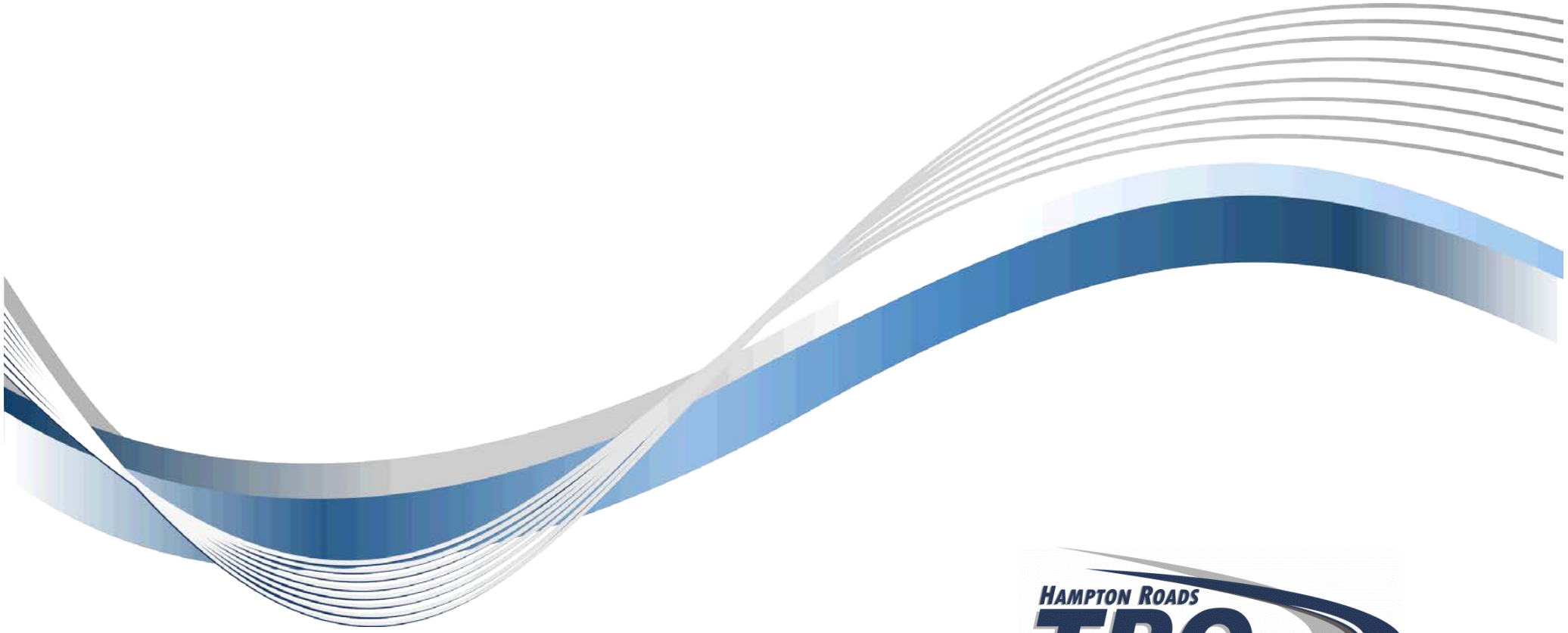
Table 15.1: Relationship of SAFETEA-LU Planning Factors to Prioritization Criteria

SAFETEA-LU Planning Factors	Prioritization Criteria
Supports the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency	• Reductions in travel time • Labor market access by improving travel time reliability and increasing access to major employment centers • Addresses the needs of basic sector industries such as defense, tourism, and ports • Supported by plans for future growth and development • Increases opportunity for business development based on new or increased access • Increases access to other modes of travel for the movement of goods
Increases the safety of the transportation system for all motorized and non-motorized users	• Crash reductions (between vehicles and pedestrians) • Crash rate reductions • Improvements to evacuation or incident management routes • Improvements to geometric deficiencies • Improvements to intermodal movement conflicts • Infrastructure condition of highways, bridges, and tunnels also addresses existing safety concerns
Increases the ability of the transportation system to support homeland security and to safeguard the personal security of all motorized and non-motorized users	• Improvements to incident management or evacuation routes • Potential regional impacts, in terms of operations, of a sudden bridge or tunnel failure • Improvements to incident management or evacuation routes as well as provisions for emergency vehicle preemption and incident detection
Protect and enhance the environment, promote energy conservation, improve the quality of life and promote consistency between transportation improvements and State and local planned growth and economic development patterns	• Reduction of vehicular emissions by reducing congestion and increasing system efficiencies • Compatible with existing land use patterns and future growth and development (based on consistency with state and local planning documents) • Supports economic growth and vitality across the region

Table 15.1: Relationship of SAFETEA-LU Planning Factors to Prioritization Criteria (Continued)

SAFETEA-LU Planning Factors	Prioritization Criteria
Increase accessibility and mobility of people and freight	• Reduction of vehicular congestion on the regional roadway network • Improves system continuity and connectivity for the regional roadway, bicycle and pedestrian, and transit networks • Encourages the use of alternate travel modes (walking and biking, transit, ridesharing, etc.) • Enhances the use of other modes (e.g., a roadway project which includes a multiuse path) • Improves rail or vehicular access to major destinations such as freight distribution facilities, airports/seaports, major industrial clients, employment and population centers, or rail stations/terminals • Improves transit, bicycle, and pedestrian access to employment and population centers • Addresses the mobility and accessibility needs of the region as a whole • Better accommodation of intermodal movements of people and freight
Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight	• Improves system continuity and connectivity for the regional roadway, bicycle and pedestrian, and transit networks • Provides multimodal accommodations (e.g., a roadway project which includes a multiuse path) • Improves rail or vehicular access to major destinations such as freight distribution facilities, airports/seaports, major industrial clients, employment and population centers, or rail stations/terminals • Improves pedestrian and bicycle access to transit as well as local and regional destinations • Better accommodation of intermodal movements of people and freight
Promote efficient system management and operation	• Reduction of vehicular congestion on the regional roadway network • Reduction in travel time • Removes conflicts between intermodal movements and thereby improve operations • Improves communications among multiple operating agencies
Emphasize the preservation of the existing transportation system	• Infrastructure condition (priority is given to facilities with poor existing infrastructure conditions (based on nationwide standards) • Improves operations without major infrastructure improvements (such as signal retiming and ITS solutions)

Section 6 – The Regional Transportation Plan



The Financial Plan

All LRTPs must be fiscally-constrained, meaning all projects must have funding identified to cover the costs associated with the projects. The financial plan identifies how much money is reasonably available to help preserve our transportation system and support additional investments over the next 20 years to keep people and goods moving as efficiently as possible.

This section documents the financial assumptions and methodologies used for forecasting revenues and expenditures for the 2034 LRTP. This includes traditional Federal and State revenues as well as newer non-traditional revenue sources to provide additional needed funding.

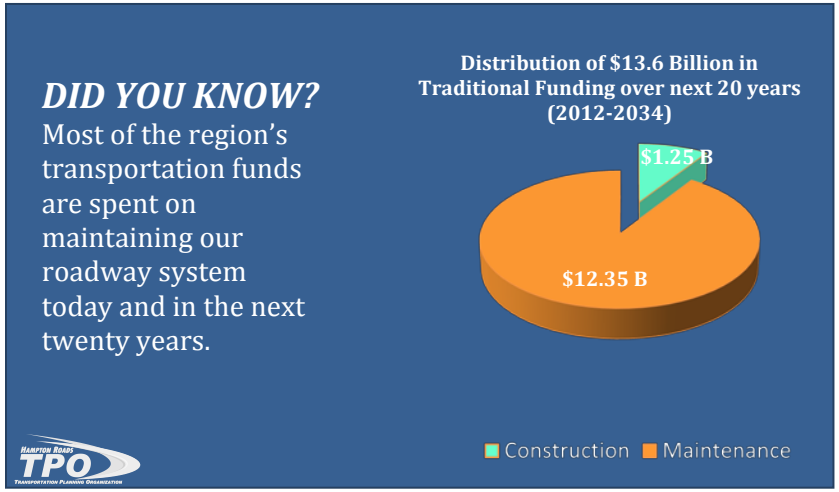
Economic Forecast

Historically, transportation investments in Hampton Roads have relied on various federal, state, and local sources. These sources are dependent on gas and sales taxes and therefore, fluctuate with the economy. As stated previously in Chapter 10, challenging economic conditions have resulted in a bleak financial forecast of traditional revenues (funds from federal and state governments) for the 2034 LRTP. As such, non-traditional sources of revenue will have to play a larger role for this and future LRTPs if the region's transportation vision is to be realized.

Traditional Revenues

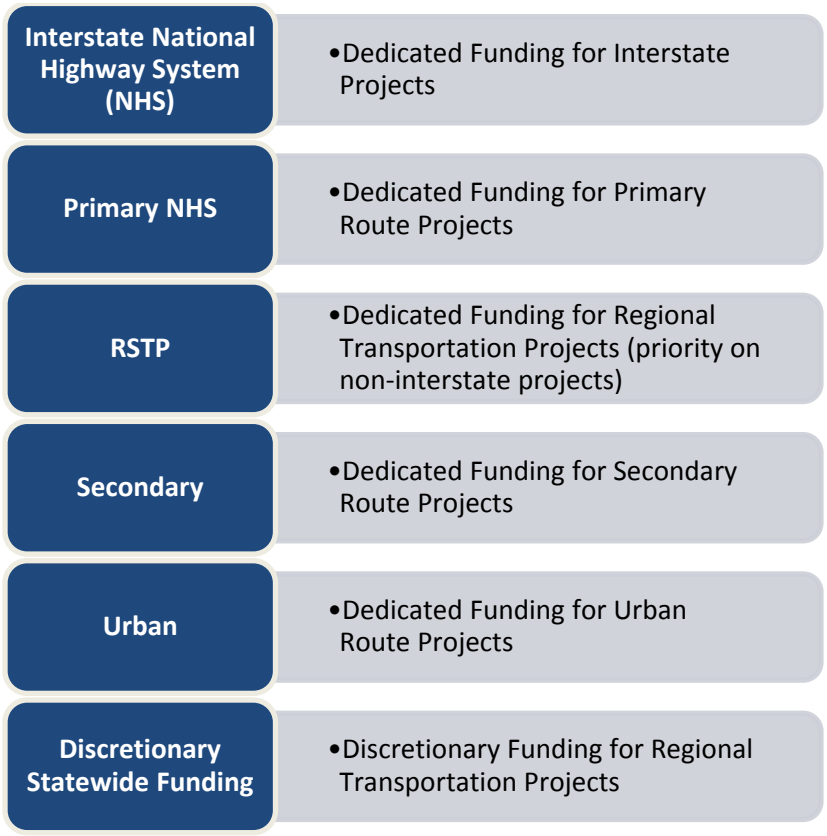
Based on VDOT's most current information regarding traditional revenues, the region can expect approximately $13.6 billion in funding for maintenance and construction of the transportation system over the next 20 years. Since maintaining existing roadways is a Federal and State mandated priority, maintenance costs must first be accounted for before new transportation projects can be considered. Assuming that current trends for maintenance funding continue, maintenance of the region's transportation system will consume a majority of the anticipated traditional revenues – approximately 90 percent.

Figure 16.1: Traditional Funding Allocation of Construction and Maintenance in the 2034 LRTP



Traditional revenues are categorized into dedicated funding streams to encourage a balanced regional transportation system. The funding categories are summarized below:

Figure 16.2: Traditional Revenue Streams



Non-Traditional Revenues

Non-traditional revenues include local revenues (funds from localities), tolls, public-private partnerships, and special government earmarks.

For the 2034 LRTP, several localities have identified local funding for local transportation projects within their jurisdictions. Locally funded projects that are considered regionally significant are included in the LRTP and are not automatically subject to prioritization. In other words, if localities can identify local funding for regionally significant projects, the projects will automatically be included in the LRTP. A list of these projects can be found in Chapter 18.

Table 16.1: Non-Traditional Revenue Streams

Locality	Local Funds for 2034 LRTP (2012-2034)
Virginia Beach	$1,136 Million
Suffolk	$153 Million
Portsmouth	$23 Million
Norfolk	$6 Million
Total	$1,318 Million

In addition to local governments contributing local revenues to fund transportation projects, the Virginia Port Authority has identified assist in the construction of the Craney Island Connector, a project that will benefit the port and enhance the movement of freight in the region.

Other non-traditional sources identified to fund construction projects in the plan include tolls and public-private partnerships (P3). Projects with associated tolls and P3 funds include:

- Downtown Tunnel/Midtown Tunnel/MLK Extension
- Dominion Boulevard
- US Route 460

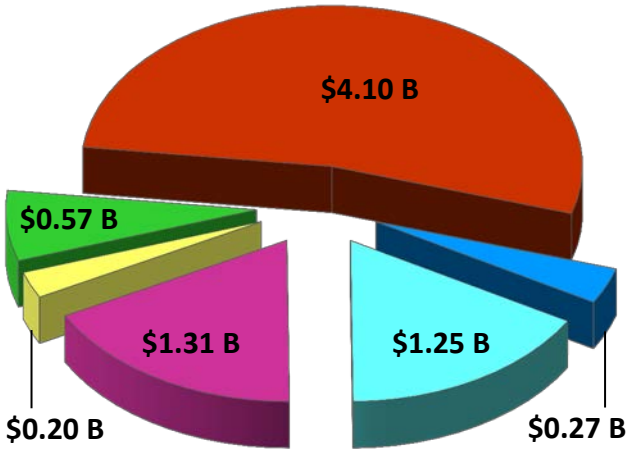
Governor's Omnibus Transportation Funding Package

To address the transportation funding shortfall, the Governor identified additional funding that would inject another $573 million into the region over the next several years for certain transportation projects. In addition, the Governor's Omnibus Transportation Funding Package identifies another $1.5 billion for four statewide Public-Private Partnership projects, including two in Hampton Roads: Downtown Tunnel/Midtown Tunnel/MLK Extension and US Route 460[1].

Total Revenues for the 2034 LRTP

In summary, combining traditional revenue sources, local revenues, projected tolling and private investment, and the Governor's Omnibus Transportation Funding Package, Hampton Roads can expect more than $7 billion in the next 20 years (2012-2034) to invest in new transportation projects for the 2034 LRTP.

Figure 16.3: Total Anticipated Revenue Stream for the 2034 LRTP



Sources of Estimated Revenues (2012-2034)

Traditional (Federal and State) Funding for Construction	$1.25 B
Local Funding	$1.31 B
Virginia Port Authority Contribution	$0.20 B
Governor's Omnibus Transportation Funding Package	$0.57 B
Public-Private Partnerships (P3)	$4.10 B
Private Tolls	$0.27 B
Total Revenues for New Construction Projects	**$7.70 B**

[1] The other P3s being considered in Virginia are the Coalfields Expressway in Southwest Virginia, and the I-95/395 HOT Lanes in Northern Virginia.

Selecting Projects

After identifying and estimating funding streams and accounting for regional maintenance needs, the next steps in the process are to identify funds allocated to committed projects (projects under construction or slated for construction), evaluate and prioritize projects, and draft a recommended list of projects and studies for the HRTPO Board to consider.

Figure 17.1: Process for developing the 2034 Fiscally-Constrained List of Projects and Studies

Candidate Projects

The list of 150 candidate transportation projects for the 2034 LRTP was determined by both technical staff and citizen input. The candidate projects, totaling approximately $30 billion include: increasing roadway capacity, expanding bridges and tunnels, replacing aging infrastructure, improving public transportation options, and enhancing the movement of freight in and out of the region.

Table 17.1: Summary of the 2034 LRTP Candidate Transportation Projects

Project Category	Number of Projects	Estimated Construction Cost*
Highways	113	$9.4 Billion
Highway Interchanges/ Intersections	15	$1.2 Billion
Bridges and Tunnels	14	$13.4 Billion
Transit	5	$2.2 Billion
Intermodal	3	$0.7 Billion
Total	**150**	**$26.9 Billion**

*Cost estimates in Year-of-Expenditure dollars

With an estimated total construction cost of approximately $30 billion and just over $7 billion identified to fund construction, HRTPO staff had the challenging task of evaluating and prioritizing these 150 candidate transportation projects. To narrow the list, staff first accounted for those projects automatically included in the plan (committed projects). Next, the Project Prioritization Tool was applied to the remaining projects to help evaluate and rank projects based on their

technical merits and regional benefits. High-ranking projects were then selected based on funding sources available.

Committed Projects

Committed Projects are fully funded transportation projects currently programmed in VDOT's Fiscal Year 2011-2016 SYIP. Furthermore, these projects either are under construction or scheduled for construction in the near future. As such, these projects are not subject to the Project Prioritization Tool and are automatically included in the LRTP.

Committed Projects include building new interstate highway, improving interstate interchanges, widening roadways, replacing bridges, purchasing rights-of-way, and bringing passenger rail service from Richmond to Norfolk. The total estimated cost of Committed Projects is approximately $250 million.

Application of Project Prioritization Tool

HRTPO staff conducted a thorough analysis of the 150 proposed candidate regional transportation projects. Projects were categorized into the following evaluation categories:

- Highways
- Bridges and Tunnels
- Transit
- Intermodal

Within each category, projects were further subcategorized into their roadway system classification (interstate, primary, secondary) for the funding purposes.

Figure 17.2: Project Prioritization 'Bridge and Tunnel' Weighting Factors

"Bridge and Tunnel" Weighting Factors	
Criteria and *Subcriteria*	**Weighting**
PROJECT UTILITY	
Congestion Level:	**30**
% Reduction in Existing and Future V/C Ratios	*10*
Existing V/C Ratio	*10*
Impact to Nearby Roadways	*10*
Infrastructure Condition (Bridge Sufficiency, Tunnel Condition,	**20**
How Old is the Tunnel in the Horizon Year (Tunnels Only)	*6.5*
Age of last major repair in the Horizon Year (Tunnels Only)	*6.75*
Cost for Necessary Repairs (Tunnels Only)	*6.75*
System Continuity and Connectivity	**10**
Safety and Security:	**10**
Critical Crash Ratio	*4.5*
Improvements to Incident Management or Evacuation Routes	*3*
Failure Impact (Impact of Detour to Alternate Crossing)	*2.5*
Cost Effectiveness (Cost/VMT)	**15**
Land Use/Future Development Compatibility	**10**
Modal Enhancements:	**5**
Enhances Other Categories	*1.5*
Improves Vehicular Access	*2*
Provides Continuous Maritime Crossing	*1.5*
PROJECT UTILITY TOTAL	***100***
ECONOMIC VITALITY	
Total Reduction in Travel Time	**30**
Labor Market Access:	**20**
Increases Travel Time Reliability	*10*
Increases Access for Major Employment Centers	*10*
Addresses the Needs of Basic Sector Industries:	**30**
Increases Access to Tourist Destinations	*10*
Increases Access for Defense Installations	*6*
Increases Access for Defense Installations – STRAHNET	*4*
Increases Access to Port Facilities	*10*
Increases Opportunity:	**20**
Provides New or Increased Access	*10*
Supports Plans for Future Growth	*10*
ECONOMIC VITALITY TOTAL	***100***
PROJECT VIABILITY	
Funding	**50**
Percentage of Funding Committed	*50*
Process/Project Readiness	**50**
Prior Commitment (is project in LRTP)	*10*
Percentage of Project Design Complete	*10*
Environmental Documents Complete	*15*
Environmental Decisions Obtained	*5*
ROW Obtained and Utilities Coordinated	*5*
Additional Environmental Permits Obtained	*5*
PROJECT VIABILITY TOTAL	***100***

Criteria in the Project Utility, Project Vitality, and Project Viability components were assigned weighting factors based on regional importance. These factors were determined with input from both technical and public stakeholders.

Data was collected on each project for analysis. Data encompassed the project's utility attributes (volume, crashes, cost effectiveness, etc.), economic vitality characteristics (travel time, labor market access, etc.), and viability considerations (funding commitment, project readiness, etc.). Related cost information on projects were converted to year-of-expenditure (YOE) dollars, based on when the project was anticipated to be operational[1]. Upon evaluation, projects were listed and ranked based on their composite score (sum of Project Utility, Economic Vitality, and Project Viability scores).

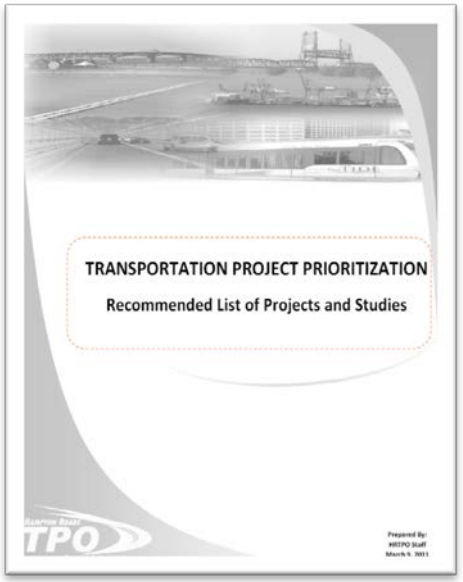
For more information regarding Project Prioritization scores, please refer to the *Prioritization of Transportation Projects: Project Evaluation and Scoring* report (December 2010).

Recommendation to the Board

Using the scores produced by the Project Prioritization Tool, recommendations from the HRTPO Transportation Technical Advisory Committee, the Governor's Omnibus Transportation Funding Package, and with consideration from stakeholder input (local, State, Federal, private sector, and public), the HRTPO staff developed a fiscally-constrained list of recommended regional transportation priorities for Hampton Roads.

This recommendation identified funding for approximately fifty projects and studies for the 2034 LRTP. These projects range from widening roadways to relieve congestion including I-64 on the Peninsula, replacing and repairing critical bridges, improving interchanges and intersections, reinstating and enhancing passenger rail service, developing passenger rail stations, and adding new roadways for increased connectivity such as the I-564 Intermodal Connector as well as adding another tube to the Midtown Tunnel.

The recommendation also included several studies that will evaluate the benefits and impacts of major regional projects such as the widening the Hampton Roads Bridge Tunnel and I-64 from Hampton Roads to Richmond, U.S. Route 460, Patriots Crossing, Southeastern Parkway and Greenbelt, High-Speed and Intercity Passenger Rail, and the Virginia Beach Transit Extension.



[1] Midpoint Inflation Factors based on estimated YOE Time Bands were utilized in YOE conversion. See Appendix F for more information.

Final Selection of 2034 LRTP Projects

On March 17, 2011, the HRTPO Board unanimously approved the fiscally-constrained prioritized list of projects and studies to include in the 2034 LRTP. This action was the culmination of an unprecedented 18 months of focused dialogue and regional cooperation to develop and approve an objective analysis of critically needed transportation improvements. Furthermore, it marked the first time a formalized process for prioritizing transportation projects was used as input to rank regionally significant projects in Hampton Roads.

On April 21, 2011, the HRTPO Board updated the list of projects and studies to reflect the P3 proposals received for the U.S. Route 460 project; moving the project from 'Studies' to 'Construction.'

On June 16, 2011, the HRTPO Board approved the final list of projects and studies for the 2034 LRTP, which now included locally-funded regional transportation projects.

Components of 2034 LRTP Projects

A listing of the projects as well as associated funding can be found in the next chapter.

Studies

Several transportation studies from the current 2030 LRTP, already underway, were also included in the 2034 LRTP. The combined estimated cost for these studies is approximately $34 million.

Regionally Funded Construction Projects

Regional projects that add capacity to the transportation network must be included in the LRTP. These projects are prioritized by roadway system (Interstate, Primary, Secondary, and Urban) within each Prioritization Category. The estimated total cost for new construction projects is approximately $5.9 billion (includes candidate projects from the Governor's Transportation Funding Proposal).

Locally Funded Regional Construction Projects

In addition to the regional prioritized projects approved by the HRTPO Board, several localities allocated local funding to regionally significant projects. Since these projects add capacity to the regional network, they are also included in the 2034 LRTP. The total estimated cost for locally funded new construction projects is $1.4 billion.

Unfunded Projects for Future Consideration

Besides the fiscally-constrained list of projects, the HRTPO staff and the Transportation Technical Advisory Committee developed a list of regional priority projects for future consideration should additional transportation funds be made available for the Hampton Roads region. The projects on this list are interstate projects for which there is no current funding source identified. The total estimated cost of unfunded interstate priorities is approximately $2 billion.

Summary of Projects and Studies

Figure 17.3 depicts the Committed Projects, Recommended Prioritized Projects and Studies, and Projects for Future Consideration as well as associated costs.

Demonstrating Fiscal Constraint

For the 2034 LRTP, the costs associated with Committed Projects, Studies, Regionally Funded Construction Costs, and Locally Funded Regional Construction Projects are less than or equal to expected funding (as seen in table below); therefore, fiscal constraint is demonstrated.

Project level fund sources are detailed in Chapter 18.

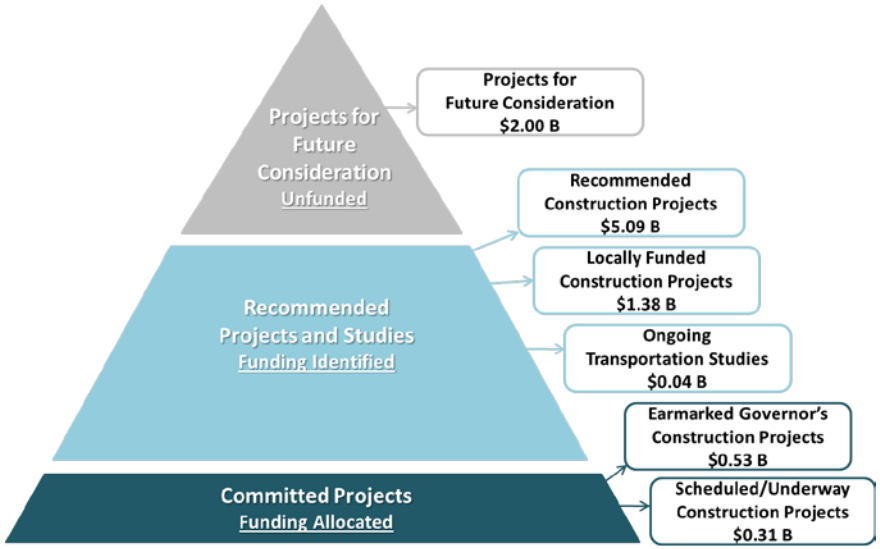


Figure 17.3: 2034 LRTP Project Funding Summary

Table 17.2: Fiscal Constraint Summary FY 2012-2034 ($Millions)

	Committed Projects	Recommended Studies	Recommended Projects	Fund Balance
Interstate	$127	$7	$193	$0
Primary	$19	$7	$21	$45
Secondary	$1	$4	$0	$12
Urban	$136	$0	$7	$0
Dedicated Statewide Funds	$1	$0	$78	$1
Regional Surface Transportation Program	$10	$16	$425	$151
Local/Agency Designated Funding	$18	$1	$1,380	$119
Private Tolls	$0	$0	$273	$0
Governor's Package	$21	$0	$510	$0
Public-Private Partnerships (P3)	$0	$0	$4,100	$0
TOTAL	$333	$35	$6,987	$328

Figure 17.4: Traditional Funding Allocation Summary

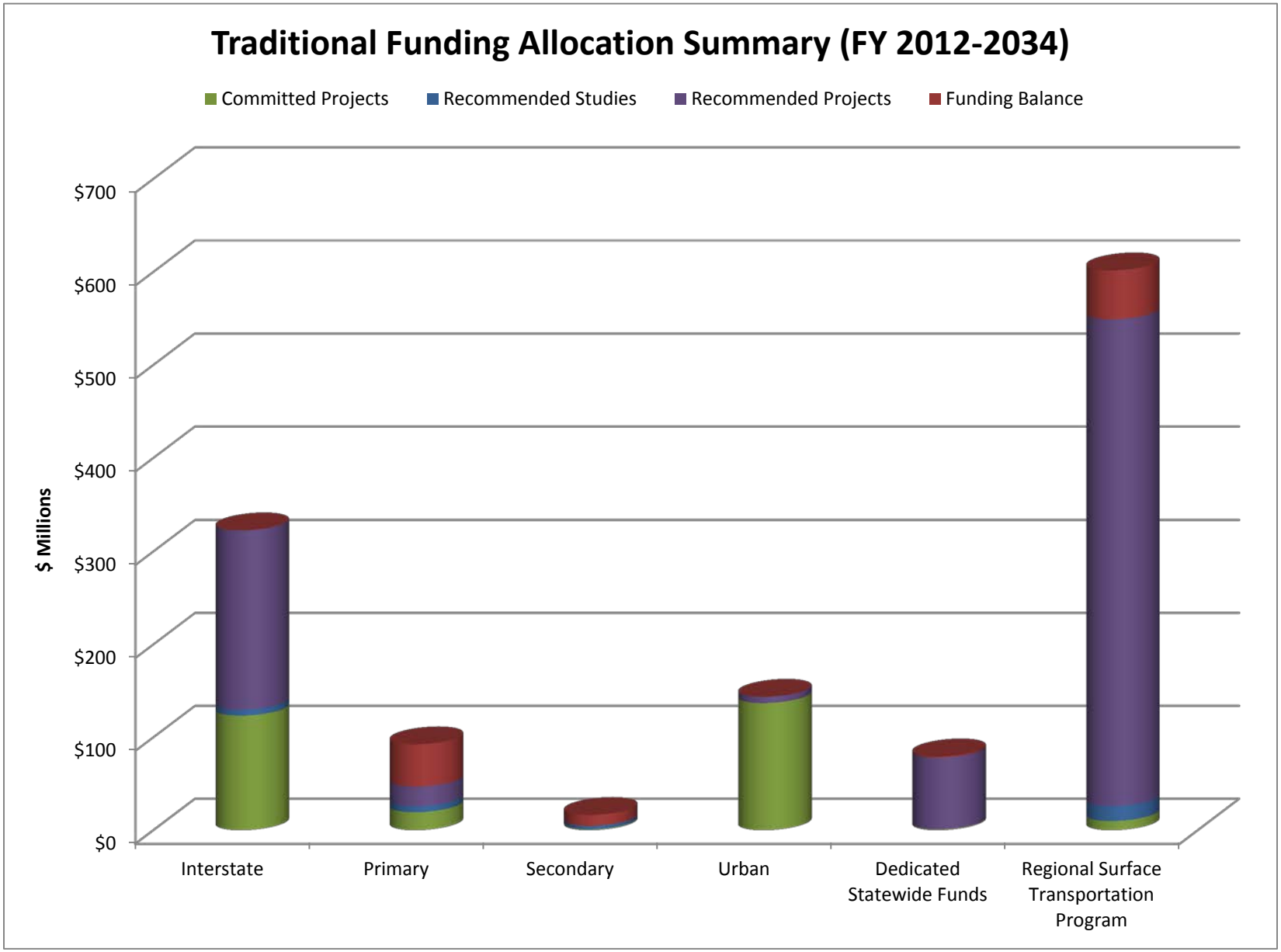
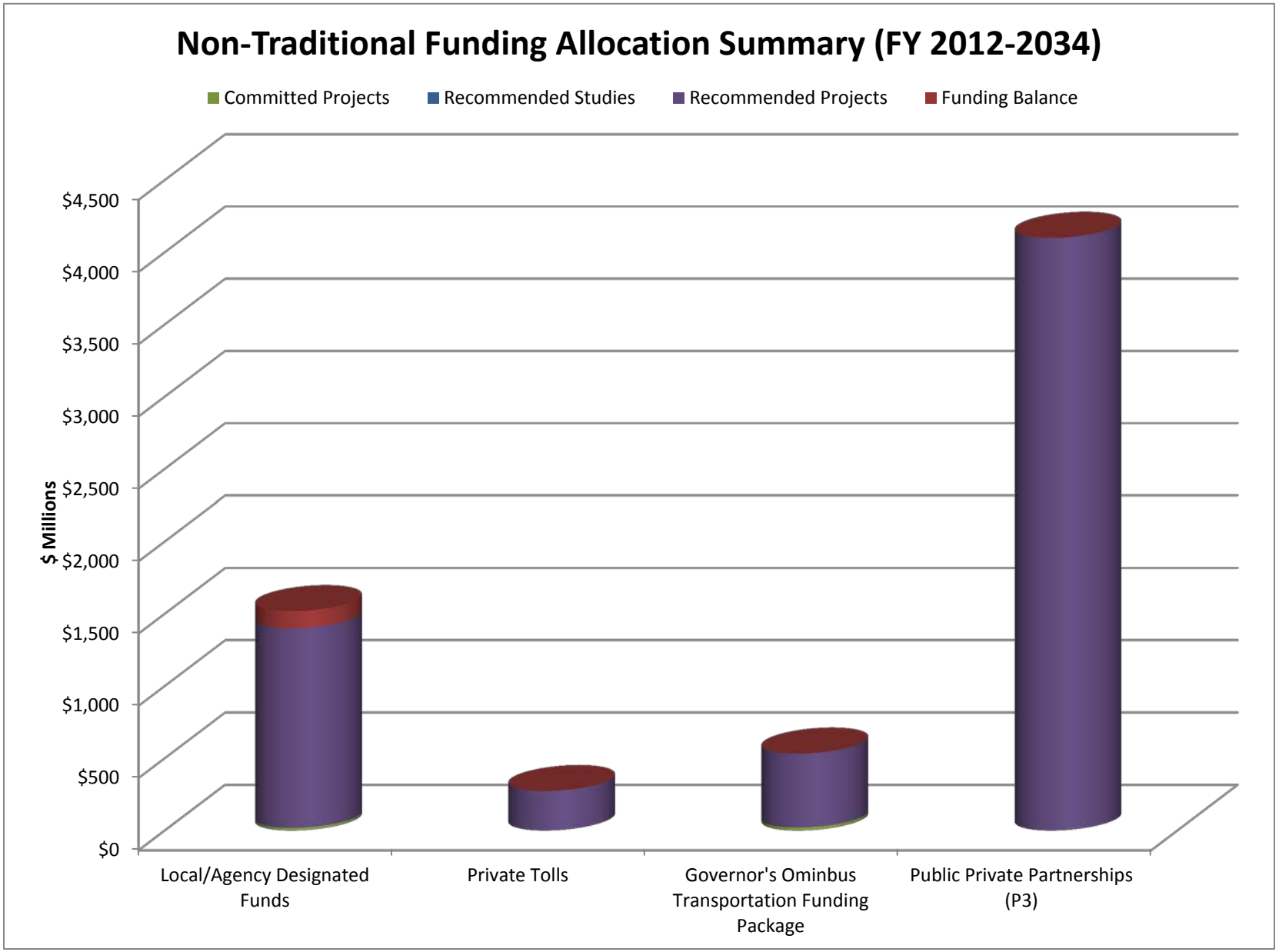


Figure 17.5: Non-Traditional Funding Allocation Summary



Travel Demand Model

An important analysis tool in transportation planning is the travel demand model. The travel demand model is a computer program designed to simulate travel. The model uses socioeconomic data (households, population, auto ownership, workers, and employment) to estimate traffic volumes and patterns in an effort to identify current and future deficiencies in the transportation network.

Trip Generation	•How Many Trips?
Trip Distribution	•Where Will They Go?
Mode Choice	•How Will They Get There?
Trip Assignment	•What Route Will They Take?

Traditional travel demand models use a four-step process:
Trip Generation produces estimates of trip productions (origins) and trip attractions (destinations) by trip purpose (going to work, school, shopping, etc.). Trip Distribution determines where the trips are traveling to and from. Mode Choice decides by what mode the trips will be made (car, bus, light rail, carpool, etc.). Finally, Trip Assignment determines the best route the vehicle trips will take.

Results from the travel demand model are used in the Project Prioritization Tool and the LRTP to help identify where transportation improvements are needed within the region.

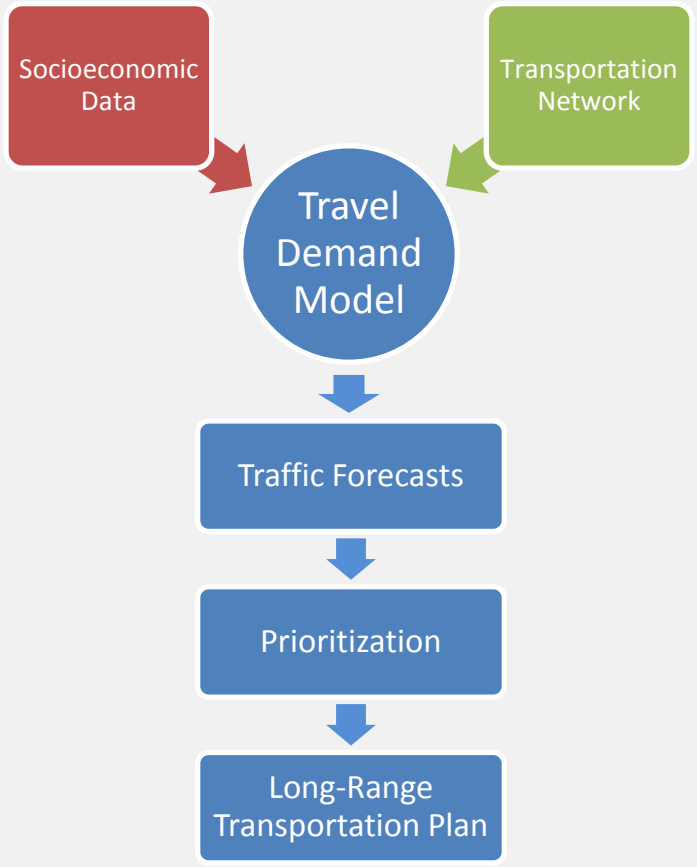
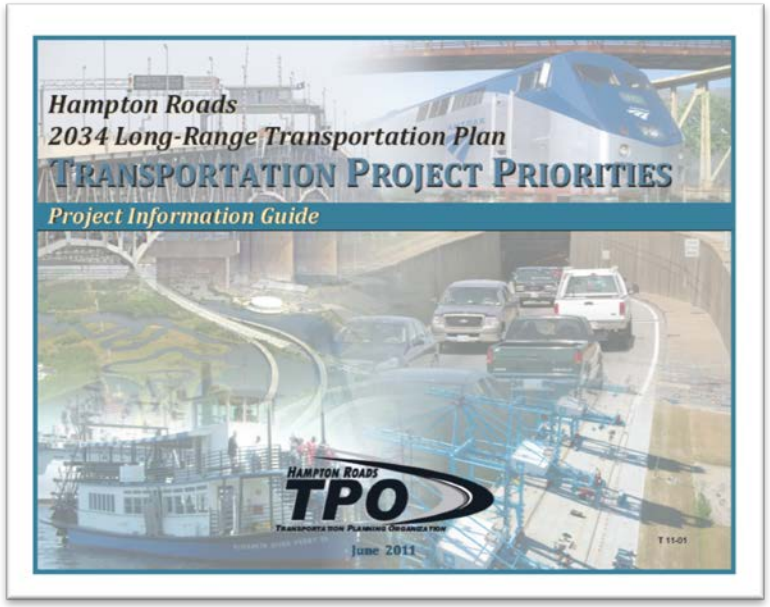


Figure 17.6: Travel Demand Model Incorporation into the LRTP

The 2034 LRTP Projects

The 2034 LRTP is comprised of approximately 90 studies and construction projects. The total cost for these projects is estimated at $7 billion.

For more detailed information about any one of the projects listed in the following tables, please refer to the 2034 LRTP Transportation Project Priorities Project Information Guide (also located in Appendix G).



Studies

Figure 18.1: 2034 LRTP Ongoing Transportation Studies

- I-64 Peninsula Corridor*
- Patriots Crossing
- Hampton Roads Bridge Tunnel
- Southeastern Parkway and Greenbelt
- High-Speed and Intercity Passenger Rail
- Virginia Beach Transit Extension
- Route 60 Relocation
- Skiffes Creek Connector
- Croaker Road
- Longhill Road
- Air Terminal Interchange

Note: List of studies not in a prioritized order
**Indicates the project is included as a candidate project in the Governor's Omnibus Transportation Funding Package*

Committed Construction Projects in the 2034 LRTP

Project	Locality
Conventional Passenger Rail Service (Norfolk to Richmond/Northeast Corridor)	Multi
Gilmerton Bridge (0.36 mi E. of Bridge (Bainbridge Blvd) to 0.42 mi W. of Bridge (Shell Rd)	Chesapeake
South Norfolk Jordan Bridge (Truxton St to Veneer Rd)*	Chesapeake
Portsmouth Blvd (Jolliff Rd to Suffolk CL)	Chesapeake
Bridge Street Bridge (Rudd Ln to Marrow St)	Hampton
Commander Shepard Blvd (Phase II) (Big Bethel Rd to N. Campus Pkwy)	Hampton
I-64 Interchange at Lasalle Ave	Hampton
Saunders Rd (Big Bethel Rd to Newport News CL)	Hampton
Wythe Creek Rd (Alphus St to Commander Shepard Blvd)	Hampton/Poquoson
Ironbound Rd (0.07 mi S. of Longhill Connector Rd (Schmidt Rd) to 0.01 mi. S. of Strawberry Plains Rd)	James City County
Denbigh Blvd Bridge Replacement (Richneck Rd to Trailblazer Blvd)	Newport News
Fort Eustis Blvd (0.44 mi. E of Jefferson Ave (Cherry Creek Dr) to 0.01 mi W of George Washington Memorial Hwy (Rte 17))	Newport News/York County
Fort Eustis Blvd Bridge Replacement (I-64 to Lee Hall Reservoir)	Newport News
Huntington Ave Bridge Replacement (39th St to 41st St)	Newport News
Middle Ground Blvd (Jefferson Ave to Warwick Blvd)	Newport News
Washington Ave Bridge Replacement (39th St to 41st St)	Newport News
Hampton Blvd Railroad Grade Separation (Rogers Ave to B Ave)	Norfolk
I-64 Interchange at Norview Ave	Norfolk
I-564 Intermodal Connector (I-564 to Norfolk Naval Base/NIT/Chambers Field (Hampton Blvd))	Norfolk
Military Hwy (Robin Hood Rd to 0.3 mile north of Northampton Blvd)	Norfolk
Military Hwy (Lowery Rd to 0.3 mile south of Northampton Blvd)	Norfolk
Wesleyan Dr (Northampton Blvd to Baker Rd) (NOR/VB segments)	Norfolk/Virginia Beach
Turnpike Rd (0.13 mi E. of Frederick Blvd to Constitution Ave)	Portsmouth
Nansemond Pkwy (Chesapeake CL to NS Railroad)	Suffolk
I-264 Interchange at London Bridge Rd	Virginia Beach
Kempsville Rd Intersection at Princess Anne Rd	Virginia Beach
Nimmo Pkwy (Holland Rd to General Booth Blvd)	Virginia Beach
Princess Anne Rd and Nimmo Pkwy (Dam Neck Rd to Holland Rd)	Virginia Beach
Witchduck Rd (Bonney Rd to Grayson Rd)	Virginia Beach

Source: FY 2011-2016 Six-Year Improvement Program.

Table 18.1: Committed Projects in the 2034 LRTP

Regionally Funded Construction Projects in the 2034 LRTP

Prioritization Category	Roadway Systems include Interstate, Primary, Urban. Funding is allocated according to roadway system.	Locality	Rank in Roadway System	Prioritization Scores
Bridge & Tunnel Projects	**Primary Roadway System**			
	Downtown Tunnel/Midtown Tunnel/MLK Extension* (Hampton Blvd to I-264)	Norfolk/Portsmouth	1	**242**
	Dominion Blvd* (0.05mi N. of Great Bridge Blvd to 0.75mi S. of Cedar Rd)	Chesapeake	2	**221**
	Urban Roadway System			
	Lesner Bridge* (E. Stratford Rd to Page Ave)	Virginia Beach	1	**173**
Highway Projects	**Interstate Roadway System**			
	I-64 Peninsula Widening (Jefferson Ave (exit 255) and Ft Eustis Blvd (exit 250))	Newport News	1	**178**
	Primary Roadway System			
	Route 17 (George Washington Memorial Hwy) (1.27mi S. of Lakeside Dr. (Hampton Hwy) to 1.52mi N. of Lakeside Dr. (Dare Rd))*	York County	1	**202**
	Route 460 (Hampton Roads portion) (Bowers Hill to Zuni)	Suffolk/Isle of Wight	2	**187**
	Route 17 (George Washington Memorial Hwy) (1.52mi N. of Lakeside Dr. (Dare Rd) to Denbigh Blvd)	York County	4	**146**
	Urban Roadway System			
	Lynnhaven Pkwy (Indian River Rd to Centerville Tnpk)*	Virginia Beach	1	**191**
	Route 58 (Holland Rd) (Suffolk Bypass to 0.7mi W. of Manning Bridge Rd)	Suffolk	2	**180**
	Military Hwy at Northampton Blvd Continuous Flow Interchange	Norfolk	6	**157**
	Holland Rd (Nimmo Pkwy to Dam Neck Rd)*	Virginia Beach	10	**141**
	Witchduck Rd (I-264 to Virginia Beach Blvd)*	Virginia Beach	11	**141**
	Laskin Rd (Republic Rd to Oriole Dr)*	Virginia Beach	21	**114**
	Indian River Rd (Lynnhaven Pkwy to Elbow Rd)*	Virginia Beach	23	**109**
	Atkinson Blvd (Jefferson Ave to Warwick Blvd)	Newport News	24	**107**
	Laskin Rd (Oriole Dr to 30th/31st St)*	Virginia Beach	31	**100**
	Elbow Rd/Dam Neck Rd (Indian River Rd to VA Beach Amphitheater)*	Virginia Beach	35	**98**

Table 18.2: Regionally Funded Construction Projects in the 2034 LRTP

Regionally Funded Construction Projects in the 2034 LRTP (Continued)

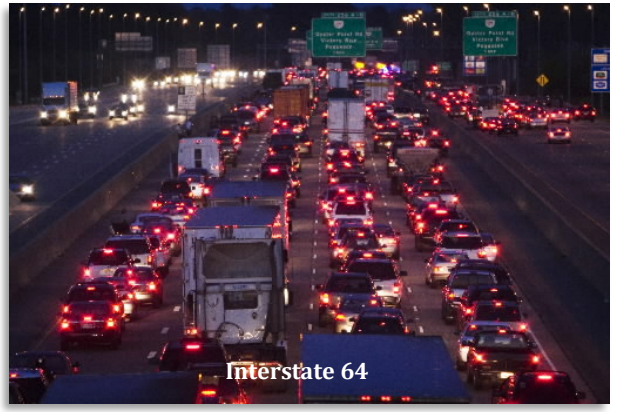
Intermodal Transportation Projects	**Urban Roadway System**			
	Craney Island Connector (VA-164 to Craney Island Marine Terminal (Future))	Portsmouth	1	**189**
Transit	WATA Administrative Operations Center	James City County	N/A	N/A
Passenger Rail	Newport News Multimodal High-Speed and Intercity Passenger Rail Stations Development	Newport News	N/A	N/A

* Indicates the project is included as a candidate project in the Governor's Transportation Funding Proposal. N/A - Not evaluated in Prioritization Analysis

Table 18.2: Regionally Funded Construction Projects in the 2034 LRTP (Continued)


Gilmerton Bridge


Downtown Tunnel/Midtown Tunnel/MLK Extension


Interstate 64

Locally Funded Regional Construction Projects in the 2034 LRTP

Prioritization Category	Roadway Systems include Interstate, Primary, Urban. Funding is allocated according to roadway system.	Locality	Rank in Roadway System	Prioritization Scores
Bridge & Tunnel Projects	**Urban Roadway System**			
	Mills Godwin Bridge (Bridge Road)	Suffolk	3	**150**
	High Street (Churchland Bridge)	Portsmouth	6	**132**
Highway Projects	**Urban Roadway System**			
	Seaboard Rd (Princess Anne to Nimmo Pkwy)	Virginia Beach	7	**155**
	Bridge Road (Godwin Br to Chesapeake City Line)	Suffolk	8	**154**
	Dam Neck Rd (Holland Rd to Drakesmile Rd)	Virginia Beach	19	**114**
	Holland Rd (Rosemont Rd to Independence Blvd)	Virginia Beach	20	**114**
	Dam Neck Rd (Drakesmile Rd to London Bridge Rd)	Virginia Beach	22	**109**
	Indian River Rd (Centerville Tnpk to Ferrell Pkwy)	Virginia Beach	26	**104**
	First Colonial Rd (Old Donation Pkwy to Virginia Beach Blvd)	Virginia Beach	28	**103**
	Newtown Rd (Baker Rd to Virginia Beach Blvd)	Virginia Beach	32	**100**
	West Neck Pkwy Ext'd (Elbow Rd to N. Landing Rd)	Virginia Beach	36	**98**
	Centerville Tnpk (Indian River Rd to Kempsville Rd)	Virginia Beach	39	**97**
	Rosemont Rd (Virginia Beach Blvd to Holland Rd)	Virginia Beach	40	**96**
	Providence Rd (Kempsville Rd to Princess Anne Rd)	Virginia Beach	44	**92**
	Centerville Tnpk (Kempsville Rd to Chesapeake CL)	Virginia Beach	45	**90**
	General Booth Blvd (Oceana Blvd to Dam Neck Rd)	Virginia Beach	52	**86**
	Ferrell Pkwy (Indian River Rd to Indian Lakes Blvd)	Virginia Beach	57	**82**

Table 18.3: Locally Funded Construction Projects in the 2034 LRTP

Locally Funded Regional Construction Projects in the 2034 LRTP (Continued)

Highway Projects	**Urban Roadway System**			
	Lynnhaven Pkwy (Holland Rd to Princess Anne Rd)	Virginia Beach	59	**82**
	Ferrell Pkwy (Indian Lakes to Pleasant Valley Rd)	Virginia Beach	60	**81**
	Nimmo Pkwy (Indian River Rd & N. Landing Rd to West Neck Pkwy Ext'd)	Virginia Beach	63	**74**
	Princess Anne Rd (Upton Dr to General Booth Blvd)	Virginia Beach	67	**70**
	London Bridge Rd (Dam Neck Rd to Shipps Corner Rd)	Virginia Beach	76	**66**
	Birdneck Rd (I-264 to Virginia Beach Blvd)	Virginia Beach	85	**59**
	Cleveland St (Witchduck Rd to Clearfield Ave)	Virginia Beach	86	**59**
	Kempsville Rd Intersection at Indian River Rd	Virginia Beach	N/A	N/A
	First Colonial Rd Intersection at Virginia Beach Blvd	Virginia Beach	N/A	N/A
	Shore Dr (Marlin Bay Dr to E. Stratford Rd (bridge approach))	Virginia Beach	N/A	N/A
	Shore Dr (Page Ave to Great Neck Rd)	Virginia Beach	N/A	N/A
	Shore Dr (Pleasure House Rd to Treasure Island Dr)	Virginia Beach	N/A	N/A
Passenger Rail	Harbor Park Multimodal High-Speed and Intercity Passenger Rail Station Development	Norfolk	N/A	N/A

* Indicates the project is included as a candidate project in the Governor's Transportation Funding Proposal.

N/A - Not evaluated in Prioritization Analysis

Table 18.3: Locally Funded Construction Projects in the 2034 LRTP (Continued)

Map 18.1: 2034 LRTP Projects

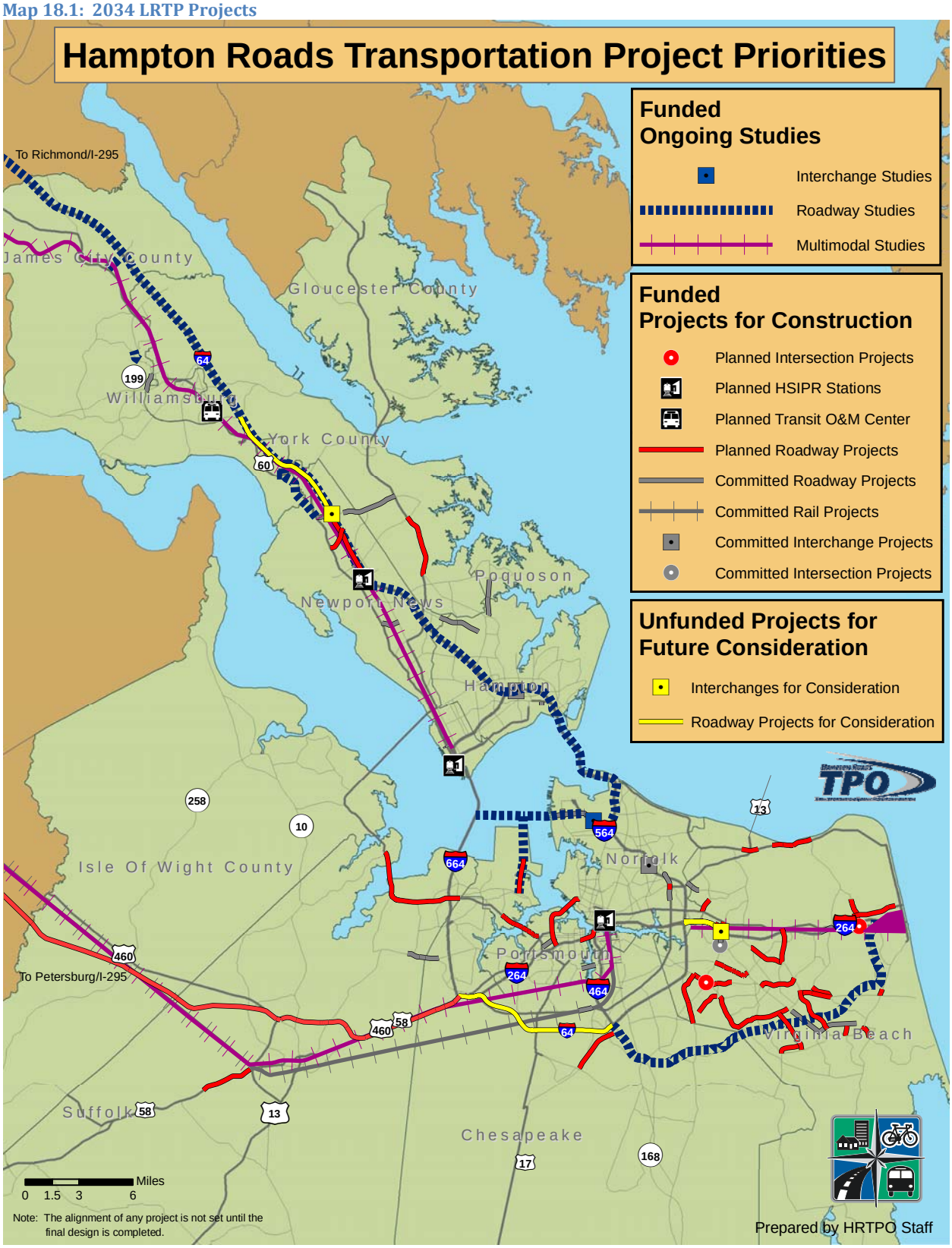


Table 18.4: Source of Project Funds (in Millions) – FY 2012-2034

	Locality	Project	YOE[1] Completion Cost (FY 12-34)	Estimated YOE Time Band[2]	Dedicated Statewide Funds (DSF)	Regional Surface Transportation Program (RSTP)	Interstate	Primary	Secondary	Urban	Local/ Agency	Governors Omnibus Bill	Private Tolls	Total Funding (FY12-34)
STUDIES	Multi	Hampton Roads Bridge-Tunnel Study	$1.6	2012-2018				$1.6						$1.6
	Multi	Patriots Crossing Study[3]	$0.0	2012-2018										$0.0
	Multi	I-64 Peninsula Corridor Study	$3.0	2012-2018			$3.0							$3.0
	CH/VB	Southeastern Parkway and Greenbelt Study	$1.0	2012-2018							$1.0			$1.0
	JCC	Croaker Road Study	$1.0	2012-2018					$1.0					$1.0
	JCC	Longhill Road Study	$2.8	2012-2018					$2.8					$2.8
	JCC/NN	Route 60 Relocated Study	$4.0	2018-2018				$4.0						$4.0
	JCC	Skiffes Creek Connector Study	$1.0	2012-2018				$1.0						$1.0
	NO	Air Terminal Interchange Study	$3.5	2018-2018			$3.5							$3.5
	Multi	High-Speed and Intercity Passenger Rail Study	$10.0	2012-2018		$10.0								$10.0
	VB	Virginia Beach Transit Extension Study	$6.0	2012-2018		$6.0								$6.0
COMMITTED PROJECTS	Multi	Conventional Passenger Rail Service	$14.8	2012-2018							$14.8			$14.8
	CH	Gilmerton Bridge Replacement	$57.0	2012-2018	$0.7					$44.8		$11.6		$57.1
	CH	South Norfolk Jordan Bridge[4]	N/A	2012-2018										N/A
	CH	Portsmouth Blvd[3]	$0.0	2012-2018										$0.0
	HM	Bridge Street Bridge	$1.4	2012-2018						$1.3		$0.1		$1.4
	HM	Commander Shepard Blvd (Phase II)[3]	$0.0	2012-2018										$0.0
	HM	I-64 Intchg at LaSalle Ave[3]	$0.0	2012-2018										$0.0
	HM	Saunders Rd[3]	$0.0	2012-2018										$0.0
	HM/POQ	Wythe Creek Rd	$9.8	2012-2018		$9.8								$9.8
	JCC	Ironbound Rd	$0.8	2012-2018					$0.8					$0.8
	NN	Denbigh Blvd Bridge Replacement	$30.3	2012-2018			$30.3							$30.3
	NN	Fort Eustis Blvd[3]	$0.0	2012-2018										$0.0
	NN	Ft. Eustis Blvd Bridge Replacement[3]	$0.0	2012-2018										$0.0
	NN	Huntington Ave Bridge Replacement[3]	$0.0	2012-2018										$0.0
	NN	Middle Ground Blvd	$41.8	2012-2018						$40.2		$1.6		$41.8
	NN	Washington Ave Bridge Replacement	$1.0	2012-2018						$1.0				$1.0
	NOR	Hampton Blvd RR Grade Separation	$20.1	2012-2018				$19.3				$0.8		$20.1
	NOR	I-64 Intchg at Norview Ave[5]	$5.3	2012-2018			$5.1					$0.2		$5.3
	NOR	I-564 Intermodal Connector	$98.5	2012-2018			$91.6					$6.9		$98.5
	NOR	Military Hwy	$17.9	2012-2018						$17.7		$0.2		$17.9
	NOR/VB	Wesleyan Dr	$1.8	2012-2018						$1.8				$1.8

Table 18.4: Source of Project Funds (in Millions) – FY 2012-2034 (Continued)

	Locality	Project	YOE[1] Completion Cost (FY 12-34)	Estimated YOE Time Band[2]	Dedicated Statewide Funds (DSF)	Regional Surface Transportation Program (RSTP)	Interstate	Primary	Secondary	Urban	Local/ Agency	Governors Omnibus Bill	Private Tolls	Total Funding (FY12-34)
	POR	Turnpike Rd[3]	$0.0	2012-2018										$0.0
	SUF	Nansemond Pkwy	$2.6	2012-2018						$1.1	$1.5			$2.6
	VB	I-264 Intchg at London Bridge Rd[3]	$0.0	2012-2018										$0.0
	VB	Kempsville Rd Intersection at Princess Anne Rd	$1.7	2012-2018							$1.7			$1.7
	VB	Nimmo Pkwy	$28.3	2012-2018						$28.3				$28.3
	VB	Princess Anne Rd and Nimmo Pkwy[3]	$0.0	2012-2018										$0.0
	VB	Witchduck Rd[3]	$0.0	2012-2018										$0.0
CONSTRUCTION PROJECTS	NOR/POR	Downtown Tunnel/Midtown Tunnel/MLK Freeway Extension	**See Table 18.5**											
	CH	Dominion Blvd	$426.0	2012-2018								$153.1	$272.9	**$426.0**
	VB	Lesner Bridge	$89.0	2012-2018	$10.2							$78.8		**$89.0**
	Multi	I-64 Peninsula Widening (including Segment 1, 6-Lane Option)[6]	$260.1	2029-2034	$67.3		$192.8							**$260.1**
	YK	Route 17 (George Washington Memorial Hwy)	$32.7	2012-2018				$13.2				$19.5		**$32.7**
	Multi	Route 460	**See Table 18.5**											
	Yk	Route 17 (George Washington Memorial Hwy)	$8.0	2019-2028				$8.0						**$8.0**
	VB	Lynnhaven Pkwy	$20.4	2012-2018		$2.9						$17.5		**$20.4**
	SUF	Route 58 (Holland Rd)	$75.0	2012-2018		$75.0								**$75.0**
	NOR	Military Hwy at Northampton Blvd Continuous Flow Interchange	$49.8	2012-2018		$49.8								**$49.8**
	VB	Holland Rd	$25.9	2012-2018								$25.9		**$25.9**
	VB	Witchduck Rd	$32.1	2012-2018		$2.9						$29.2		**$32.1**
	VB	Laskin Rd	$66.5	2012-2018								$66.5		**$66.5**
	VB	Indian River Rd	$73.4	2012-2018		$14.5						$58.9		**$73.4**
	NN	Atkinson Blvd	$10.0	2019-2028		$3.5				$6.5				**$10.0**
	VB	Laskin Rd	$23.1	2012-2018		$3.5						$19.6		**$23.1**
	VB	Elbow Rd/Dam Neck Rd	$49.4	2012-2018		$8.3						$41.1		**$49.4**
	POR	Craney Island Connector	$436.0	2012-2018		$236.0					$200.0			**$436.0**
	JCC	WATA Admin. Center	$9.0	2019-2028		$9.0								**$9.0**
	NN	Newport News Multimodal HSIPR Stations Development	$20.0	2012-2018		$20.0								**$20.0**
	SUF	Mills Godwin Bridge	$60.0	2019-2028							$60.0			**$60.0**
	POR	High Street (Churchland Bridge)	$23.0	2012-2018							$23.0			**$23.0**
	VB	Seaboard Rd	$8.7	2012-2018							$8.7			**$8.7**
	SUF	Bridge Road	$90.0	2012-2018							$90.0			**$90.0**
	VB	Dam Neck Rd	$34.8	2019-2028							$34.8			**$34.8**

Table 18.4: Source of Project Funds (in Millions) – FY 2012-2034 (Continued)

	Locality	Project	YOE[1] Completion Cost (FY 12-34)	Estimated YOE Time Band[2]	Dedicated Statewide Funds (DSF)	Regional Surface Transportation Program (RSTP)	Interstate	Primary	Secondary	Urban	Local/ Agency	Governors Omnibus Bill	Private Tolls	Total Funding (FY12-34)
CONSTRUCTION PROJECTS	VB	Holland Rd	$56.5	2019-2028							$56.5			**$56.5**
	VB	Dam Neck Rd	$48.9	2019-2028							$48.9			**$48.9**
	VB	Indian River Rd	$74.2	2019-2028							$74.2			**$74.2**
	VB	First Colonial Rd	$51.0	2012-2018							$51.0			**$51.0**
	VB	Newtown Rd	$23.5	2019-2028							$23.5			**$23.5**
	VB	West Neck Pkwy Ext'd	$49.1	2019-2028							$49.1			**$49.1**
	VB	Centerville Tnpk	$44.2	2012-2018							$44.2			**$44.2**
	VB	Rosemont Rd	$86.9	2019-2028							$86.9			**$86.9**
	VB	Providence Rd	$63.8	2019-2028							$63.8			**$63.8**
	VB	Centerville Tnpk	$28.6	2012-2018							$28.6			**$28.6**
	VB	General Booth Blvd	$37.4	2019-2028							$37.4			**$37.4**
	VB	Ferrell Pkwy	$33.2	2019-2028							$33.2			**$33.2**
	VB	Lynnhaven Pkwy	$92.7	2019-2028							$92.7			**$92.7**
	VB	Ferrell Pkwy	$42.3	2019-2028							$42.3			**$42.3**
	VB	Nimmo Pkwy	$41.1	2012-2018							$41.1			**$41.1**
	VB	Princess Anne Rd	$22.9	2012-2018							$22.9			**$22.9**
	VB	London Bridge Rd	$40.8	2019-2028							$40.8			**$40.8**
	VB	Birdneck Rd	$21.1	2019-2028							$21.1			**$21.1**
	VB	Cleveland St	$13.6	2012-2018							$13.6			**$13.6**
	VB	Kempsville Rd Int. at Indian River Rd	$11.6	2012-2018							$11.6			**$11.6**
	VB	First Colonial Rd Int. at Virginia Beach Blvd	$28.2	2012-2018							$28.2			**$28.2**
	VB	Shore Dr	$14.8	2012-2018							$14.8			**$14.8**
	VB	Shore Dr	$12.9	2012-2018							$12.9			**$12.9**
	VB	Shore Dr	$18.4	2019-2028							$18.4			**$18.4**
	NOR	Harbor Park Multimodal HSIPR Station Development	$6.0	2012-2018							$6.0			**$6.0**
		TOTAL	**$3,253.6**		**$78.2**	**$451.2**	**$326.3**	**$47.1**	**$4.6**	**$142.7**	**$1,399.2**	**$531.5**	**$272.9**	**$3,253.7**

[1] Year of Expenditure Dollars
[2] Midpoint inflation factor from each anticipated project opening time band applied to projects to convert to YOE (see Appendix F for more details).
[3] Projects fully funded prior to Fiscal Year 2012.
[4] South Norfolk Jordan Bridge is a privately funded transportation project.
[5] $3.7 Million of I-64 Interchange at Norview Avenue's Interstate funding allocation comes from the $12 billion LRTP maintenance budget.
[6] Includes Segment 1, 6-Lane Option, currently programmed and fully funded in FY 2014-2019 Six-Year Improvement Program for $100 million.

Table 18.5: Source of Public-Private Partnership Project Funds (in Millions) – FY 2012-2034

	Locality	Public-Private Partnership Project	YOE[1] Completion Cost (FY 12-34)	Estimated YOE Time Band[2]	State Commitment	TIFIA	Private Equity, Debt, and Revenue from Operations	Total Funding (FY12-34)
	NOR/POR	Downtown Tunnel/Midtown Tunnel/MLK Freeway Extension[3]	$2,100.0	2012-2018	$362.0	$422.0	$1,300.0	$2,100.0
	Multi	Route 460[4]	$2,000.0	2012-2018	$500.0		$1,500.0	$2,000.0

[1] Year of Expenditure Dollars

[2] Midpoint inflation factor from each anticipated project opening time band applied to projects to convert to YOE (see Appendix F for more details).

[3] Source: Office of the Governor, December 5, 2011

[4] Source: VDOT, August 2011

Downtown Tunnel/Midtown Tunnel/MLK Freeway Extension Project

Under Virginia's PPTA, VDOT has partnered with Elizabeth River Crossings (ERC) to move forward with construction on the Downtown Tunnel/Midtown Tunnel/Martin Luther King (MLK) Extension project. As of December 2, 2011, the value of the comprehensive agreement between VDOT and ERC is $2.1 billion[1]. This includes finance, design, construction, maintenance, and operations.

Key components of this project include:

- Doubling the capacity of the Midtown Tunnel by building an additional two-lane tunnel near the existing tunnel under the Elizabeth River
- Increasing transit service between Portsmouth and Norfolk
- Rehabilitating the existing Midtown Tunnel and both of the Downtown Tunnels
- Extending the MLK Freeway from London Boulevard to Interstate 264, with an interchange at High Street
- Modifying the interchange at Brambleton Avenue/Hampton Boulevard in Norfolk

Financing and tolls for this project include:

- VDOT's contribution (state commitment) is $362 million, specifically designated to lower the tolls
- ERC will provide 1.3 billion through equity, debt, and revenue from operations
- ERC will also secure $422 million in financing from the U.S. Department of Transportation's low interest TIFIA loan
- Project will be financed through tolls, initially ranging from $1.59 to $1.84 per car for the tunnels and $.50 for the MLK Freeway extension for tunnel users and $1 for non-tunnel users
- Tolls will be collected electronically using *E-ZPass*, eliminating the need for toll booths

[1] Office of the Governor, December 5, 2011

Route 460 Project

Route 460 remains a priority for the Commonwealth of Virginia. Private proposals for the project under Virginia's PPTA are currently under active development and review. As of July 2011, Phase Four of the PPTA procurement process was initiated through the issuance of the Request for Detailed Proposals[2].

The Governor has also committed public state funds to Route 460 as part of the Governor's 2011 Transportation Funding Plan. In this plan, the Governor identified $1.4 billion in public funds towards four statewide PPTA projects (Downtown Tunnel/Midtown Tunnel/MLK Extension, Route 460, Coalfields Expressway, and the I-95/395 HOT lanes). VDOT has committed to a public subsidy of $500 million for the design and construction of the project.

Based on correspondence received from FHWA on November 10, 2010 (see Appendix F), fiscal-constraint of a P3 project may be deemed "reasonable" if:

- There are clear expressions of support from the Governor
- There is State enabling legislation in place
- The State has had success in implementing P3 projects
- There is an interest in the project from the investment community

These tests of "reasonableness" have been satisfied for the Route 460 project:

- The Governor has expressed his support for the project
- Virginia has the Public-Private Transportation Act (PPTA) of 1995 in place
- PPTA projects like the Capital Beltway HOT Lanes and the Richmond Airport Connector have been successfully implemented
- The investment community has shown interest in the project as evidenced by the submission of three conceptual proposals with preliminary financial information that have passed VDOT's quality control review

Therefore, the Route 460 P3 project is included in the fiscally-constrained 2034 LRTP.

The Route 460 project extends across two MPOs (the HRTPO and Tri-Cities MPO). The $2.0 billion estimate is for the entire Route 460 corridor (Suffolk Bypass to I-295 in Prince George County); the Hampton Roads portion from Bowers Hill to Zuni is estimated to be $700 million. As this project moves forward, HRTPO staff will coordinate with the Tri-Cities MPO as necessary.

[2] VDOT, August 2011

Plan Performance

The 2034 LRTP was developed to meet measurable goals, especially in areas of congestion management, environmental preservation, and equal considerations for all transportation users.

Level of Congestion

One of the purposes of the 2034 LRTP is to reduce congestion levels in Hampton Roads. Using the region's travel demand model, HRTPO staff forecasted the vehicle volumes and level of congestion (level of service, or LOS) on roadways (arterial class and above) in Hampton Roads. See Appendix H for 2034 forecasts of volumes and congestion by roadwayy segment.

HRTPO staff analyzed the congested lane-miles for three different scenarios:

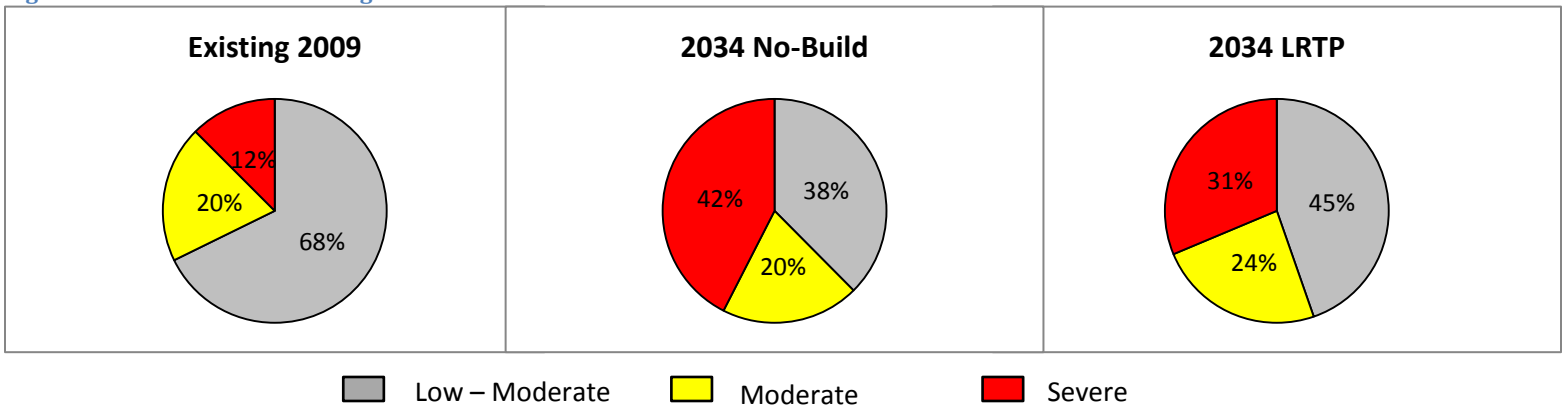
- Existing (2009)
- 2034 'No-Build' (do nothing)
- 2034 LRTP (projects identified in the 2034 LRTP)

In evaluating the results, congestion is expected to increase in 2034 largely due to the anticipated increase in regional population and employment. In comparing the 'build' and 'no-build' scenarios for 2034, results indicate that the portion of lane-miles with low to moderate congestion (LOS A through C) is expected to increase slightly by 7 percent, while the portion of lane-miles with severe congestion (LOS E through F) is expected to decrease by 11 percent. The portion of lane-miles with moderate congestion (LOS D) is expected to remain almost the same, increasing just four percent.

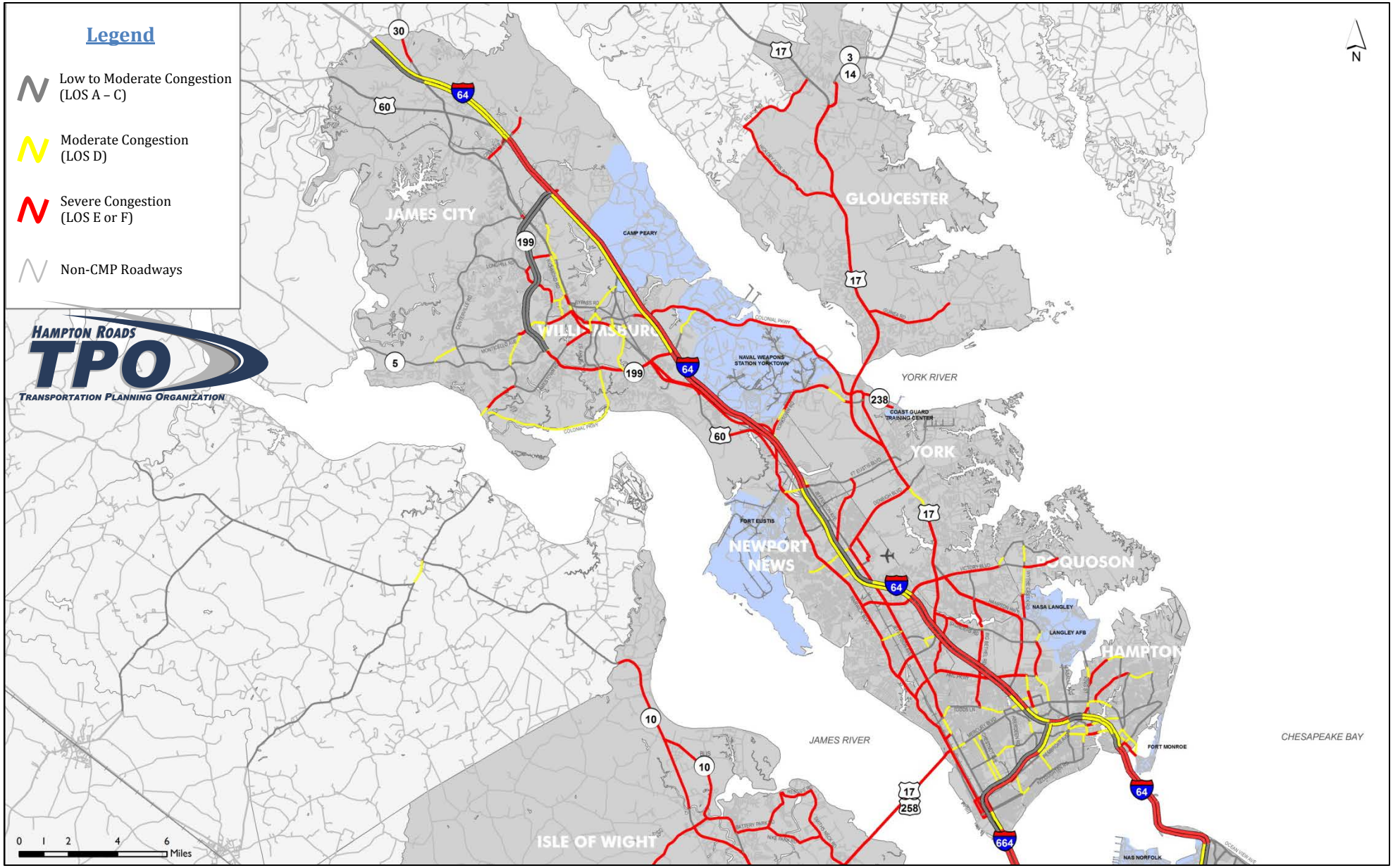
Figure 19.1 highlights the regional congestion statistics for these scenarios.

The maps on the following pages show the 2034 LRTP congestion level of roadways in Hampton Roads.

Figure 19.1: 2009 and 2034 Congested Lane-Miles

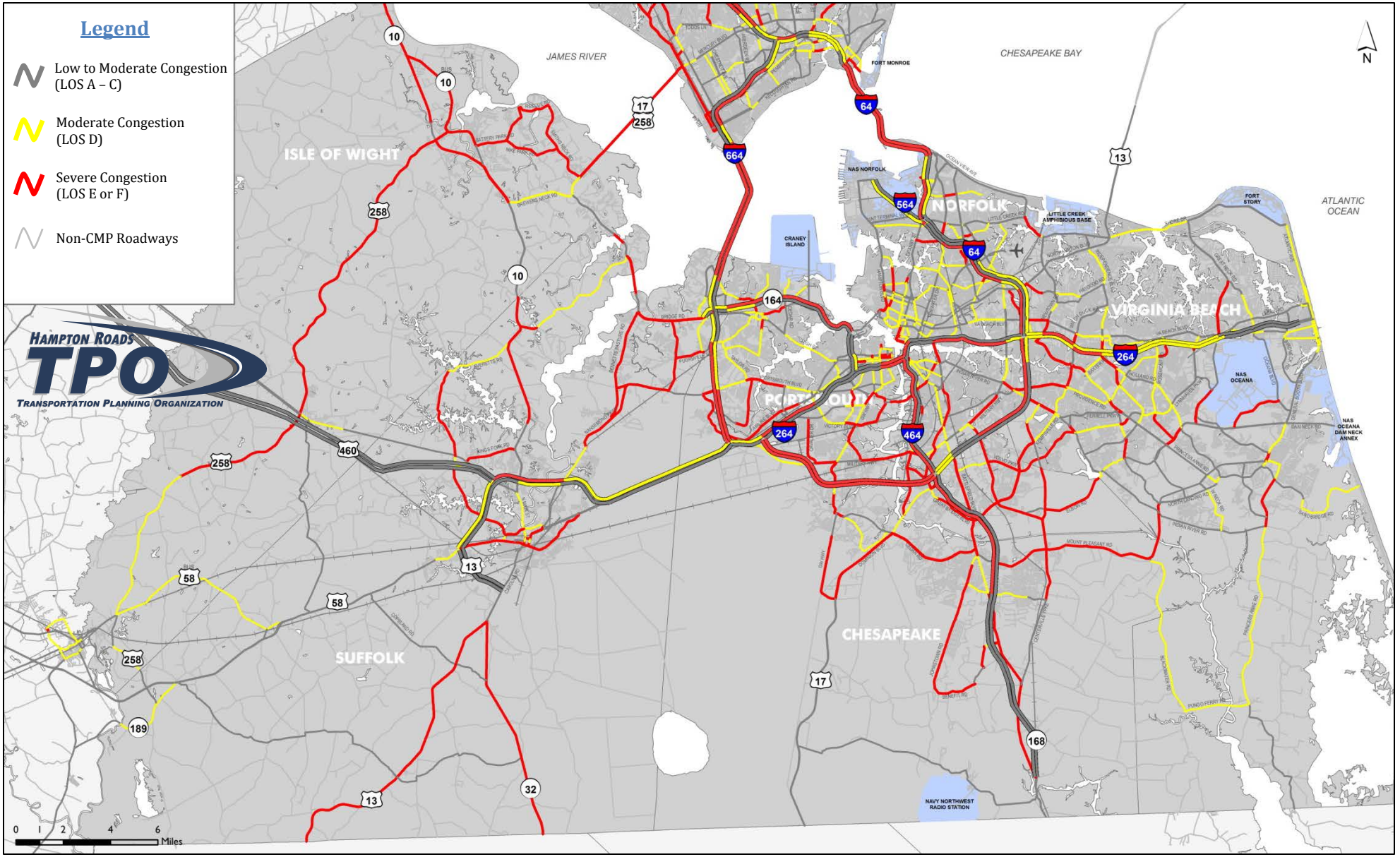


Map 19.1: 2034 PM Peak Hour Congestion Levels in Hampton Roads – Peninsula



Source: HRTPO.

Map 19.2: 2034 PM Peak Hour Congestion Levels in Southside – Hampton Roads



Source: HRTPO.

Air Quality Conformity

Air Quality Conformity is the link between air quality improvement and transportation planning. Before the 2034 LRTP can be implemented, the HRTPO must first demonstrate that the projects within the LRTP are compliant with the Virginia Department of Environmental Quality's State Implementation Plan (SIP), the state air quality plan. The SIP establishes regional pollutant thresholds for various sectors. The LRTP must ensure that estimated motor vehicle emissions generated from the projects in the regional transportation plan will not exceed the emissions limits set in the SIP's motor vehicle emissions budget. In simpler terms, LRTPs must show that transportation projects within the plan do not produce pollutants that exceed regional thresholds and will not cause new air quality violations. Otherwise, the transportation projects cannot be federally funded or approved.

Conformity applies to areas that are designated nonattainment and those areas re-designated to attainment after 1990, referred to as 'maintenance areas', for the following transportation-related criteria pollutants: ozone, particulate matter ($PM_{2.5}$ and PM_{10}), carbon monoxide (CO), and nitrogen dioxide (NO_2).

Figure 19.2: Air Quality Designations

Air Quality Designations	
Attainment Area	*Geographic area with air quality that is cleaner than the primary standard*
Nonattainment Area	*Geographic area with air quality that does not meet the primary standard*
Maintenance Area	*Geographic area that has been re-designated to attainment (from nonattainment)*

Hampton Roads Air Quality Planning Status

Hampton Roads is a designated maintenance area currently in attainment of the 1997 eight-hour ozone national ambient air quality standard (NAAQS)[1]; Hampton Roads is also in attainment of all other applicable NAAQS for transportation-related pollutants. The designated maintenance area includes the Counties of Gloucester, Isle of Wight, James City, and York; and the Cities of Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg. Because Hampton Roads is a maintenance area, federal transportation conformity requirements must be met.

[1] Hampton Roads was designated a maintenance area for ozone in June 2007.

Air Quality Conformity Tests

The 2034 LRTP must pass the following tests and analyses to meet the requirements for a positive conformity finding:

- Fiscal Constraint Analysis
- Latest Planning Assumptions
- Latest Emissions Model
- Interagency Consultation and Public Involvement Analysis
- Transportation Control Measures
- Regional Emissions Budget

As summarized in **Table 19.1**, the 2034 LRTP meets all applicable federal and state conformity requirements and criteria.

Table 19.1: Summary of Federal and State LRTP Conformity Requirements

Criteria	Demonstrated
Fiscal Constraint	Yes
Latest Planning Assumptions	Yes
Latest Emissions Model	Yes
Interagency Consultation and Public Involvement	Yes
Transportation Control Measures	N/A
Regional Emissions Budget	Yes

Fiscal Constraint Analysis

The 2034 LRTP is fiscally constrained and is financed by federal, state, local, tolls, and private sources. Detailed information on the financial analysis is included in Chapters 16, 17, and 18.

Latest Planning Assumptions

All requirements for the application of latest planning assumptions were met as follows:

- Latest available and approved population and employment forecasts for 2034 by Traffic Analysis Zone (TAZ), including interim years and sub-allocations as appropriate, were employed with the regional travel demand model network to generate traffic volume and vehicle-miles-traveled (VMT) forecasts applied in this conformity analysis.
- Regional roadway and transit networks were updated as appropriate using the 2034 LRTP and FY 12-15 TIP project lists, which were subjected to interagency consultation.

Latest Emissions Model

Requirements to apply the latest emission model were satisfied using MOBILE6.2[2] for this conformity analysis.

The EPA has released a newer emissions model (MOVES2010) for use in regional emissions analyses for transportation conformity determinations. However, the EPA has granted a two-year grace period (ending March 2, 2012) to switch to this newer model. Therefore, for regional conformity analyses

[2] MOBILE6.2 is an emission factor model for predicting gram per mile emissions of Hydrocarbons (HC), Carbon Monoxide (CO), Nitrogen Oxides (NOx), Carbon Dioxide (CO_2), Particulate Matter (PM_x), and toxins from motor vehicles under various conditions. http://www.epa.gov/oms/m6.htm.

initiated before or within the two-year grace period, the MOBILE6.2 model may continue to be applied.

Interagency Consultation and Public Involvement

The federal government has established regulations for interagency consultation; these regulations are reflected in both state and local regulations and requirements regarding interagency and public consultation procedures.

Throughout its development, the 2034 LRTP has been discussed at HRTPO Board meetings, working groups (including the 2034 LRTP Subcommittee), citizen and technical advisory committees, and public meetings. The HRTPO's Interagency Consultation Group (ICG) serves as the forum for interagency consultation regarding transportation conformity. The ICG includes representatives from HRTPO, VDOT, DRPT, FHWA, FTA, VDEQ, and the U.S. EPA. A representative of the Lead Planning Organization (LPO), designated as the Hampton Roads Air Quality Committee, also participates in consultation with the ICG. All ICG meetings are open to the public.

All of the latest planning assumptions and other aspects of the conformity analysis were reviewed by the Hampton Roads ICG at the beginning and throughout this conformity analysis process.

Consultation and public involvement pertaining to conformity is documented in the 2034 LRTP conformity report[3]. The HRPTO's public outreach effort regarding the 2034 LRTP is documented in Chapter 5. Other agency related public outreach efforts are documented in a separate Public Participation report[4].

Transportation Control Measures

The applicable SIP maintenance plan for Hampton Roads does not include transportation control measures (TCMs), strategies to reduce vehicle emissions, and is therefore not required for this conformity analysis or determination. Accordingly, credit for TCMs was not taken in this analysis.

Regional Emissions Budget

Regional emissions analysis compares on-road motor vehicle emissions to the applicable on-road motor vehicle emissions budgets in the SIP for the Hampton Roads region. To meet conformity, the LRTP and TIP must be consistent with the motor vehicle emissions budget set forth in the SIP.

Emission controls assumed for the analysis were consistent with those specified in the SIP's maintenance plan for Hampton Roads as shown in **Figure 19.3** on the following page.

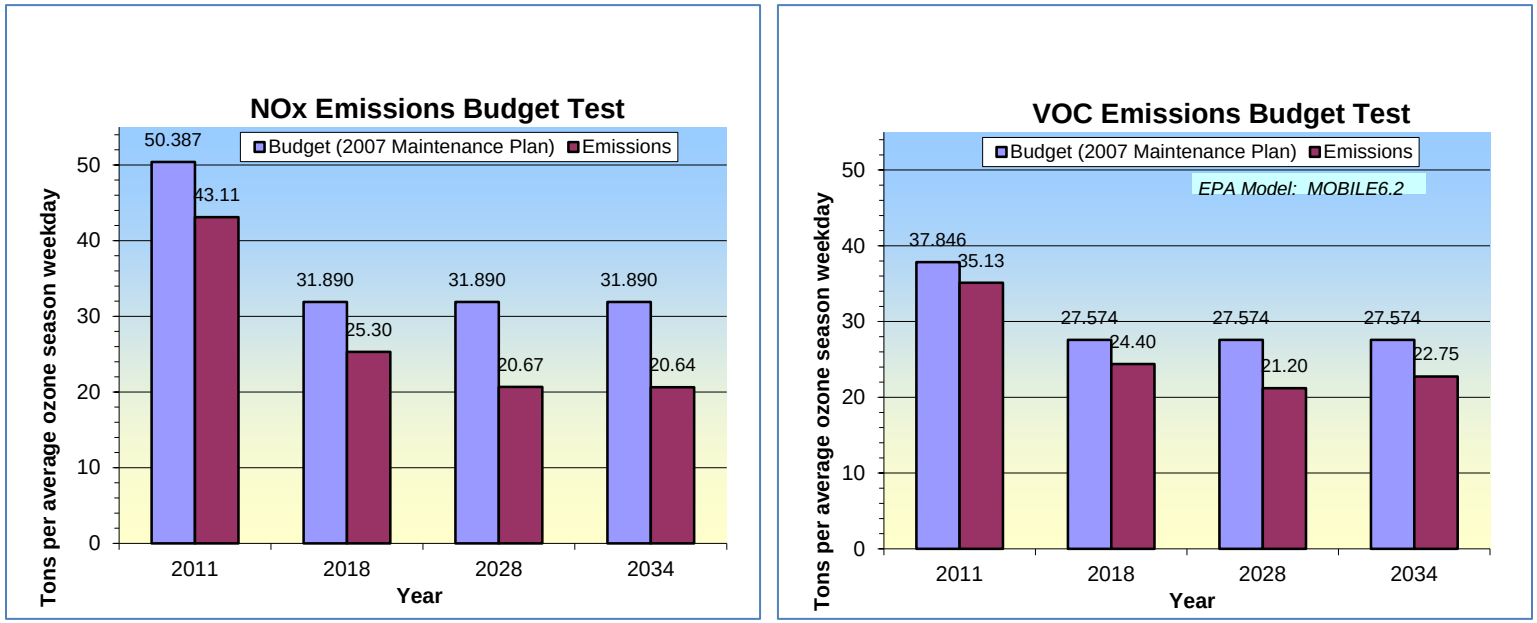
[3] Hampton Roads, Virginia Eight-Hour Ozone Maintenance Area Regional Conformity Analysis, 2034 Long Range Transportation Plan and FY 12-15 Transportation Improvement Program report, September 2011.

[4] Hampton Roads Transportation Planning Organization Public Participation Plan, December 2009

Conformity Finding

The conformity analysis results were forwarded to the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) on September, 16, 2011. A joint positive conformity finding for the 2034 LRTP was received from FHWA and FTA on December 12, 2011 (see Appendix J). The detailed transportation conformity analyses for the 2034 LRTP are included in the 2034 LRTP conformity report[5].

Figure 19.3: Emission Results for 2034 LRTP Air Quality Conformity Analysis (NOx and VOC)



Budgets as specified for ozone precursors (NOx and VOC) in the "Maintenance Plan for the Hampton Roads Nonattainment Area…" for the 1997 Eight-Hour Ozone Standard, approved by EPA in June 2007. Both budgets were modeled using the US EPA model MOBILE6.2.
Source: VDOT

[5] Hampton Roads, Virginia Eight-Hour Ozone Maintenance Area Regional Conformity Analysis, 2034 Long Range Transportation Plan and FY 12-15 Transportation Improvement Program report, September 2011.

Environmental Justice Analysis

Environmental Justice (EJ), as it relates to transportation planning, combines environmental awareness with racial, ethnic, and social awareness to ensure that transportation projects do not unfairly burden populations that may experience barriers to mobility. Central to the heart of EJ is the right to a safe, healthy, productive, and sustainable environment for all communities.

The HRTPO is committed to the principles of Environmental Justice and has taken steps to better inform and include those who traditionally have been left out of the transportation planning process. This commitment is detailed in the HRTPO *Public Participation Plan* and is embodied in the Four-Step Environmental Justice Evaluation framework[6]. During the development of the 2034 LRTP, staff applied this Four-Step framework to identify, conduct outreach, evaluate, and document EJ considerations.

Four-Step Environmental Justice Evaluation

The Four-Step Environmental Justice Evaluation provides a structured approach for preparing an EJ analysis and developing an effective public involvement strategy. The Four-Step framework sets out to:

1. Identify and map the distribution and concentrations of EJ Target Groups (groups described in Chapter 4).
2. Identify and apply public participation and outreach strategies to EJ communities.
3. Identify potential benefits and burdens of plans and programs for each target population.
4. Document EJ consideration in the transportation planning process.

An evaluation of EJ and outreach strategies begins by examining where traditionally underrepresented communities reside and seeks to ensure their involvement.

Step One: Identify Target Groups and Areas

Identifying EJ populations is necessary for conducting effective public outreach and for assessing the distribution of benefits and burdens of transportation plans and projects. The HRTPO staff identified and mapped Target Groups who often experience barriers to mobility. Target Groups include: Minority, Low-Income, Elderly, Medical and Functional Needs (People with Disabilities), Linguistically-Isolated Households, Households that Received Public Assistance, and Zero-Vehicle Households (descriptions of these groups can be found in Chapter 4).

In order to implement a focused approach in public participation and community outreach with limited staff resources, HRTPO staff established Target Areas. Target Areas are defined as those areas that capture minority and low-income populations above the regional average **and** at least three (3) other Target Groups above their respective regional average. The HRTPO staff intentionally does not specify which three of the remaining five Target Groups constitute a Target Area as it is assumed that the five Target Groups (Elderly, Population with Disabilities, Households with Zero Vehicles, Households that Received Federal Assistance, and Linguistically Isolated Households) are all equal in terms of being traditionally underrepresented and/or experiencing barriers to mobility.

Maps identifying Target Groups and Target Areas can be found at the end of this chapter.

[6] Four-Step Environmental Justice Evaluation is described in detail in the HRTPO *Public Participation Plan*, December 2009

Step Two: Public Participation and Outreach

Based on the geographic analysis of EJ populations, HRTPO staff conducted outreach activities to include these communities traditionally underrepresented in the transportation planning process. Details regarding outreach efforts are described in Chapter 5.

Step Three: Identify Benefits and Burdens

The goal of the 2034 LRTP EJ analysis is to ensure that when transportation decisions are made, EJ communities have ample opportunity to participate in the decision-making process **and** receive an equitable distribution of benefits and not a disproportionate share of burdens.

Since the LRTP is a long-range (twenty-year) plan, many projects are at the initial planning stage. As such, EJ analysis of benefits and burdens is more generalized at this stage than at later stages of project development (when more detailed information is available, such as exact project alignment). To investigate benefits and burdens, HRTPO staff incorporated data from the Project Prioritization Tool into GIS (Geographic Information Systems) to spatially represent potential benefits in relation to EJ Target Areas. Additionally, the total package of projects in the 2034 LRTP and fixed transit routes were also mapped in relation to EJ Target Areas.

Benefits Analysis

The Project Prioritization Tool evaluated candidate projects on numerous criteria, including potential benefits such as accessibility, safety, quality of life, and economic development. The HRTPO staff highlighted those projects that ranked high in these four categories and mapped the projects in relation to the Target Areas to ensure that EJ communities could benefit from these projects. This map can be found at the end of this section.

Another important benefit to EJ populations is access to alternate modes of transportation as these populations often do not have access to cars. The HRTPO staff mapped fixed transit routes in relation to EJ Target Areas. Maps can be found at the end of this section.

Figure 19.4: Criteria of EJ Benefits Analysis

Accessibility	•Projects that improve access to jobs or other opportunities
Safety	•Projects that improve safety, reduce crashes
Quality of Life	•Projects that improve commute times
Economic Development	•Projects that provide more opportunity

Burden Analysis

Transportation projects can provide many benefits to EJ communities; at the same time, projects within the LRTP cannot be disproportionately located in EJ communities. The HRTPO staff mapped all 2034 LRTP projects in relation to EJ communities to ensure the projects within the plan are fairly distributed across the region. This map can be found at the end of this section.

Conclusion of Benefits and Burden Analysis

As stated earlier, at the heart of EJ is the right to a safe, healthy, productive, and sustainable environment for all. Based on EJ analysis for the 2034 LRTP, HRTPO staff concludes the projects in the 2034 LRTP:

- Do not disproportionately burden EJ communities
- Provide equitable benefit of investment throughout the planning area, including EJ communities
- Planning considerations intend to distribute future benefits equitably and without consideration of race or income.

Step Four: Documentation of EJ Consideration

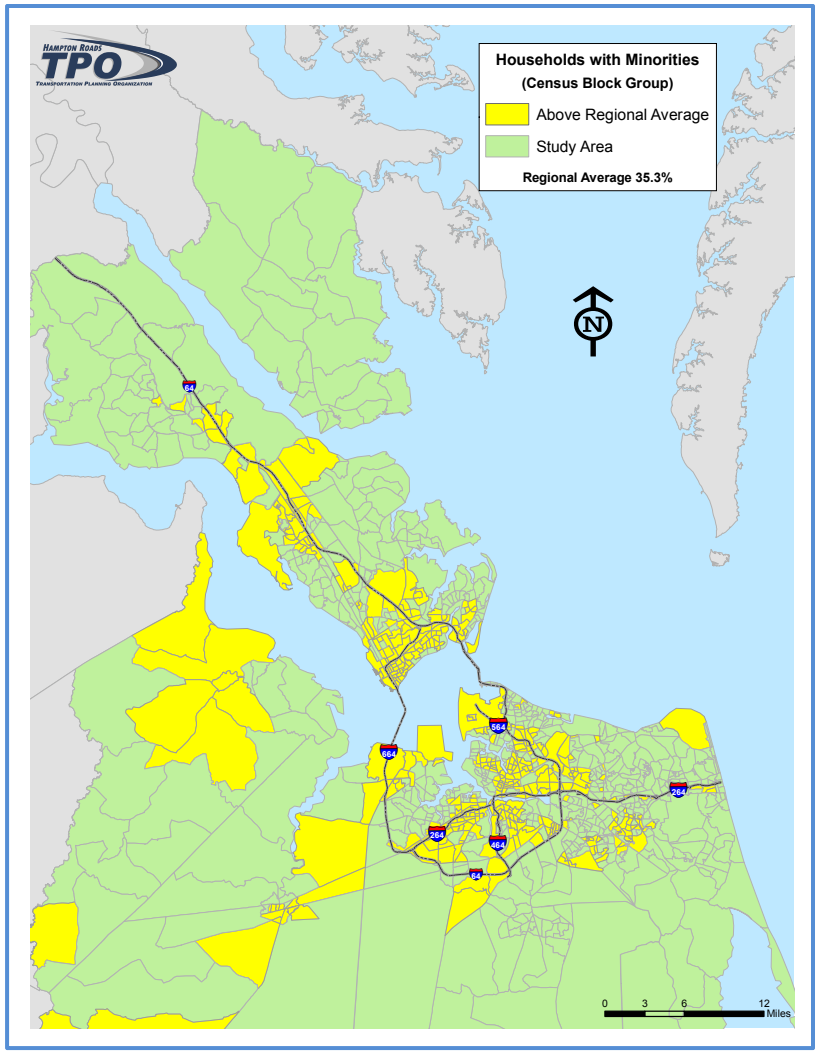
As stated in the HRTPO's *Public Participation Plan*, staff will document efforts related to EJ analysis. Below is a table summarizing key documentation as it relates to the 2034 LRTP. Additional information can also be found in the *Public Participation Plan*.

Table 19.2: Four Step EJ Evaluation Demonstrated in the 2034 LRTP

Effort	Documented	Chapter
Identification of EJ populations	Yes	4, 19
Summary of outreach efforts within EJ communities	Yes	5
List of agencies, organizations, and/or groups contacted and description of partnership activity	Yes	5
Summary of issues identified	Yes	19

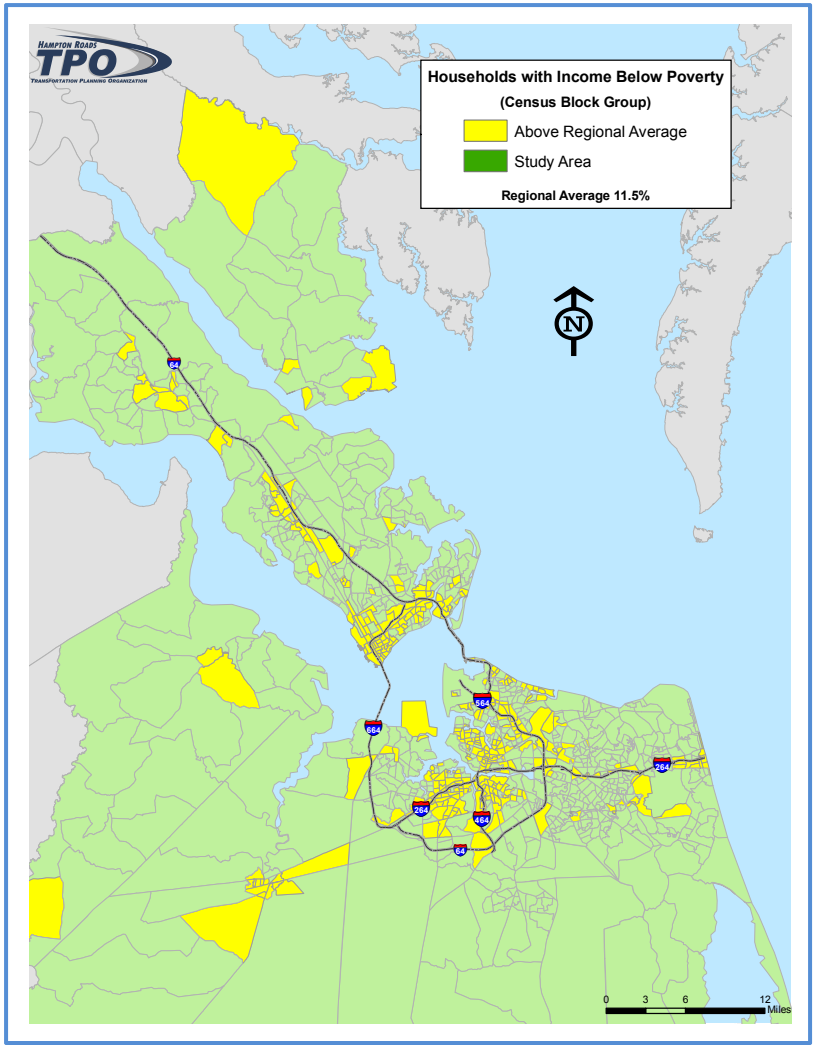
2034 LRTP Environmental Justice Analysis Maps

Map 19.3: Minority Households above Regional Average



Source: 2000 Census

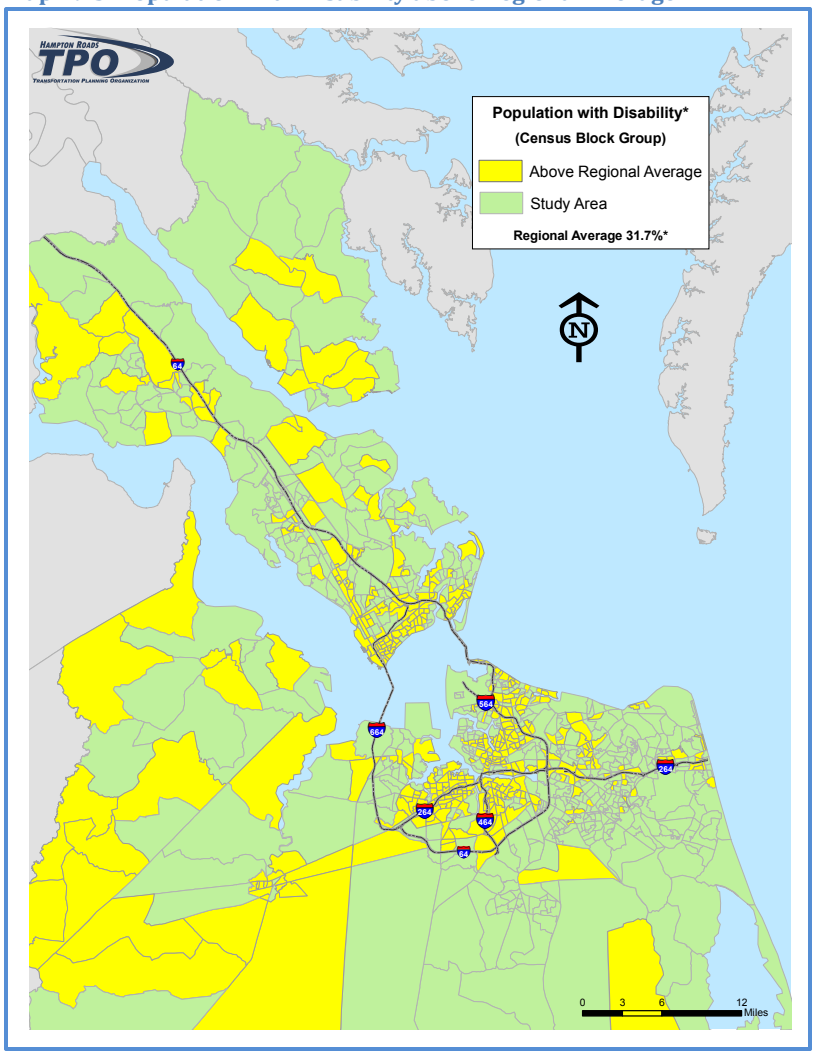
Map 19.4: Households with Income Below Poverty above Regional Average



Source: 2000 Census

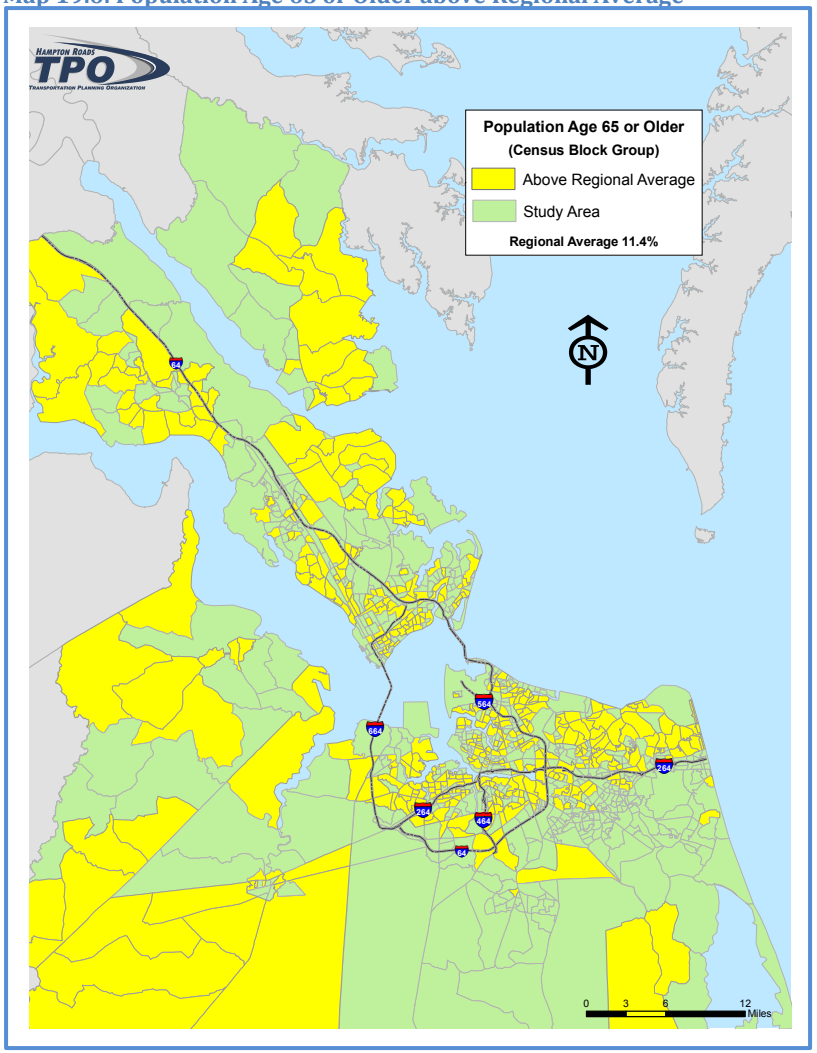
2034 LRTP Environmental Justice Analysis Maps (Continued)

Map 19.5: Population with Disability above Regional Average



Source: 2000 Census

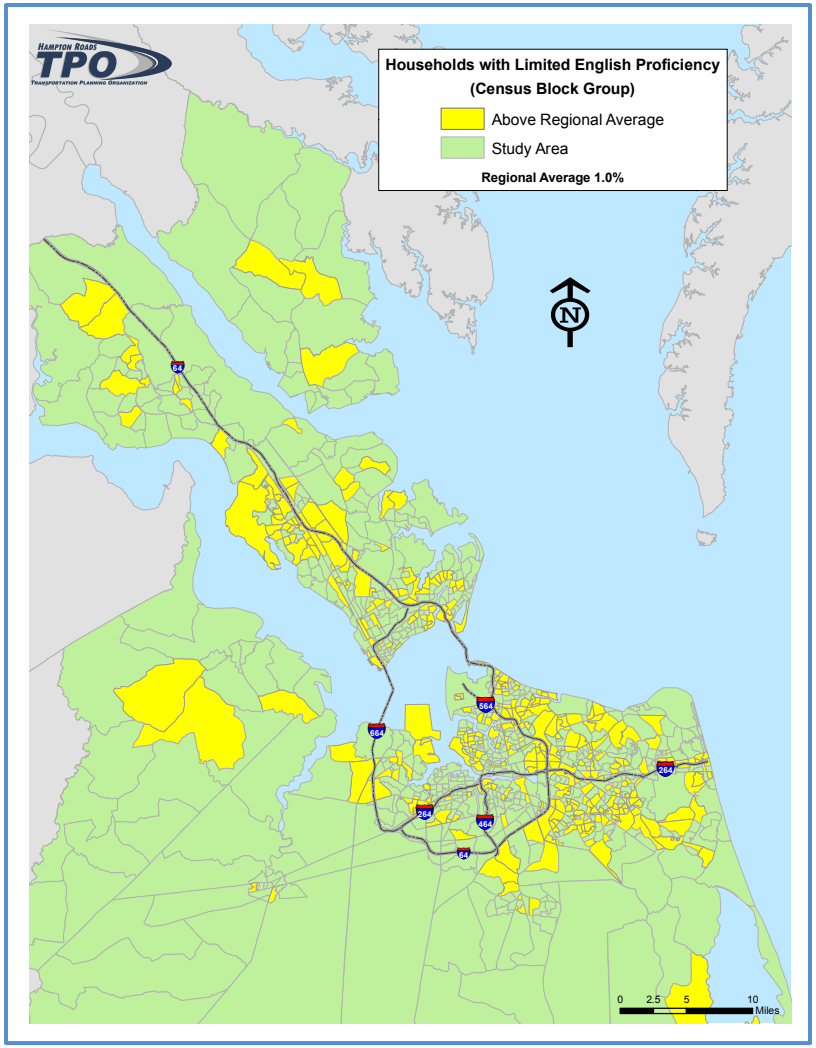
Map 19.6: Population Age 65 or Older above Regional Average



Source: 2000 Census

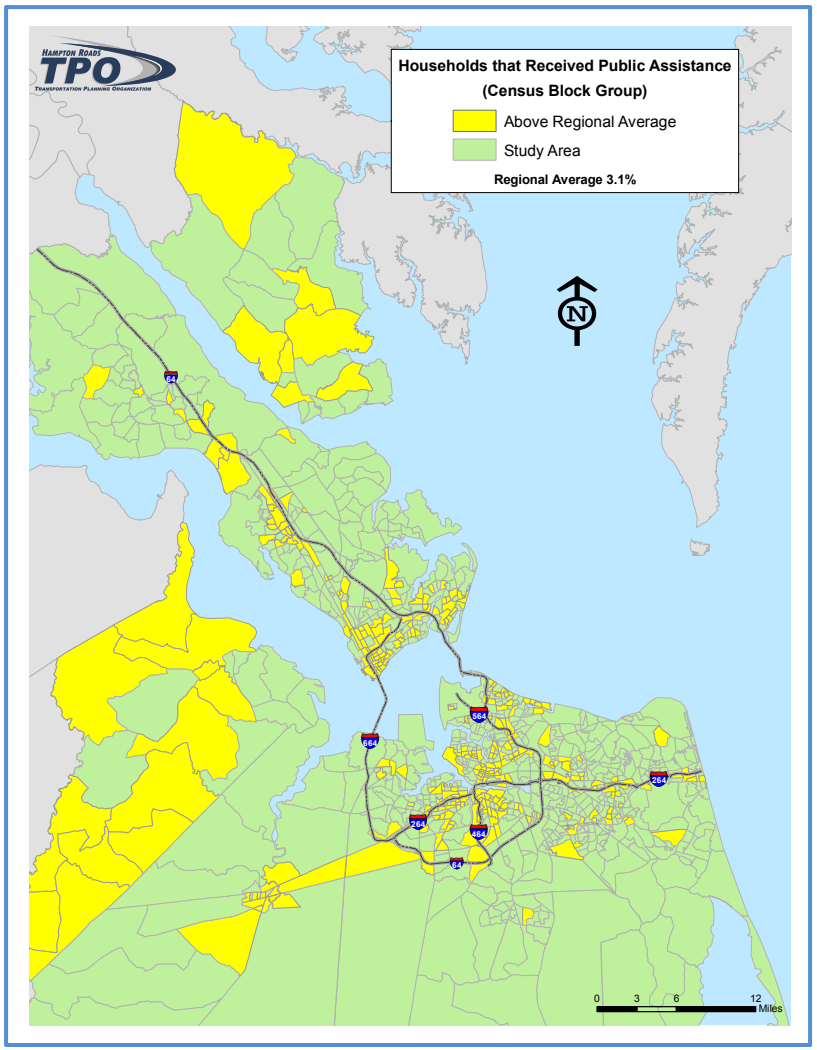
2034 LRTP Environmental Justice Analysis Maps (Continued)

Map 19.7: Households with Limited English Proficiency above Regional Average



Source: 2000 Census

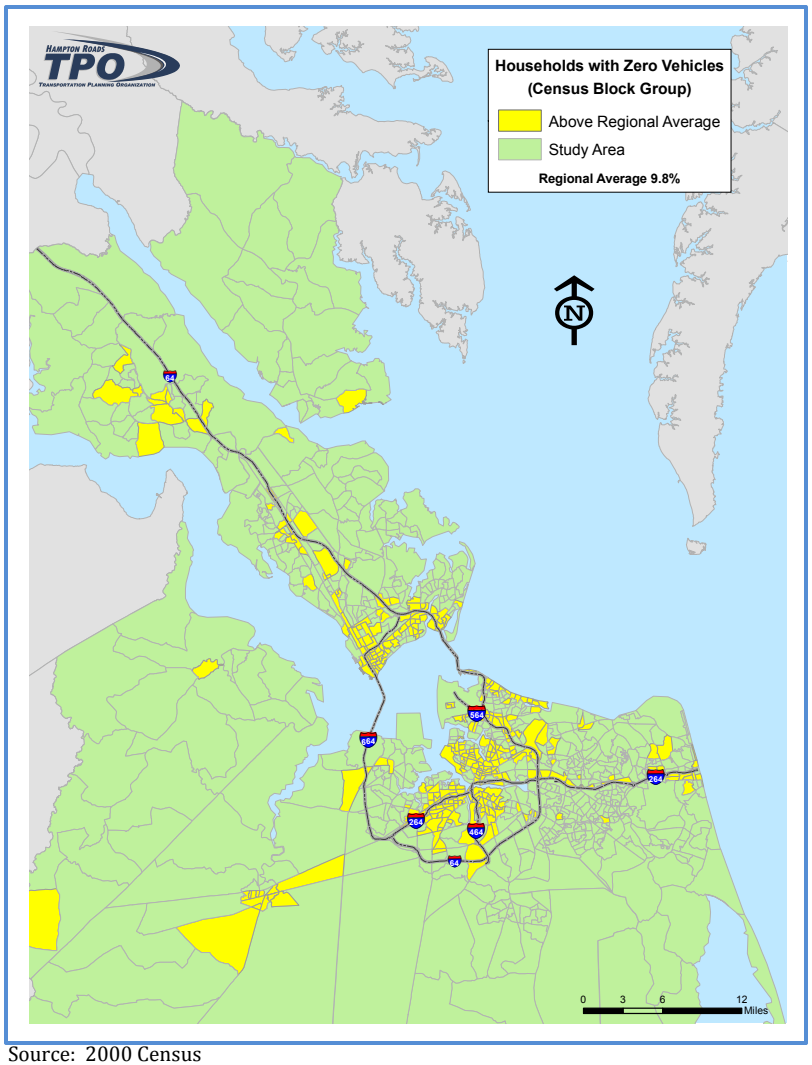
Map 19.8: Households that Received Public Assistance above Regional Average



Source: 2000 Census

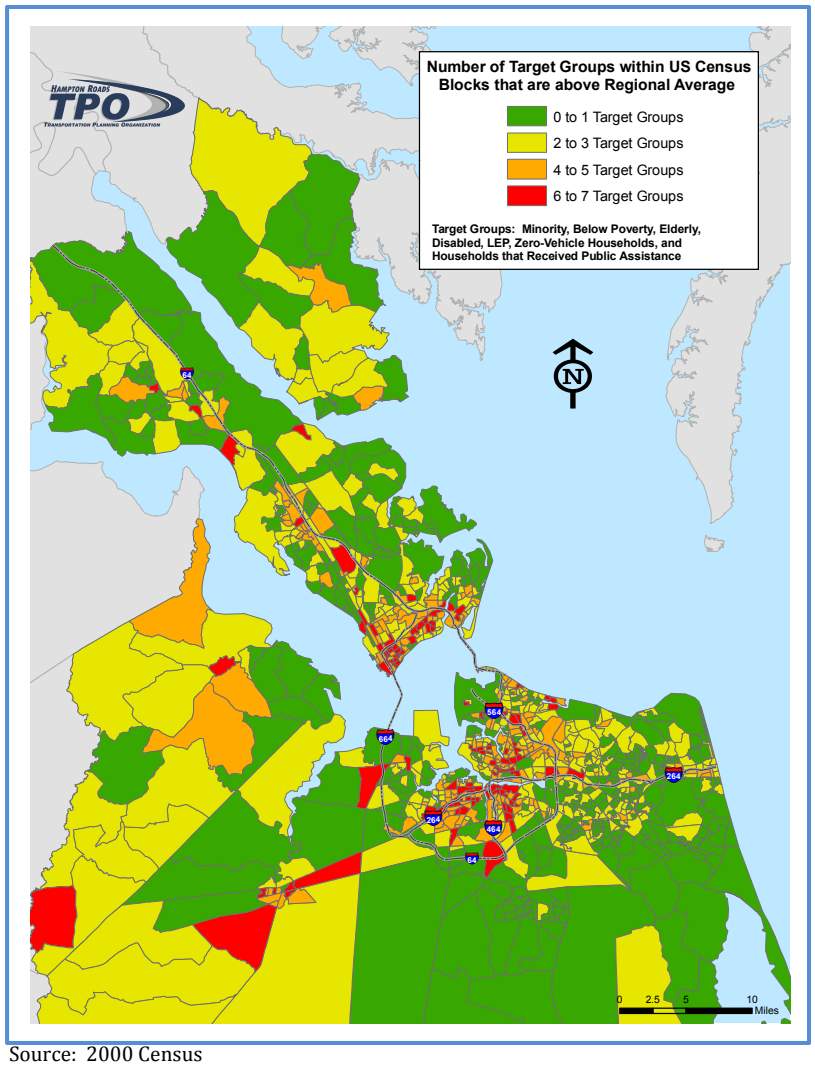
2034 LRTP Environmental Justice Analysis Maps (Continued)

Map 19.9: Households with Zero Vehicles above Regional Average



Source: 2000 Census

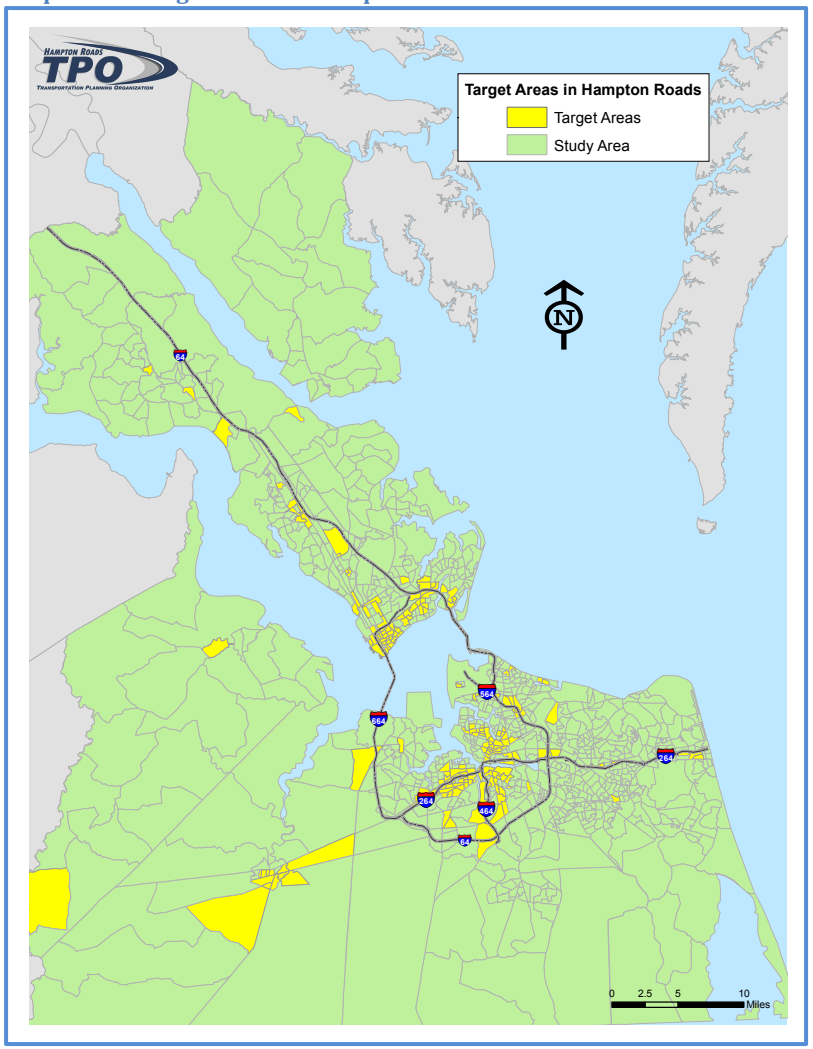
Map 19.10: Target Groups above Regional Average



Source: 2000 Census

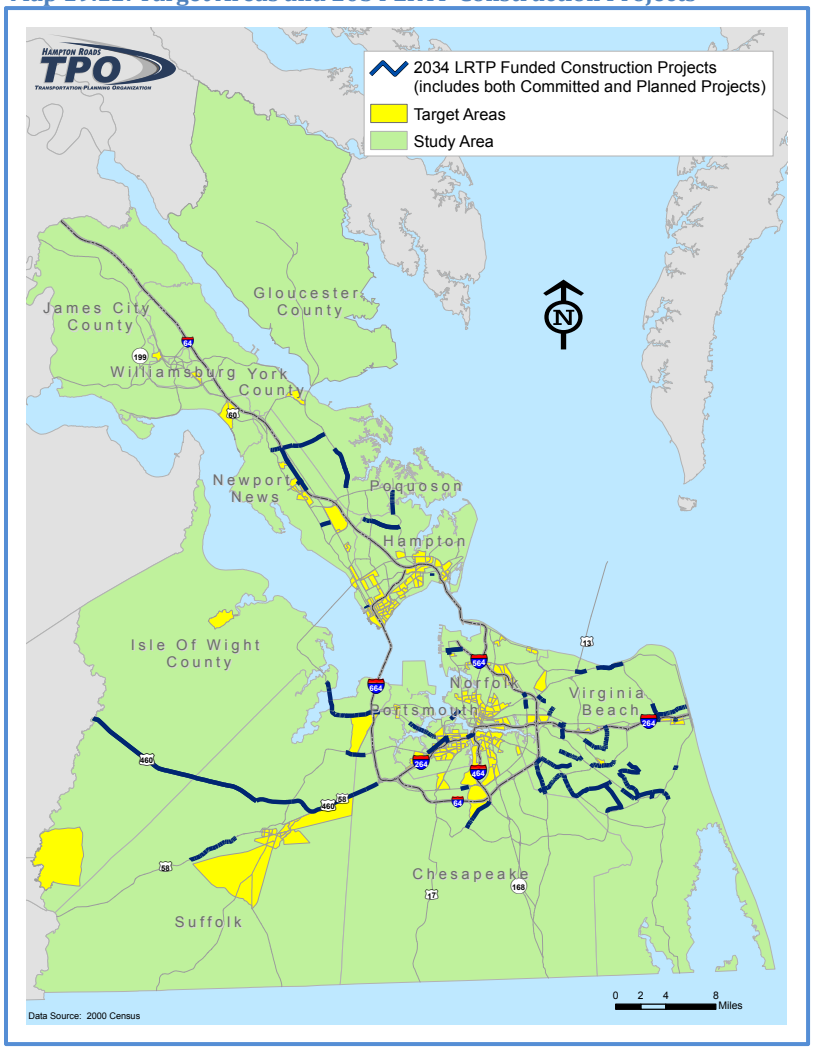
2034 LRTP Environmental Justice Analysis Maps (Continued)

Map 19.11: Target Areas in Hampton Roads



Source: 2000 Census

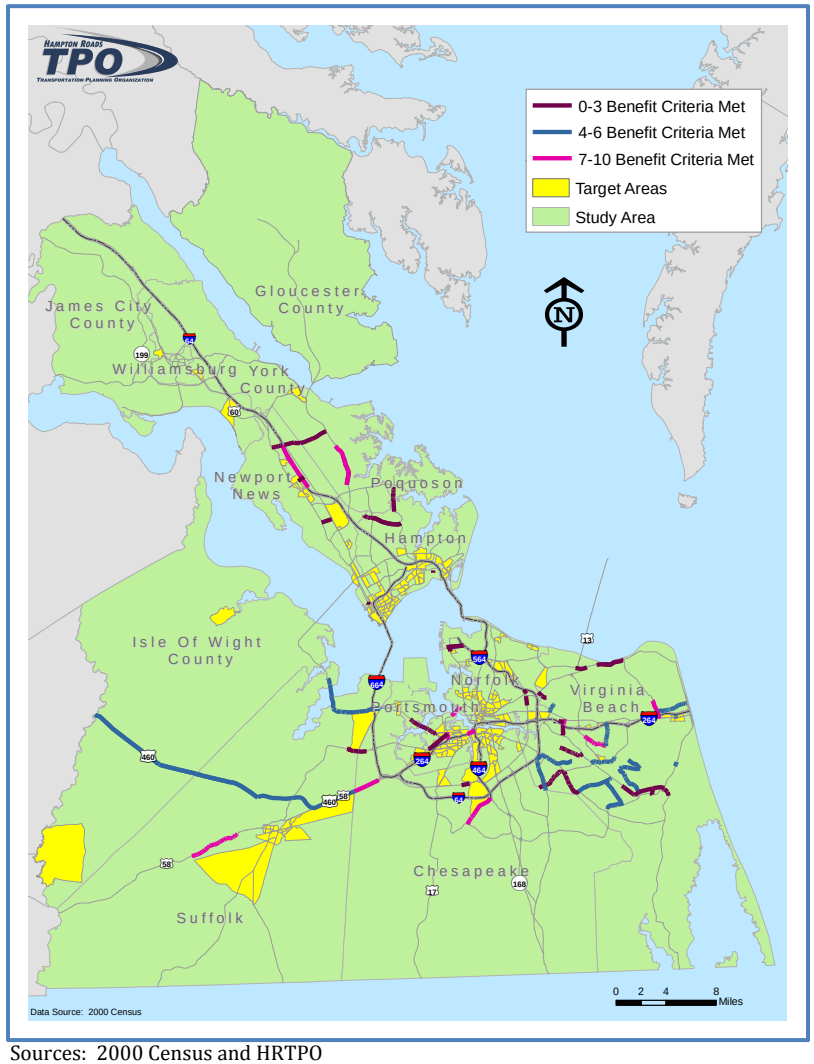
Map 19.12: Target Areas and 2034 LRTP Construction Projects



Sources: 2000 Census and HRTPO

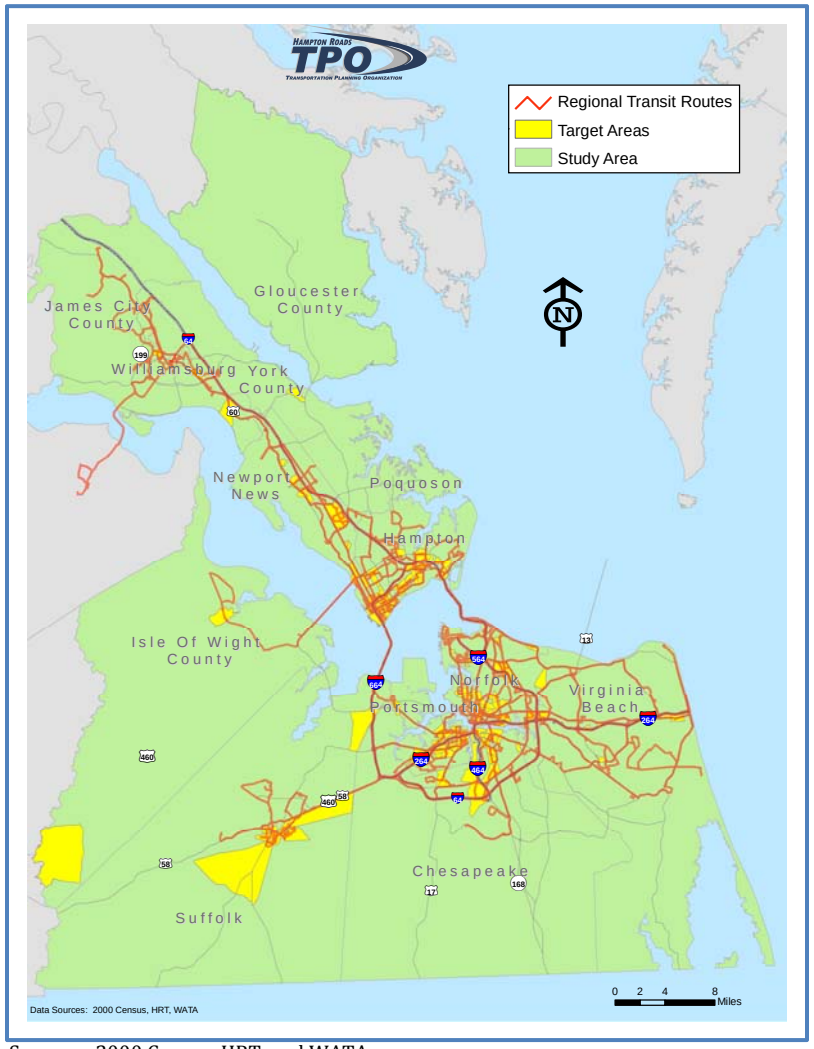
2034 LRTP Environmental Justice Analysis Maps (Continued)

Map 19.13: 2034 LRTP Benefit Criteria Analysis



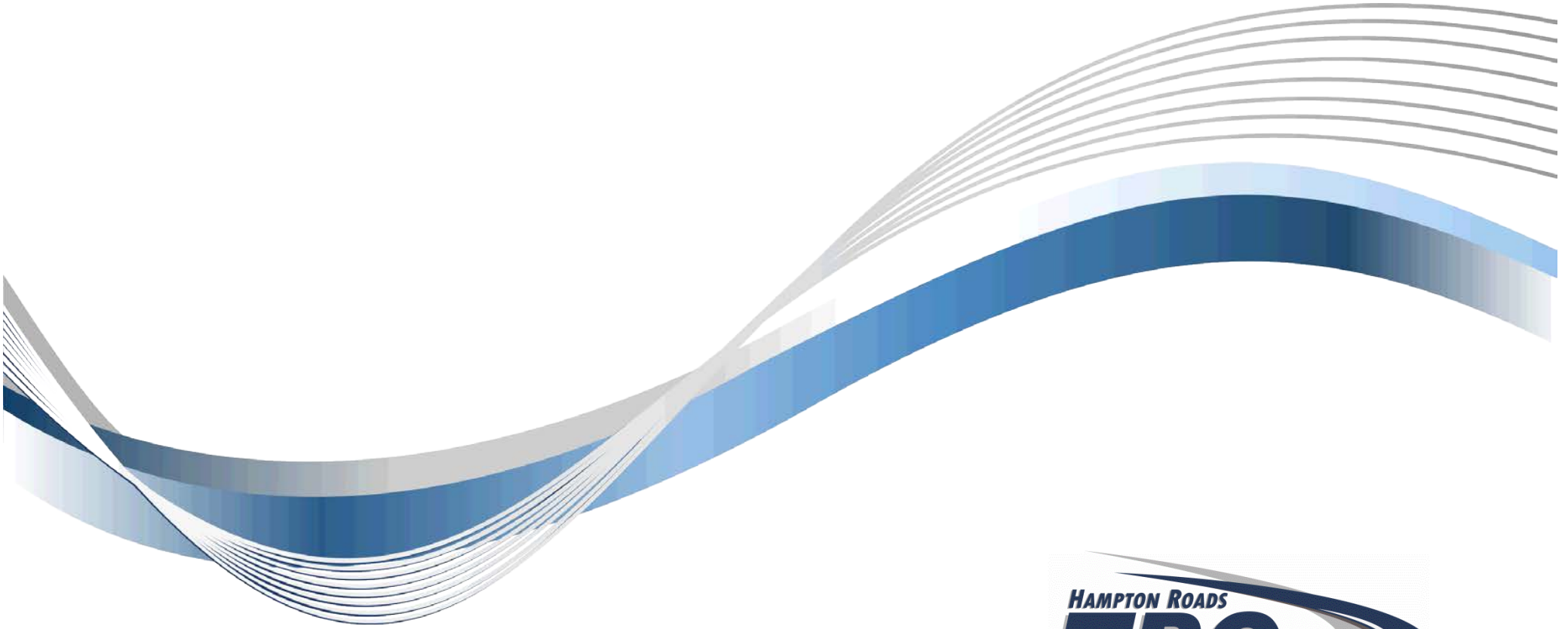
Sources: 2000 Census and HRTPO

Map 19.14: Target Areas and Regional Transit Routes



Sources: 2000 Census, HRT, and WATA
Note: HRT will discontinue service in the City of Suffolk as of December 31, 2011. Virginia Regional Transit will be the new transit provider for the City of Suffolk as of January 1, 2012.

Section 7 – Looking Ahead



IMPLEMENTATION AND MONITORING

The 2034 LRTP is the regional transportation plan that will guide the programming and construction of transportation investments in Hampton Roads. To help improve the transportation network of the region, projects from the LRTP will be built and/or studied, and strategies will be implemented. Additionally, because the LRTP is a dynamic transportation policy document, there are mechanisms in place to amend the plan in order to reflect changing priorities and challenges, as well as incorporate evolving needs.

Ft. Eustis Boulevard

Implementation

Transportation Improvement Program and the LRTP

The 2034 LRTP is the framework for coordinating regional transportation planning efforts in Hampton Roads over the next 20 years. The Transportation Improvement Program (TIP) is the program in which the 2034 LRTP is realized. The TIP is a four-year program and must be consistent with the current LRTP. In other words, projects programmed for implementation in the TIP must have costs and funding identified in the LRTP.

Before any federally-funded and/or regionally significant transportation project can be implemented, the projects must:

- Be explicitly listed in the adopted, conformity approved LRTP and TIP
- Be subjected to additional reviews (environmental, design, etc.)

As with the LRTP, the TIP must also be fiscally-constrained. This means that projects listed in the TIP must have reasonable funding identified to cover the cost of the projects in the four-year timeframe of the TIP.

The most recently approved TIP includes projects programmed for implementation between fiscal years 2012 and 2015; 16 of the regionally funded projects (construction and studies) from the 2034 LRTP are in the FY 2012-2015 TIP for implementation.

Regionally Significant Transportation Investment Studies

The 2034 LRTP contains 11 ongoing transportation studies in Hampton Roads (see Chapter 18 for list of studies). These studies, covering major investments in highway, bridge and tunnel, and transit infrastructure, are conducting alternative and environmental analyses, corridor feasibility, as well as defining the purpose and need of the proposed major investment[1]. The outcome of these ongoing transportation studies will inform policymakers on how to proceed with these investments, as well as provide information to advocate for investment funding.

Additionally, the HRTPO staff conducts several corridor and sub-area planning studies each year for various critical transportation issues in order to improve safety, mobility, and relieve congestion in the region. These studies are typically requested by local municipal governments, the HRTPO Board, and other stakeholders. The results of these corridor and sub-area studies can be used to select and implement logical improvements through the LRTP and the TIP.

LRTP Amendment Process

LRTPs are updated every four years; however, it is sometimes necessary to amend the plan between updates in order to reflect new funding circumstances or changes in regional priorities or challenges

The amendment process was established to accommodate requirements for state and federal funding, which calls for projects proposed to receive funding be part of a region's LRTP. Conversely, when previously identified funding is no longer reasonably available or another major barrier prevents the advancement of a fiscally-constrained transportation project towards construction, the amendment process allows the removal of the project from the list. Any funds freed up from the amendment process can then be allocated to other regional transportation priorities.

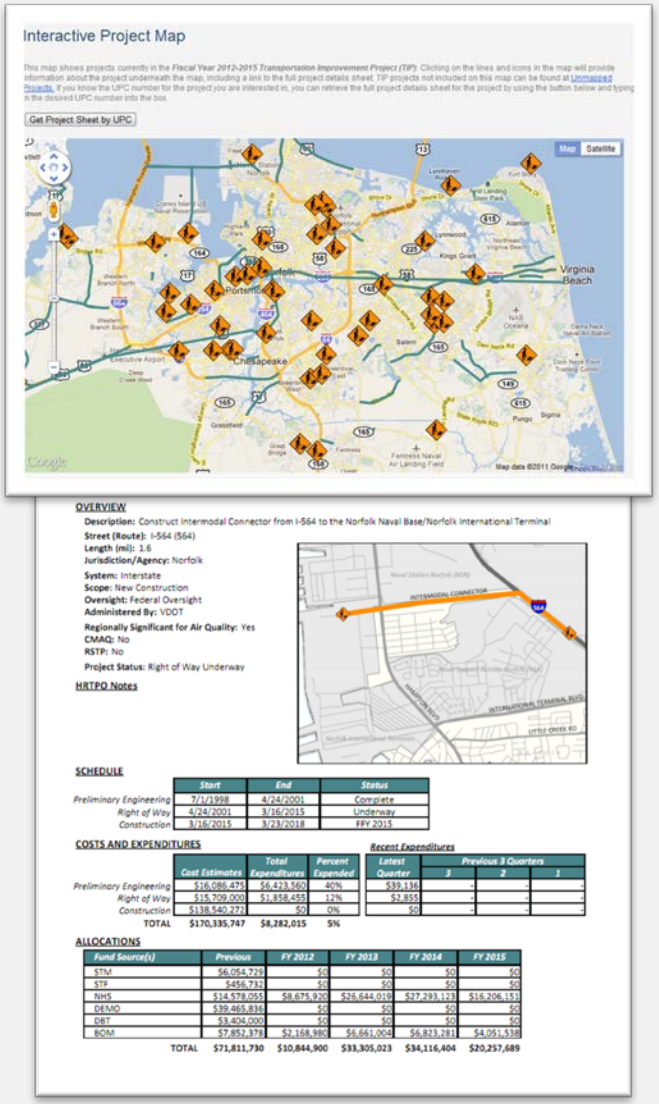
[1]Funding for these ongoing transportation studies are authorized under Sections 8, 9, and 26 of the Federal Transit Act, state planning funds, as well as planning and capital funds appropriated under Title 23, United States Code.

Program Accountability

With increasing demands to maximize limited transportation dollars, the HRTPO has made it a priority to help ensure that transportation funds are used as efficiently and effectively as possible. The Transportation Programming Subcommittee (TPS), comprised of local and state planners, review the programming and progress of regional transportation investments. Meeting quarterly (or more frequently, if necessary), the TPS advises the TTAC of technical programming and funding issues regarding the implementation of the TIP.

To improve its capabilities for monitoring the status of projects, the HRTPO staff introduced a new format in the recently approved HRTPO Fiscal Year 2012-2015 TIP. In addition to improving the transparency of the TIP, which provides enhanced project description information and a location map, the new format includes funding allocation information as well as cost estimates, schedules, obligations, and expenditures by project phase.

To further enhance the transparency and user-friendliness of the new TIP, HRTPO staff has developed a web-based application for accessing the TIP: www.hrtpotip.org. Along with providing access to the up-to-date TIP document, an Interactive Project Map service provides easy access to project information based on project location.



VDOT, Hurricane Irene Response Center

Monitoring

As part of its transportation planning efforts, the HRTPO staff continually monitors the regional transportation system. The HRTPO staff does this by continuously collecting multimodal data from a variety of sources and storing it in various databases for monitoring via the "State of Transportation" report, the Regional Performance Measures, the Congestion Management Process (CMP), and other transportation planning efforts.

State of Transportation

The HRTPO staff uses statistics compiled in regional transportation databases to produce the *State of Transportation in Hampton Roads* report. This report details the status on all facets of the transportation system in Hampton Roads, including air, rail, water, and highways.

The current status and trends for each of these aspects of the Hampton Roads transportation system are included in the report. New developments and significant changes to the regional transportation system are also highlighted. In many cases, comparisons are made between Hampton Roads and other comparable metropolitan areas.

The HRTPO staff updates the *State of Transportation* report on a biennial basis. The current report, as with all HRTPO publications, is available on the HRTPO website at www.hrtpo.org/TPO_Reports.asp.

Figure 20.1: Topics in the 2011 State of Transportation Report

STATE OF TRANSPORTATION IN HAMPTON ROADS INFORMATION

AIR TRAVEL –
- Passenger levels
- Airfares
- Nonstop destinations

RAIL TRAVEL –
- Amtrak passenger levels
- Rail safety

MARINE TRANSPORTATION –
- Cargo levels at the Port of Virginia
- Cruise passenger levels

TRANSPORTATION FINANCING –
- Transportation revenues and allocations
- Gasoline taxes/fees
- Roadway projects

ROADWAY TRAVEL –
- Vehicle-miles of travel
- Licensed drivers/registered vehicles
- Regional roadway capacity (lane-miles)
- Congestion
- Commuting methods and characteristics
- Crashes, injuries, and fatalities
- Trucks
- Public transportation usage
- Bicycling and Walking
- Transportation Operations

OTHER –
- Bridges
- Pavement condition
- Air quality

Regional Performance Measures

Measuring the operational success of a regional transportation system is no easy feat for any region. With new technologies and methods, quantifying the performance of the transportation network in Hampton Roads has come of age. This emergence in performance metrics aligns with increasing demands for accountability and maximizing benefits under a reality of scarce resources.

In 2009, the General Assembly of Virginia enacted regional transportation performance measurements into law. In response to the legislation, the HRTPO staff developed a list of regional performance measures (RPMs) in 2011, by adding metrics to those it was already producing through the CMP.

The HRTPO's regional performance measures fall into the following categories:

- Congestion reduction
- Safety
- Transit usage
- HOV usage
- Jobs-to-housing balance
- Access to transit
- Access to pedestrian facilities
- Air quality
- Movement of freight
- Vehicle Miles of Travel (VMT)
- Maintenance
- Financial system

In 2012, the HRTPO staff plans to calculate the metrics using the latest available data. The initial results of the performance metrics will provide the HRPTO Board guidance in setting performance targets. By evaluating these measures annually, the HRTPO Board can determine how its policies and investment strategies are impacting the operations of the regional transportation network.

Monitoring Congestion via the CMP

The CMP is the initial step in the cycle to address regional congestion. Whereas the State of Transportation and Regional Performance Measures monitor the region as a whole, the CMP monitors individual roadway segments, identifies congested locations, and develops strategies to address congestion and enhance mobility. As projects included in the LRTP are constructed in future years, the impacts on the regional roadway network will be monitored through the CMP. Some of these impacts include changes in traffic volumes, travel speeds, peak hour characteristics, and congestion levels and durations.

Monitoring Freight via the IMS

The HRTPO staff monitors freight data and movements for Hampton Roads through regional freight planning updates. These updates will include components such as inventory of freight facilities, trends and forecasts, commodity flow data, and regional truck movements.

The FTAC Subcommittee also meets every other month to discuss regional freight issues.

Monitoring Safety via the Regional Safety Study

HRTPO staff monitors roadway safety through the Regional Safety Study. *The General Crash Data and Trends* report, which details regional trends in crashes, injuries, and fatalities, and compares safety in Hampton Roads with other metropolitan areas, is produced on a regular basis.

In addition, HRTPO staff compiles and incorporates crash location data into a regional roadway safety database, determines high crash locations based on this data, and examines countermeasures and potential solutions to remedy safety related problems.

Lastly, the HRTPO, in partnership with VDOT and VDEQ, monitors legal, legislative, and election processes that may significantly impact transportation conformity requirements or the implementation of regional transportation investments.

Conformity

Within the Hampton Roads region, as outlined in Chapter 19, there are various monitoring procedures and conformity tests in which the LRTP and TIP have to pass to receive a federal conformity determination. The region can only have one federally approved and conforming LRTP and TIP for implementation, which must be consistent with each other. Projects being implemented have to ensure that the project design and scope are reflected in the region's TIP.

Furthermore, the HRTPO has to be kept abreast of any project of regional significance, regardless of funding stream. Projects such as the privately funded South Norfolk Jordan Bridge have the potential to impact the operations of the regional transportation network, and must be accounted for in the conformity process. If there are delays in implementing a transportation investment, the HRTPO has to account for them in the maintenance of the LRTP and TIP.

Intergovernmental Review

With many planning processes occurring simultaneously at various levels of government, the HRTPO is federally designated to review transportation plans, projects, programs, and associated policies for consistency with adopted regional plans and policies. Regionally significant transportation projects reviewed for consistency with regional plans are defined as: construction or expansion of freeways; state highways; principal arterials; routes that provide primary access to major activity centers, such as amusement parks, regional shopping centers, military bases, airports and ports; goods movement routes, including both truck routes and rail lines; intermodal transfer facilities, such as transit centers and rail stations; and fixed transit routes, such as light rail and bus rapid transit.

Highway Performance Monitoring System (HPMS)

The Highway Performance Monitoring System (HPMS), a database maintained by the FHWA, is used as a transportation monitoring and management tool to determine Virginia's share of federal highway funds to assist in setting transportation policies and to forecast future transportation needs as it analyzes the transportation systems' length, condition, and performance. Additionally, HPMS is used to provide data to the United States Environmental Protection Agency (EPA) to assist in monitoring air quality conformity. VDOT is the lead agency collaborating with FHWA on the maintenance of Virginia's HPMS.

Transit System Performance Assessment

It is the responsibility of HRT and WATA to coordinate and integrate their array of public transit modes into the regional transit system. The HRTPO monitors and evaluates transit operational performance to provide feedback which supports the modification and improvement of existing services and supports the implementation of new services.

Other Related Efforts

Regional transportation planning to develop the 2034 LRTP involves various parallel planning efforts by the HRTPO and its partner agencies. Data and analysis from the LRTP and these efforts can mutually support informed decisions. These efforts include:

VTrans 2035 – As Virginia's Long-Range Multimodal Transportation Plan, VTrans 2035 sets forth the transportation vision, needs, priorities, and strategies for the next twenty-five years.

Commonwealth Transportation Board's Six-Year Improvement Program (SYIP) – The Commonwealth Transportation Board (CTB) annually publishes the SYIP, a program for allocating funding for rail, public transportation, commuter assistance, bicycle, pedestrian, interstate, and primary highway transportation projects over the next six years

Commonwealth Transportation Board's Six-Year Operational Implementation Plan (SYOIP) – In 2012, the CTB is developing a SYOIP. The SYOIP is intended to create a framework for development

and delivery of operational and ITS related projects. Upon funding being identified for projects in the SYOIP, the project is then transferred to the SYIP.

Virginia Strategic Highway Safety Plan (VSHSP) – The Strategic Highway Safety Plan is a statewide, coordinated safety plan that provides a comprehensive framework for reducing highway fatalities and serious injuries on all public roadways. First published in 2006, VDOT is updating the VSHSP for a late 2011 release.

Hampton Roads Rural Long-Range Transportation Plan (RLRP) – The RLRP is an effort between the HRTPO, VDOT, and rural localities to develop a long-range regional transportation plan in rural areas to complement the metropolitan LRTP. The RLRP examines improvements that can be made in the near- and long-term in order to assess the effects of population and employment growth upon the transportation system. The current RLRP for Hampton Roads has a horizon year of 2035.

City/County Comprehensive Plans – Per state law, each jurisdiction in Hampton Roads prepares a comprehensive plan. The Comprehensive Plan highlights development trends, performance metrics, and growth policies for the locality. Within the plan, there is a transportation element that supports overall jurisdiction development. The HRTPO and VDOT jointly support the development of these transportation elements, which in turn, feed into the development of the region's LRTP.

Transit Operator Transit Development Plans – In collaboration with DRPT, transit operators develop and publish a Transit Development Plan (TDP). The TDP assists transit operators in improving their efficiency and effectiveness by identifying the need and required resources for modifying and enhancing services provided to the general public, and also helps operators effectively execute planning, funding, and implementation of public transit services.

Transit Operators' Performance Reports – Transit operators annually collect performance data for submission to the Federal Transit Administration (FTA). Data sent to the FTA is stored in the National Transit Database (NTD). The NTD provides a wealth of information that can be used to compare trends over time and among operators throughout the United States, as well as allocate federal transit funds.

Transit Operators' Triennial Audits – Transit operators undergo an audit by the FTA every three years to ensure that they comply with state and federal regulations. The audit findings and recommendations are published and reviewed by DRPT and other agencies.

Beyond the Horizon

The 2034 LRTP is the result of a four-year effort to develop the twenty-year transportation blueprint for Hampton Roads. As the region prepares to implement the 2034 LRTP and outline the next LRTP, there are efforts and ideas that will better prepare Hampton Roads for the future.

2034 Regional Transportation Vision Plan

Due to fiscal constraint issues, not all of the 150 candidate transportation projects could be incorporated into the 2034 LRTP. Of the candidate transportation projects submitted by regional stakeholders and concerned citizens, approximately 50 of these projects were included in the fiscally constrained LRTP.

The remaining candidate projects become part of the Regional Transportation Vision Plan, an illustrative list of beneficial transportation projects. These projects are unfunded investments (totaling approximately $19 billion) that warrant future consideration for inclusion in an amended 2034 LRTP should additional funding be identified. Appendix I provides a project listing of the 2034 Regional Transportation Vision Plan.

Two key elements of the 2034 Regional Transportation Vision Plan are:

- List of Projects for Future Consideration
- Construction component of ongoing transportation studies (studies with identified funding in the 2034 LRTP are investigating project benefits, alignments, alternatives, etc.; the construction component to these studies do not have identified funding)

The list of Projects for Future Consideration, specifically called out and approved by the HRTPO Board, are four priority transportation projects that should be incorporated into the 2034 LRTP as soon as appropriate funding becomes available. These projects, totaling approximately $2 billion in investment, are critical to the vitality of Hampton Roads and will have a significant impact to the regional transportation system. **Table 21.1** includes Projects for Future Consideration.

Regarding the ongoing transportation studies, approximately $12 billion of future construction investments to the regional transportation network are being evaluated. Based on the results of the ongoing transportation studies, some of these projects are anticipated to advance towards construction once appropriate funding is identified.

Figure 21.1: Process for Developing 2034 Regional Transportation Vision Plan

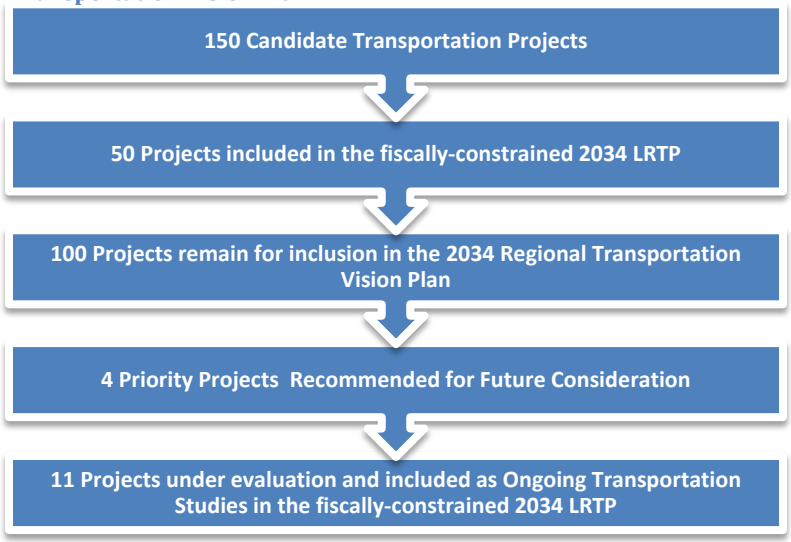


Table 21.1: Unfunded Projects Recommended for Future Consideration

Prioritization Category	Roadway Systems include Interstate and Interstate Interchange.	Locality	Rank in Roadway System	Prioritization Score
Highway Projects	**Interstate Roadway System**			
	I-64 (Ft Eustis Blvd to Route 199/exit 242)	Newport News/ James City Co/ York Co	1	178
	Interstate Interchange System			
	I-64/I-264 Interchange (including Witchduck Interchange)	Norfolk/ Virginia Beach	3	192
	I-64 Interchange Improvement at Ft Eustis Blvd	Newport News	8	149
Bridge & Tunnel Projects	I-64 Southside Widening (I-64/I-464 to I-64/I-664 at Bowers Hill)	Chesapeake	8	160

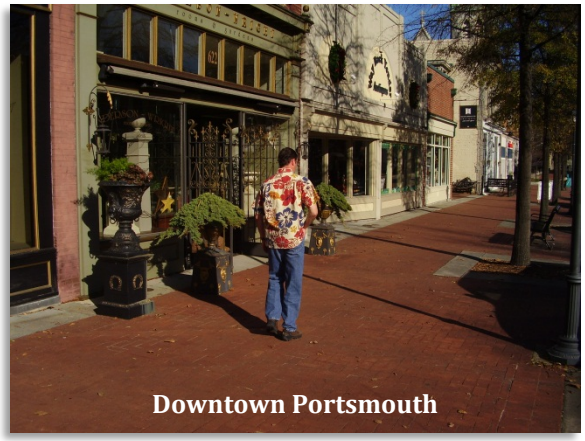
Regional Transit Vision Plan

The Hampton Roads Regional Transit Vision Plan identifies strategic investments to expand and enhance the transit system in the region. Recommendations from this plan will be considered for future LRTPs as well.

Project Prioritization

The 2034 LRTP presented an opportunity for Hampton Roads to define an approach to identify regional transportation priorities. The Project Prioritization Tool, described in Chapter 15, provided an objective methodology for evaluating the 150 candidate transportation projects. The results of the process included collective support from regional stakeholders and legislative leverage in the Virginia General Assembly for enhanced transportation funding for the region

The Project Prioritization Tool was designed to be a "living tool," responsive to emergent regional issues, priorities, and funding opportunities. As such, the HRTPO Staff, in consultation with stakeholders, will reevaluate prioritization criteria and associated weighting factors as necessary to address the current needs of the region.



Downtown Portsmouth

Planning for Sustainable Communities

In recent years, the interrelatedness and impacts of the transportation network on land use and development has begun to be recognized. Across various sectors of government, a new integrated approach is changing the way agencies approach planning for the future. At the federal level, new programs and grant opportunities strongly encourage and fund multidisciplinary approaches to development issues. At the state and regional levels, development plans are beginning to consider the interdependencies of plans. At the local level, comprehensive plans are improving the integration of sector specific plans around a unified community vision.

IN FOCUS: Livability Principles

The Livability Principles, published by the Partnership for Sustainable Communities (partnership between the U.S. Department of Transportation, the US Environmental Protection Agency, and the U.S. Department of Housing and Urban Development) , focuses on improving the coordination between housing, transportation, and environmental development policies. Applicable at the regional level, the principles can guide policy-making and investment decisions to maximize a return on investment and improve the regional quality of life. With constrained resources, unique regional development challenges, and a growing population with varying needs, it will become crucial for sector specific planning in Hampton Roads to come together over time to create a regional development framework. A model set of tenets for collaborative regional planning, the livability principles include:

- **Provide more transportation choices.** Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health.
- **Promote equitable, affordable housing.** Expand location- and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation.
- **Enhance economic competitiveness.** Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers, as well as expanded business access to markets.
- **Support existing communities.** Target federal funding toward existing communities—through strategies like transit oriented, mixed-use development, and land recycling—to increase community revitalization and the efficiency of public works investments and safeguard rural landscapes.
- **Coordinate and leverage federal policies and investment.** Align federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy
- **Value communities and neighborhoods.** Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods—rural, urban, or suburban.

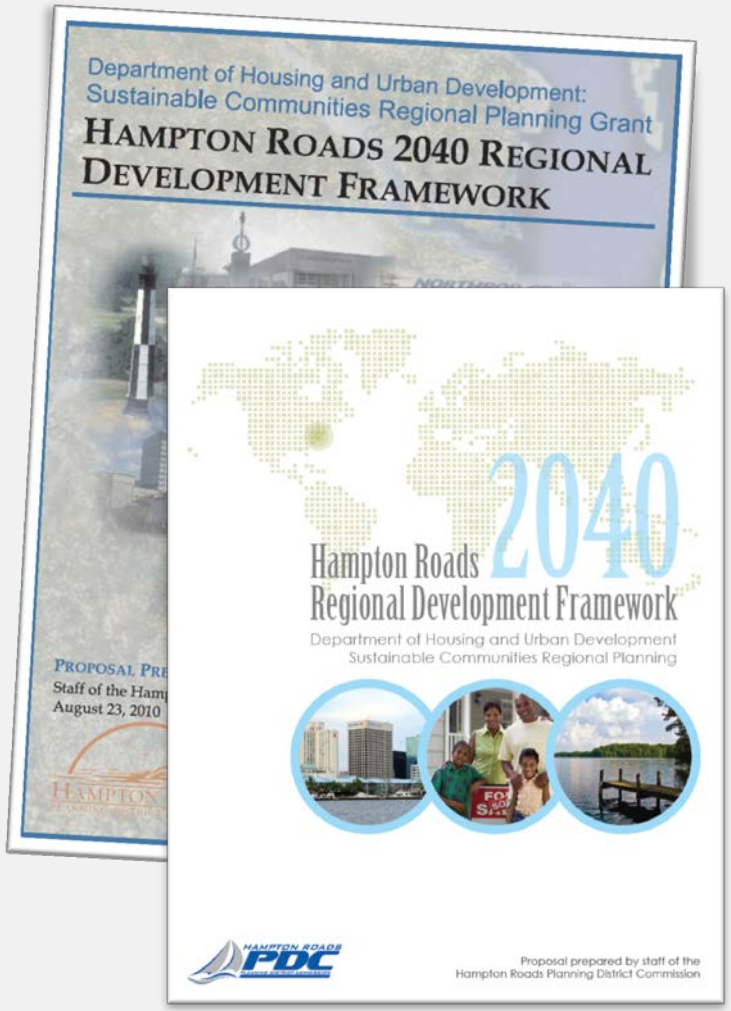
Source: Partnership for Sustainable Communities: www.sustainablecommunities.gov

Sustainable Communities Regional Planning Grant

The Hampton Roads region faces increasing demands and stresses on resources and infrastructure due to population growth and economic development. The regional and interdependent nature of these challenges means that localities have to come together to solve these challenges. The creation and adoption of a regional development framework would be a first step in coordinating development policy and decisions for the benefit of the entire region.

The Hampton Roads metropolitan area applied for a regional planning grant under the Department of Housing and Urban Development's Sustainable Communities Regional Planning Grant Program (SCRPG Program), allocated in Federal Fiscal Year (FFY) 2010 and 2011. The grant application looked to pursue the development of a Regional Development Framework for Hampton Roads with a 2040 horizon year. The proposed framework supports the development of a collaborative, multidisciplinary, interdependent approach to regional planning in Hampton Roads.

Though the Hampton Roads region was not a recipient in FFY 2010 nor in FFY 2011, the application process for the regional planning grant has seeded the collaborative, multidisciplinary, interdependent approach to historical planning issues.



Future LRTP Priorities

The conversation on regional transportation priorities in Hampton Roads has been vibrant and interactive among stakeholders and the public during the development of the 2034 LRTP. As the 2034 LRTP is implemented in the next four years, the regional discussion on transportation will continue.

In the next four years, the HRTPO will embark on its next LRTP. Some of the key issues to be addressed in the 2040 LRTP include:

- ***Transportation Funding*** - The 2034 LRTP was developed during a period of scarce funding options. Going forward, transportation dollars will potentially become more scarce as the need to fund deferred maintenance becomes acute. The 2040 LRTP will have to be shaped with fiscal prudence; continuing to prioritize, and investing in transportation investments that maximize regional benefits.

- ***Environmental Justice Planning*** - The 2034 LRTP made a concerted effort to reach out to historically disadvantaged groups, as well as document challenges to and strategies for enhancing their mobility. The 2040 LRTP will continue the commitment to ensure an equal opportunity process, as well as conduct a thorough assessment of priorities for environmental justice groups.

- ***Incorporation of Regional Performance Measures*** - During the 2034 LRTP development process, the HRTPO and the Commonwealth of Virginia outlined metrics to measure the transportation system performance. As the 2040 LRTP is developed, the results of these metrics will be benchmarked and guide strategic policy formulation and investment decisions.

- ***Multimodal Passenger Transportation Planning*** - The Regional Transit Vision Plan and the High-Speed and Intercity Passenger Rail Blueprint was developed in parallel to the 2034 LRTP. The 2040 LRTP presents the opportunity to implement these plans, as well as market multimodal passenger transportation alternatives to the public.

- ***Bicycle and Pedestrian Planning*** - The 2040 LRTP will enhance efforts in healthy communities through research and investments in bicycle and pedestrian transportation.

- ***Incorporation of Livability Principles*** - Considerations on how transportation affects the environment were incorporated into the 2034 LRTP. The 2040 LRTP presents the opportunity to explore the interdisciplinary relationship transportation has with other aspects of the built environment, and strategically collaborate policy and investments.

Going Forward

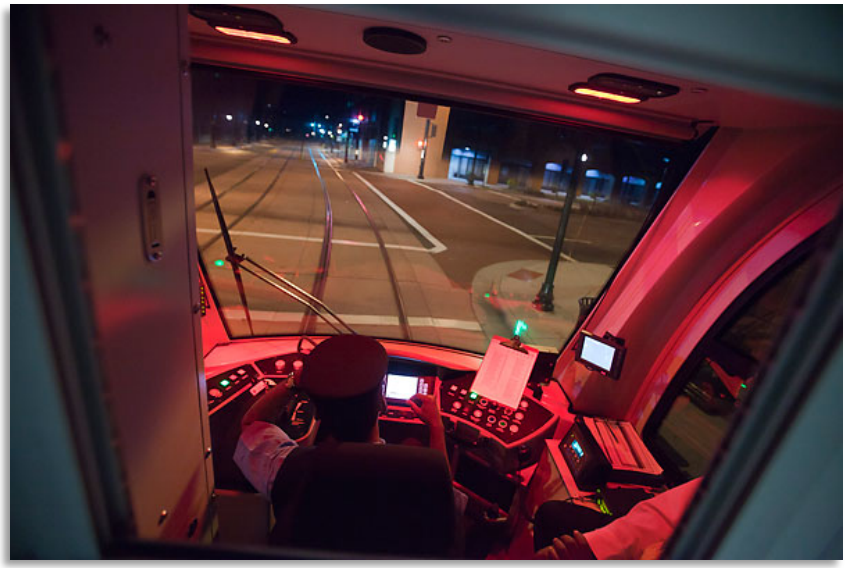
The 2034 LRTP includes strategic transportation investments, programs, and other endeavors to reduce congestion, improve mobility and accessibility for all users, support economic development, and improve the quality of life in Hampton Roads.

Funding the 2034 LRTP in a time of fiscal uncertainty presented an obstacle in which the region had to overcome. Through the exploration of public/private partnerships, tolling, locality contributions, and other financing mechanisms, the 2034 LRTP was able to leverage nearly $6 billion of funds in addition to the $1.25 billion of forecasted traditional funds.

The development of the 2034 LRTP also provided an opportunity for the Hampton Roads region to break new ground in transportation policy for regions in the Commonwealth, with the advent of a comprehensive Project Prioritization Tool. This tool produced a "playbook" of transportation priorities for Hampton Roads in which regional leaders can advocate in unison for additional transportation dollars from state and federal entities.

Methods for engaging the public during the development of the 2034 LRTP were improved. New technologies, such as visualization, online surveys, and social media, were paired with traditional outreach tools such as focus groups and public meetings in an effort to reach out to a broader audience. Finally, the School Outreach Program helped to cultivate the next generation of transportation users to be more informed and involved public stakeholders.

Changes resulting from emerging regional priorities and challenges may prompt updates to the 2034 LRTP and will also shape the development of the 2040 LRTP. As the direction of the Commonwealth and the Nation remains unclear in the midst of fiscal uncertainty, Hampton Roads has set the course in which to maintain and enhance the transportation system of the region.



Section 8 – References

Glossary of Acronyms and Abbreviations

ADA	Americans with Disabilities Act of 1990
AQ	Air Quality
AM	Morning
APM	A. P. Moeller - Maersk Group (freight shipping company)
ARRA	American Recovery and Reinvestment Act of 2009
ATI	Air Terminal Interchange
Ave	Avenue
Blvd	Boulevard
°C	Celsius
CA	California
CBBT	Chesapeake Bay Bridge Tunnel
CCI	Critical Condition Index
CFI	Continuous Flow Interchange
CFR	United States Code of Federal Regulations
CH (CHE)	City of Chesapeake
CIC	Craney Island Connector
CIKR	Critical Infrastructure and Key Resources
CL	City/County Line
CMAQ	Congestion Mitigation and Air Quality [Funding Program]
CMP	Congestion Management Process
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COA	Comprehensive Operational Analysis
CSX	CSX Transportation Incorporated (Class I freight rail company)
CTAC	Citizens Transportation Advisory Committee
CTB	Commonwealth Transportation Board
D.C.	District of Columbia
DMV	Virginia Department of Motor Vehicles
DoD	Department of Defense

Dr	Drive
DRPT	Virginia Department of Rail and Public Transportation
DSF	Dedicated and Statewide Funds
EA	Environmental Assessment
EB	Eastbound
EIS	Environmental Impact Statement
EJ	Environmental Justice
E-W	East-West
EPA	United States Environmental Protection Agency
FAF-3	Freight Analysis Framework 3
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FRA	Federal Railroad Administration
Ft	Fort
FTA	Federal Transit Administration
FTAC	Freight Transportation Advisory Committee
FY	Fiscal Year
GHG	Greenhouse Gases
GIS	Geographic Information Systems
GW	George Washington [Memorial Highway]
HC	Hydrocarbons
HHS	United States Department of Health and Human Services
HM	City of Hampton
HMOF	Highway Maintenance and Operating Fund
HOV	High Occupancy Vehicle Lane
HPMS	Highway Performance Monitoring System
HRBT	Hampton Roads Bridge-Tunnel
HRHIM	Hampton Roads Highway Incident Management Subcommittee
HRPDC	Hampton Roads Planning District Commission
HRT	Hampton Roads Transit [See TDCHR]
HRTO	Hampton Roads Transportation Operations Subcommittee
HRTPO	Hampton Roads Transportation Planning Organization
HSIP	Highway Safety Improvement Program

HSIPR	High-Speed and Intercity Passenger Rail
HTF	Highway Trust Fund (Federal)
Hwy	Highway
I-(#)	Interstate-(Number)
ICG	Interagency Consultation Group
IMS	Intermodal Management System
Int	Intersection
Intchg	Interchange
IRI	International Roughness Index
ITS	Intelligent Transportation Systems
JFCOM	United States Joint Forces Command
JRB	James River Bridge
KHA	Kimley Horn and Associates
LEP	Limited English Proficiency
Ln	Lane
LOS	Level of Service
LPO	Lead Planning Organization
LRTP	Long-Range Transportation Plan
MAX	HRT's Metro Area Express Bus Service
MLK	Martin Luther King Freeway
MMMBT	Monitor Merrimac Memorial Bridge Tunnel
Mph	Miles per hour
MPO	Metropolitan Planning Organization
MSA	Metropolitan Statistical Area
Multi	Multi-jurisdictional
N/A	Not applicable
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NC	North Carolina
NEPA	National Environmental Policy Act
NHS	National Highway System
NHTS	National Household Travel Survey
NIPP	National Infrastructure Protection Plan

NIT	Norfolk International Terminal
NN	City of Newport News
NO_x	Nitrogen Oxides
NO_2	Nitrogen Dioxide
NOR	City of Norfolk
NPS	National Park Service
NS	Norfolk Southern Corporation (Class I freight rail company)
NTD	National Transit Database
PE	Preliminary Engineering
Pkwy	Parkway
PM	Afternoon
PM_x	Ozone Particulate Matter
PNHMP	Peninsula Natural Hazard Mitigation Plan
POQ	City of Poquoson
POR	City of Portsmouth
PPP	Public Participation Plan
PPTA	Public-Private Transportation Act of 1995
RCTO	Hampton Roads Regional Concept of Transportation Operations
Rd	Road
RLRP	Hampton Roads Rural Long Range Transportation Plan
ROD	Record of Decision
ROW	Right of Way
RPM	Regional Performance Measures
RR	Railroad
RSA	Road Safety Audit
RSTP	Regional Surface Transportation Program[Funding Program]
Rte	Route
SAFETEA-LU	Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users
SHRHMP	South Hampton Roads Hazard Mitigation Plan
SIP	State Implementation Plan
SO_2	Sulfur Dioxide

SOV	Single Occupancy Vehicle
STRACNET	Strategic Rail Corridor Network
STRAHNET	Strategic Highway Network
SRTS	Safe Routes to School
SSEPP	System Security and Emergency Preparedness Plan
St	Street
SU (SUF)	City of Suffolk
SYIP	Commonwealth Transportation Board Six Year Improvement Program
SYOIP	Commonwealth Transportation Board Six Year Operational Implementation Plan
TAC	Technical Advisory Committee
TAZ	Traffic Analysis Zone
TCM	Transportation Control Measure
TDCHR	Transportation District Commission of Hampton Roads [See HRT]
TDM	Transportation Demand Management
TDP	Transit Development Plan
TEU	Twenty-foot equivalent unit (standard cargo container)
TIGER	Transportation Investment Generating Economic Recovery
TIP	Transportation Improvement Program
TMA	Transportation Management Areas
TOC	Transportation Operations Center
TOS	TRAFFIX Oversight Committee
Tpke	Turnpike
TPS	Transportation Programming Subcommittee
Tr	Trail
TRIP	The Road Information Program
TTAC	Transportation Technical Advisory Committee
TTF	Transportation Trust Fund (Virginia)
TVP	Hampton Roads Regional Transit Vision Plan
UPWP	Unified Planning Work Program
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USDHS	United States Department of Homeland Security

USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VA	Commonwealth of Virginia [Virginia]
VAHS	Virginia Department of Veteran Affairs and Homeland Security
VB	City of Virginia Beach
VBTES	Virginia Beach Transit Extension Study
VCC	Virginia Clean Cities
VCI	Virginia Council of Indians
VDCR	Virginia Department of Conservation and Recreation
VDEM	Virginia Department of Emergency Management
VDEQ	Virginia Department of Environmental Quality
VDGIF	Virginia Department of Game and Inland Fisheries
VDHR	Virginia Department of Historic Resources
VDOA	Virginia Department of Aviation
VDOF	Virginia Department of Forestry
VDOT	Virginia Department of Transportation
VMRC	Virginia Marine Resources Commission
VMT	Vehicle Miles Traveled
VOC	Ozone
VPA	Virginia Port Authority
VSHSP	Virginia Strategic Highway Safety Plan
VTRANS 2035	Commonwealth of Virginia Long Range Transportation Plan
WATA	Williamsburg Area Transit Authority
WB	Westbound
YOE	Year of Expenditure

Glossary of Terms

The following glossary of terms was compiled from an array of sources, which included the: Federal Highway Administration, Federal Transit Administration, Federal Railroad Administration, U.S. Department of Transportation, U.S. Department of Education, U.S. Department of Homeland Security, U.S. Department of Labor, Nashville Area MPO, Puget Sound Regional Council, Southern California Association of Governments, Tahoe MPO, Indianapolis Public Transportation Corporation, TriMet, Kalamazoo College, and Wikimedia Foundation. The HRTPO staff is responsible for the facts and the accuracy of the glossary's content.

Accessibility – The ability to get to any destination, measured by the availability of physical connections (roads, sidewalks, etc.), travel options, ease of movement, and nearness of destinations.

Activity Centers - Also known as centers, a defined focal area within a city or community that has a mix of housing, employment, retail and entertainment uses. It is pedestrian-oriented, which allows people to walk to different destinations or attractions.

Air Quality - Measure of the condition of air pollution.

Air Quality Conformity – An assessment of the compliance of transportation plans and programs with state air quality plans.

Allocated - Funding is budgeted to a project per VDOT's Six-Year Improvement Program.

American Recovery and Reinvestment Act of 2009 (ARRA) - Economic Stimulus package enacted by the 111th United States Congress in February 2009 and signed into law on February 17, 2009, by President Barack Obama. As it pertained to transportation, ARRA provided funds for transportation investment projects that were "shovel ready", to improve transportation infrastructure and create jobs.

Americans with Disabilities Act of 1990 (ADA) - Civil Rights law that prohibits discrimination in employment, transportation, housing choice, and other social services, based on disability.

At-Grade Crossing - A crossing of highways, railroad tracks, other guideways, and/or pedestrian walkways at the same level or grade.

Bikeway - Any road, street, path, or right-of-way that is specifically designated in some manner as being open to bicycle travel, either for the exclusive use of bicycles or shared use with other vehicles or pedestrians.

Bottleneck - Point-specific locations or small corridors where traffic delay regularly occurs.

Busway - A special roadway designed for the exclusive use of buses.

Capital Costs - Costs of long-term physical assets, such as equipment, rights-of-way, stations, buildings, and vehicles, traditionally identified with public transportation investments.

Carpool - An arrangement in which two or more people share the use and/or costs, of traveling in privately owned automobiles between fixed points on a regular basis. (See also vanpool.).

Clean Air Act (CAA) - The federal Clean Air Act identifies “mobile sources” (vehicles) as primary sources of pollution and includes specific requirements in metropolitan areas and states where attainment of federal air quality standards is a problem.

Climate Change - Refers to the variation in the earth’s global climate (or in regional climates) over time. It describes changes in the variability or average state of the atmosphere.

Commuter Rail - Short-haul rail passenger service operated within metropolitan and suburban areas.

Comprehensive Plan - A document that provides framework and policy direction to guide the future growth and development of a local jurisdiction

Compressed Work Week - Alternative work arrangement where a standard workweek is reduced to fewer than five days,

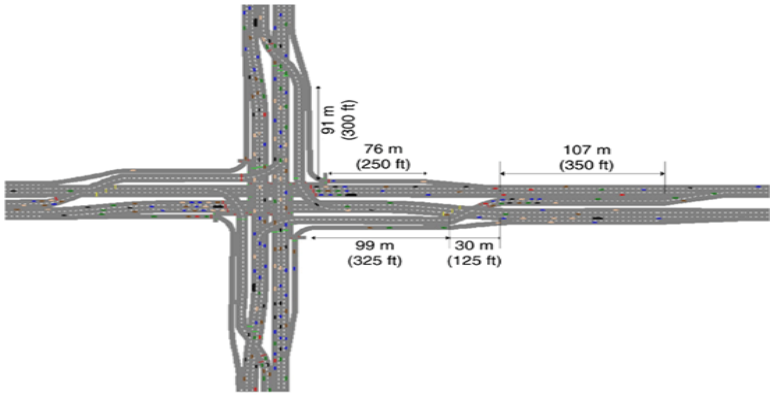
and employees make up the full number of hours per-week by working longer hours.

Congestion - A condition characterized by unstable traffic flows that creates stop-and-go movement on a transportation facility. Nonrecurring congestion is caused by actions such as special events, weather, and/or traffic crashes. Recurring congestion is caused by problematic facility design at a key location or constant excess volume compared with capacity.

Congestion Management Process (CMP) - A process conducted by MPOs for evaluating the level of congestion on the region's transportation system, and for identifying strategies which will reduce this congestion.

Congestion Mitigation and Air Quality (CMAQ) - Federal funding program conceived to support surface transportation projects and other related efforts that contribute air quality improvements and provide congestion relief.

Continuous Flow Intersection/Interchange (CFI) - An at-grade intersection that moves the turning vehicles, conflicting with the through-movements (to the left where traffic drives on the right, and vice-versa), out of the main intersection.



Continuous Flow Intersection (Source: FHWA)

Corridor - In planning, a broad geographical band that follows a general directional flow or connects major sources of trips. It may contain a number of streets, highways, transit lines, and routes.

Critical Infrastructure and Key Resources (CIKR) - The assets, systems, and networks, whether physical or virtual, so vital to the United States that their incapacitation or destruction would have a debilitating effect on security, national economic security, public health or safety, or any combination thereof.

Discretionary Funds - Any funds whose distribution is not automatic. Decisions on the distribution of discretionary funds are usually made by an agency or person in accordance with legal/regulatory criteria. Dedicated and Statewide Funds are an example of a discretionary fund.

Earmark - Legislative provision that directs approved funds to be spent on specific projects.

Environmental Impact Assessment (EA) - Assessment of the possible positive or negative impact that a proposed project may have on the environment, together consisting of the natural, social and economic aspects.

Environmental Impact Statement (EIS) - Document required by the National Environmental Policy Act for certain actions "significantly affecting the quality of the human environment".

Environmental Justice (EJ) - The fair distribution of costs and benefits, based on a concern for social equity. Environmental Justice helps to ensure that programs, policies, and activities that have adverse effects on communities do not affect historically disadvantaged populations disproportionately.

Environmental Protection Agency (EPA) - Federal agency charged with protecting human health and the environment, by writing and enforcing regulations based on laws passed by Congress.

Equity - In transportation, a measure of fairness among transportation users, and certain populations are not unfairly burdened by transportation improvements.

Federal Highway Administration (FHWA) – The agency of the U. S. Department of Transportation that funds surface transportation planning and programs, primarily highways.

Federal Railroad Administration (FRA) - The agency of the U. S. Department of Transportation that funds surface transportation planning and programs, primarily rail.

Federal Transit Administration (FTA) – The agency of the U.S. Department of Transportation that funds surface transportation planning and programs, primarily transit.

Finding of No Significant Impact (FONSI) - Decision rendered by the EPA based on environmental analysis and interagency review during the EA process, which finds a project to have no significant impacts on the quality of the environment.

Fiscal Constraint - Demonstration of sufficient funds (Federal, State, local, and private) to implement proposed transportation system improvements, as well as to operate and maintain the entire system, through the comparison of revenues and costs.

Fixed-Route Transit - Regularly scheduled service operating repeatedly over the same street or highway pattern on a determined schedule. HRT and WAT are the regional operators providing fixed-route transit service.

Flextime - Non-traditional work scheduling practice which allows full-time employees to choose their individual starting and ending times within certain limits.

Functional Classification – A hierarchical system of categorizing streets and roads on the basis of the way they are used, the volumes of traffic they carry, and the way they function within the context of the overall transportation system.

Functionally Obsolete - Bridges are those with deck geometry (e.g., lane width), load carrying capacity, clearance, or approach roadway alignment that no longer meet the criteria for the system of which the bridge is a part.

Geographic Information Systems (GIS) – A system of computer software, hardware and data to help manage, analyze and display information based on a geographical location, usually with maps.

Grade-Separated - The use of tunnels, bridges and other structures to separate levels on which roadway, railroad tracks, guideways and walkways intersect.

Greenhouse Gas - Components of the atmosphere that contribute to global warming, including water vapor, carbon dioxide, methane, nitrous oxide, and ozone. Human activities have added to the levels of most of these naturally occurring gases.

Greenways - Interconnecting paths designed to accommodate bicycle and pedestrian uses. Greenways link our natural areas and make them accessible to our communities. The East Coast Greenway is an example.

Guideway - In transit systems, a track or other riding surface (including supporting structure) that supports and physically guides transit vehicles specifically designed to travel exclusively on it.

Heavy Rail - An electric powered rail transit system that operates on a completely grade-separated right-of-way. Generally characterized by wide station spacing (1 to 2 miles apart), high average operating speeds, and greater capacity than light rail.

High-Occupancy Toll (HOT) Lanes - HOV lanes that also allow lower occupancy vehicles to gain access to the lanes by paying a toll.

High-Occupancy Vehicle (HOV) - A motor vehicle with two or more people traveling in it. Includes carpools, vanpools, and transit.

High-Occupancy Vehicle (HOV) Lanes – Lanes on heavily congested roadways that are used exclusively by carpools, vanpools, buses or any vehicle that transports multiple passengers.

High Speed Rail - Also known as Regional High Speed Rail, intercity passenger rail service with higher operating speeds (up to 150 m.p.h.) and limited stops. Used to link cities more than 100 miles apart.

Higher Speed Rail - Also known as Emerging High Speed Rail, intercity passenger rail service with higher operating speeds (up to 110 m.p.h.) and limited stops. Used to link cities more than 100 miles apart.

Highway Trust Fund (HTF) - Federal transportation fund that generates revenue from the federal gasoline excise tax.

Hours of Delay - The aggregate time lost by all travelers in the region on all facilities due to congestion, as measured by the time to reach destinations at posted speed limits versus traveling at a slower congested speed.

Infill Development - Projects that use vacant or underutilized land in areas that were previously developed.

Infrastructure - The physical structure of a community, such as roads, sidewalks, sewers, rail lines, and bridges.

Interagency Consultation Group (ICG) - A group involving the MPO, State and local air quality planning agencies, State and local

transportation agencies, EPA, and USDOT for the purpose of overseeing the air quality conformity process.

Intercity Passenger Rail - Also known as Conventional Passenger Rail, passenger rail service with operating speeds up to 79 m.p.h. and limited stops. Used to link cities more than 100 miles apart.

Intermodal – Accommodation of, or interconnection between various transportation modes for the movement of people and goods. In Hampton Roads, freight related accommodations or interconnections are associated with this term.

Intelligent Transportation Systems (ITS) - The application of advanced technology to current transportation problems, including incident detection, signal coordination, real-time information, and other technology.

Jurisdiction - An entity, such as counties and cities, with the power, right, or authority to interpret and apply the law. As appropriate, the term "jurisdiction" also includes federal and state agencies and federally recognized tribes.

Land Use – Activities and structures on the land, such as housing, shopping centers, farms, and office buildings.

Lane-mile - The length of a roadway segment multiplied by the number of lanes. A one-mile long, four-lane wide roadway segment would comprise four lane-miles.

Level-of-Service Standard (LOS) - A mechanism using letter grades from A to F used to determine if a given facility or service is operating efficiently.

Light Rail - An electric powered rail transit system that can operate on a variety of rights-of-way, ranging from mixed traffic on-street to fully grade separated. Generally characterized by narrow station spacing (every ½ to 1 mile), slow average operating speeds, and short train units.

Linguistically-Isolated Households - Also known as Limited English Proficient (LEP), households in which a language other than English is predominately spoken, and English proficiency is limited.

Long-Range Transportation Plan (LRTP) – A blueprint to guide the region's transportation for the next 20+ years. Federal law requires the LRTP to be updated every four years (in areas that do not meet air quality standards) to ensure that the plan remains current and effective at achieving the goals.

Low-Income Household - Households with incomes at or below 200% of the poverty level.

Maintenance Area - Any geographic region of the United States previously designated nonattainment per their air quality, and re-designated as in attainment with a plan to maintain and improve regional air quality.

Medical/Functional Needs Population - Persons with medical/functional needs are individuals with a physical or mental limitations that substantially limits one or more of the major life activities such as caring for one's self, performing manual tasks, walking, seeing, hearing, speaking, breathing, learning, and working.

Metropolitan Planning Organization (MPO) – The organization required by the federal government, designated by states, and operated by local officials for developing transportation programs in urban areas of 50,000 or more people. The MPO for our region is the HRTPO.

Metropolitan Statistical Area (MSA) - Geographical region designated by the U.S. Office of Management and Budget, with a relatively high population density at its core and close economic ties throughout the area. Used for statistical purposes only.

Mixed-Use Development - Projects or districts that include residential, commercial, and business accommodations. Vertical mixed-use development refers to buildings that have multiple uses in a single structure, such as ground floor retail, offices, and residences. Horizontal mixed-use development refers to districts where zoning allows for different uses to be in adjacent buildings and complexes.

Mobility – The movement of people or goods throughout our communities and across the region. Mobility is measured in terms of travel time, comfort, convenience, safety and cost.

Mobility Odds Factor - Factor that determines the likelihood of one's mobility, based on access to a transit stop and proximity to activity centers.

Mode- A particular form of travel (e.g., walking, bicycling, driving alone, carpooling or vanpooling, bus, train, ferry, or airplane).

Mode Split - A term that describes the relative number of people using various forms or modes of transportation. Frequently used to describe the percentage of people using private automobiles as opposed to the percentage using transit.

Multimodal - Accommodation or interconnection of various transportation modes for the movement of people and goods.

National Ambient Air Quality Standards (NAAQS) - Federal standards that set allowable concentrations and exposure limits for various pollutants. The EPA develops the standards in response to a requirement of the CAA.

National Environmental Policy Act of 1969 (NEPA) - U.S. environmental law that requires all federal agencies and their funding programs to prepare documentation containing statements of the environmental effects of proposed federal agency actions.

National Highway Construction Cost Index (NHCCI) - Price index that can be used both to track price changes associated with highway construction costs, and to convert current dollar expenditures on highway construction to real or constant dollar expenditures.

National Highway System (NHS) - Network of strategic highways within the United States, including the Interstate Highway System and other roads serving major airports, ports, rail or truck terminals, railway stations, pipeline terminals and other strategic transport facilities.

Network Gap - A missing connection to the connectivity of the transportation system.

Nonattainment Area - Any geographic area that has not met the requirements for clean air as set out in the Clean Air Act of 1990.

Non-motorized - Generally referring to bicycle, pedestrian and other modes of transportation not involving a motor vehicle.

Operating Costs - The sum of all recurring costs (e.g., labor, fuel) that can be associated with the operation and maintenance of a transportation system during a given period.

Ozone - An air pollutant that is a toxic, colorless gas which is the product of the reaction of hydrocarbons (HC) and oxides of nitrogen (NOx) in the presence of sunlight in the atmosphere. Automobile emissions are a primary source of the precursors of ozone.

Paratransit - Transit service that is scheduled or dispatched upon demand, providing "point-to-point" travel. Normally used in specialized applications with user eligibility limitations (e.g., elderly and/or handicapped) or where demand is not sufficient to support fixed route service.

Park-and-Ride - A system that provides parking for suburban commuters at an outlying terminus of a bus or rail line.

Peak Hour - Time of day during which congestion on each component of the transportation network is at its highest.

Peak Travel Period - The period of the day during which the maximum amount of travel occurs. It may be specified as the morning (A.M.) or afternoon or evening (P.M.) peak. Generally from 6–9 a.m., 4–7 p.m.

Performance Monitoring - A process of comparing actual performance against policies set by the planning process. It includes conducting the data collection and calculation procedures, and reporting the results on a specified regular and ongoing basis.

Person Trip - Trip made by a person from one location to another whether as a driver, passenger or pedestrian.

Preliminary Engineering - Analysis and design work to produce construction plans, specifications and cost estimates.

Preservation - Involves the timely application of carefully selected treatments to maintain or extend an asset's service life.

Pricing - A strategy for charging users of transportation systems. It may be used to manage demand for the facility, cover costs, and/or achieve other policy objectives.

Prioritization - The process to identify an order to fund transportation investments, based on criteria measuring the project against desired goals.

Producer Price Index (PPI) - An index that measures the average change over time in the selling prices of materials.

Public Participation Plan (PPP) - A guide for citizens to understand HRTPO's public participation approach and how one might become involved in shaping the future of transportation in Hampton Roads.

Public Private Partnership (P3) - Contractual agreement between a public agency and a private sector entity that allows for greater private sector participation in the delivery and financing of transportation projects.

Public Private Transportation Act of 1995 (PPTA) - Virginia's legislative framework authorizing private entities to enter into agreements with state, local governments, and other public entities to construct, improve, maintain, and operate transportation facilities.

Public Transportation - Regular transportation service by bus, rail, paratransit, van, airplane or ship, offered by a public sector operator.

Ramp Metering - Traffic signal control on an entry ramp to a freeway for regulating vehicle access.

Record of Decision (ROD) - Public document that signals formal federal approval of an Environmental Impact Statement (EIS) or Environmental Assessment (EA) concerning a proposed transportation project.

Regional Performance Measures - The set of evidence that shows progress toward, movement away from, or static state in policy implementation or policy achievement. A quantitative measure of how well an activity, task or function is being performed. In transportation systems, it is usually computed by relating a measure of service output/use to a measure of service input/cost.

Regional Surface Transportation Program (RSTP) - Federal funds designated to an MPO by the Surface Transportation Program.

Ridesharing - A process by which people who are interested in carpooling or vanpooling are linked with others based on the origin and destination of their commutes.

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) - The federal surface transportation program for highways, highway safety, and transit for the five-year period between 2005-2009. The core provisions of the program address safety, equity, innovative finance, congestion relief, mobility, efficiency, environmental stewardship, and environmental streamlining. The program authorizes $284 billion of federal funding through 2009. Without a more current transportation program, SAFETEA-LU has been repeatedly extended, currently through March of 2012 at the time of this publication.

Single-Occupant Vehicle (SOV) - A motor vehicle occupied by the driver only.

Six Year Improvement Program (SYIP) - The Commonwealth Transportation Board's (CTB) program for allocating funding for rail, public transportation, commuter assistance, bicycle, pedestrian, interstate and primary highway transportation projects over the next six years.

State Implementation Plan (SIP) - A blueprint of how nonattainment areas will meet national ambient air quality standards. Under federal law, the LRTP must conform to the SIP.

Strategic Highway Network (STRAHNET) - A network of highways that are important to the United States' strategic defense policy and which provide access, continuity and emergency capabilities for defense purposes. STRAHNET includes both Interstate highways as well as other non-Interstate primary routes leading into and out of strategic locations.

Strategic Rail Corridor Network (STRACNET) - An interconnected and continuous rail network critical for movement of essential military equipment to ports as well as defense installations located around the country.

Structurally Deficient - Structures with elements that need to be monitored and/or repaired. Structurally deficient bridges typically require maintenance and repair and eventually need to be rehabilitated or replaced to address deficiencies. Structurally deficient bridges, however, are not necessarily unsafe, and bridge inspectors will close or impose limits on any bridge that is unsafe.

Surface Transportation Program (STP) - Federal program provides flexible funding that may be used by States and localities for federally-funded transportation projects.

Sustainability - Sustainability is commonly defined as "meeting the needs of the present without compromising the ability of future generations to meet their own needs." Encompasses environmental, economic, social and institutional factors.

System Management - Increasing travel flow on existing facilities through improvements such as ramp metering, signal synchronization, and removal of on-street parking. Improvements typically have a low

capital cost, require little major construction, and can be implemented in a relatively short time frame.

Telecommuting - Working from home or a satellite location by the use of an electronic linkup with a central office.

TEU - Twenty-foot equivalent unit, a unit of cargo capacity.

Title VI - Section of the Civil Rights Act of 1964 that states "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

Traffic Analysis Zone (TAZ) - Unit of geography most commonly used in conventional transportation planning models.

Traffic Signal Preemption – system that allows the normal operation of traffic lights to be taken over to allow emergency vehicles or transit to have priority right-of-way through an intersection.

Transit – Passenger service provided to the public along established routes. Paratransit is a variety of smaller, often flexibly scheduled and routed transit services serving the needs of persons that standard transit would serve with difficulty or not at all.

Transit Development Plan (TDP) - Transit operator plans that help transit operators improve their efficiency and effectiveness by identifying the need and required resources for modifying and enhancing services provided to the general public, and also helps operators effectively execute planning, funding and implementation of public transit services.

Transit-Oriented Development - The development of housing, commercial space, services, and job opportunities in close proximity to public transportation. Such development is intended to reduce dependency on automobiles, and to better link residences to jobs and services.

Transit Service Frequency - The number of times transit service is provided to a location within a period of time. Usually denoted as the number of minutes between service.

Transit Stop Coverage - The area within a set distance, that users can access transit. The standard distance is half a mile from transit stops.

Transportation Control Measure (TCM) - Project, program, or action identified in a State Implementation Plan that will aid in the elimination or reduction of the severity in the number of violations of national ambient standards.

Transportation Demand - The quantity of transportation desired by users.

Transportation Demand Management (TDM) - The concept of managing or reducing travel demand rather than increasing the supply of transportation facilities. It may include programs to shift demand from single-occupant vehicles to other modes such as transit and ridesharing, to shift demand to off-peak periods, or to eliminate demand for some trips.

Transportation Improvement Program (TIP) - The multi-year program of transportation projects for highways, transit and other modes. The Regional TIP consists of projects and programs drawn from the Long-Range Transportation Plan, as well as from local plans and the transportation programs of other agencies in the region. The state also maintains a TIP, known as the STIP (a compilation of the TIPs for the metropolitan areas, plus transportation project information for rural areas of the state).

Transportation Investment Generating Economic Recovery (TIGER) - Supplementary Discretionary Grants for a National Surface Transportation System, authorized by the American Recovery and Reinvestment Act of 2009.

Transportation Management Areas (TMA) - An area designated by the Secretary of Transportation, having an urbanized area population of over 200,000, or upon special request from the Governor and the MPO designated for the area.

Transportation Operations Center (TOC) - Operations center that uses advanced technology to monitor traffic conditions, keeping motorists informed of real-time weather and road conditions.

Transportation Trust Fund (TTF) - Virginia's transportation fund that generates revenue from the state gasoline excise tax.

Unified Planning Work Program (UPWP) – A plan, developed by HRTPO, that guides all transportation planning activities in the HRTPO region.

Vanpool - An organized ridesharing arrangement in which 7 to 15 people travel together on a regular basis in a van. The van may be publicly owned, employer owned, individually owned, leased, or owned by a third party. Expenses are shared and there is usually a regular volunteer driver. (See also carpool).

Vehicle Miles Traveled (VMT) - A measurement of the total miles traveled by all vehicles for a specified time period. For transit, the number of vehicle miles operated on a given route or line or network during a specified time period.

Vehicle Trip - Trips made by vehicles, including drivers and passengers. A bus with driver and passengers is one vehicle trip.

Visualization - Techniques that include sketches, drawings, artist renderings, physical models and maps, simulated photos, videos, computer modeled images, interactive GIS systems, GIS based scenario planning tools, photo manipulation and computer simulation to convey complex transportation plans, policies, and programs to the public.

Year of Expenditure (YOE) - A unit of cost that accounts for inflation through the development, construction, and opening of a project.

Zero-Vehicle Household - Households without access to cars

Supporting Documentation

Bicycle and Pedestrian

- VDOT State Bicycle Policy Plan
- VDOT Safe Routes to School Program
- Virginia Beach Bikeways and Trails Plan
- Isle of Wight Pedestrian and Bicycle Facilities Master Plan

Bridges and Tunnels

- Regional Bridge Study
- Elizabeth River Crossings Study

Congestion

- Hampton Roads Congestion Management Process 2010 Update

Environmental Justice

- Location of Non-Drivers in Hampton Roads
- Non-Driver Residential Locations at the Census Block Level by Vehicle Availability

Highways

- Oyster Point Transportation Study
- Holland Road Corridor Study
- North Main Street Corridor Study
- Bridge Road Corridor Study
- Nansemond Parkway Corridor Study
- Pruden Boulevard Corridor Study
- Carolina Road Report
- Route 460 Corridor Study

Intermodal

- Intermodal Management Systems: Regional Freight Study
- Traffic Impact of a Hypothetical Inland Port in Hampton Roads Study
- The Virginia Port Authority 2040 Master Plan

Land Use

- Regional Land Use Research Scan
- Regional Land Use Map Report
- Non-Driver Opportunity Analysis: The Strategic Co-Positioning of Transportation, Activity Locations, and Housing to Improve Non-Driver Mobility in Hampton Roads

Long Term Planning

- Hampton Roads 2000 & 2034 Socioeconomic Data by TAZ
- Hampton Roads 2035 Rural Long-Range Transportation Plan (Available January 2012)
- Hampton Roads 2009 Socio-Economic Data by TAZ
- Prioritization of Transportation Projects: Project Evaluation and Scoring
- VTRANS 2035 Long-Range Transportation Plan
- VDEQ State Implementation Plan

Operations

- Hampton Roads Highway Incident Management (HIM): Regional Concept for Transportation Operations (RCTO)
- Hampton Roads Regional Travel Delay Study
- Coliseum Central Special Events Management Plan Study
- Regional Safety Study – General Crash Data and Trends 2011 Update
- Hampton Roads ITS Strategic Plan

Public Involvement

- HRTPO At-a-Glance
- HRTPO Citizens Guide (Print Only)
- HRTPO Public Participation Plan
- The Present and Future of Transportation in Hampton Roads: Results of a Series of Focus Groups among Hampton Roads Residents

Rail

- Richmond/Hampton Roads Passenger Rail Project: Tier I Draft Environmental Impact Statement
- Southeast High Speed Rail: Tier I Environmental Impact Statement
- Southeast High Speed Rail: Tier II Draft Environmental Impact Statement
- Hampton Roads High-Speed and Intercity Passenger Rail: Preliminary Vision Plan
- Hampton Roads Strategic Long Term High-Speed and Intercity Passenger Rail Phase 1(B): Blueprint Study

Short Term Planning

- Hampton Roads CMAQ/RSTP Project Selection Process
- 2010 HRTPO State of Transportation
- Hampton Roads 2012-2015 Transportation Improvement Program
- Commonwealth Transportation Board 2012-2017 SYIP
- VDOT Statewide Transportation Improvement Program
- Hampton Roads Military Transportation Needs Study

Transit

- Brookings MISSED OPPORTUNITY: Transit and Jobs in Metropolitan America
- Hampton Roads Regional Transit Vision Plan
- Transit Shuttle Projects: Literature Review and Best Practices
- Williamsburg Area Transit Authority: Transit Development Plan FY 2010-2015
- Comprehensive Operations Analysis for Hampton Roads Transit
- Hampton Roads Transit: Service and Schedule Efficiency Review
- Hampton Roads Transit: Transit Development Plan FY 2012-2017

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