Hampton Roads Congestion Management Process 2020 Update

PART I – INTRODUCTION AND SYSTEM MONITORING

the heartbeat of HAMPTON ROADS TPO
TRANSPORTATION PLANNING ORGANIZATION

March 2020

T20-01

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HAMPTON ROADS
CONGESTION MANAGEMENT PROCESS

PART I – INTRODUCTION AND SYSTEM MONITORING

PREPARED BY:

the heartbeat of HAMPTON ROADS TPO
TRANSPORTATION PLANNING ORGANIZATION

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TITLE:
Hampton Roads Congestion Management Process: System Performance and Mitigation Report Part I – Introduction and System Monitoring

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ABSTRACT

As the federally designated Metropolitan Planning Organization (MPO) for the Hampton Roads region, the Hampton Roads Transportation Planning Organization (HRTPO) is required by federal legislation to develop and implement a Congestion Management Process (CMP) as an integrated part of the metropolitan transportation planning process. The Hampton Roads CMP is an on-going systematic process for managing congestion that provides information and analysis on multimodal transportation system performance and on strategies to alleviate congestion and enhance the mobility of persons and goods regionwide. During this process, HRTPO works with many stakeholders to develop these strategies and mobility options.

This Congestion Management Process Report is being released in three parts. This report – Part I – includes the Introduction and information on System Monitoring. Part II of the study will highlight System Performance, and Part III will detail Congestion Mitigation strategies.

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ACKNOWLEDGMENTS & DISCLAIMERS

Prepared in cooperation with the U.S. Department of Transportation (USDOT), Federal Highway Administration (FHWA), and Virginia Department of Transportation (VDOT). The contents of this report reflect the views of the Hampton Roads Transportation Planning Organization (HRTPO). The HRTPO 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, VDOT or Hampton Roads Planning District Commission. This report does not constitute a standard, specification, or regulation. FHWA or VDOT acceptance of this report as evidence of fulfillment of the objectives of this planning study 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.

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INTRODUCTION

As the federally designated Metropolitan Planning Organization (MPO) for the Hampton Roads region, the Hampton Roads Transportation Planning Organization (HRTPO) is required by federal legislation to develop and implement a Congestion Management Process (CMP) as an integrated part of the metropolitan transportation planning process. The Hampton Roads CMP is an on-going systematic process for managing congestion that provides information and analysis on multimodal transportation system performance and on strategies to alleviate congestion and enhance the mobility of persons and goods regionwide. During this process, HRTPO works with many stakeholders to develop these strategies and mobility options.

The Hampton Roads Congestion Management Process takes a regional approach to identify and address congestion concerns, and develops and utilizes a "toolbox" of strategies to address congested locations. All strategies – including managing demand, shifting trips to other modes, reducing travel via single occupant vehicles, improving transportation system management and operations, and finally adding roadway capacity – are considered as part of the CMP.

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 CMP builds upon more than two decades of experience in planning for congestion management, including the Congestion Management System (CMS), which was first introduced in the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). In 2005, emphasis was placed on transportation management and operations in the reauthorization of the nation's surface transportation program – Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU). The requirement for a CMP continues under the current federal surface transportation legislation – the Fixing America's Surface Transportation (FAST) Act – that was passed in 2015, but adds examples of travel demand reduction strategies for congestion management and allows MPOs to develop separate congestion management plans.

HAMPTON ROADS CONGESTION MANAGEMENT PROCESS (CMP)

The Hampton Roads CMP is an on-going systematic process for managing congestion that provides information and analysis on multimodal transportation system performance and on strategies to alleviate congestion and enhance the mobility of persons and goods regionwide.

The Hampton Roads Transportation Planning Organization began developing a Congestion Management System for the region in the early 1990s, and released the region's first CMS report in 1995. Updates to the CMS/CMP were released in 1997, 2001, 2005, 2010, and 2014. The 2010 update was the first regional report to be referenced as a "Congestion Management Process." This change was intended to encourage incorporating congestion management into the metropolitan planning process, rather than have it as a stand-alone program or system. HRTPO had viewed the Congestion Management System as an on-going process prior to 2010, so this concept was not new to the region. Hampton Roads jurisdictions have always been encouraged to utilize the CMS/CMP as a tool for developing projects for the Transportation Improvement Program (TIP) and the Long-Range Transportation Plan (LRTP).

Hampton Roads Bridge-Tunnel VDOT

REPORT CONTENTS

One of the primary components of the Congestion Management Process (CMP) is a comprehensive regional roadway congestion analysis of existing conditions, which identifies the most congested locations in the region. This report provides a thorough assessment of the roadway system in Hampton Roads for both the morning and afternoon peak periods, including levels and duration of congestion, total delay, travel time reliability, safety, and impacts to freight movement. The most congested corridors are ranked in this report based on congestion and these other criteria. Finally, congestion mitigation strategies are identified and recommended for these congested locations.

This Congestion Management Process Report is being released in three parts, as described in the box to the right:

CMP REPORT CONTENTS

PART I – INTRODUCTION AND SYSTEM MONITORING

1) **INTRODUCTION –** Contains information on Performance Management and Performance-Based Planning and Programming, the elements of a CMP, CMP goals and objectives, and how the CMP in incorporated into the regional transportation planning process.

2) **SYSTEM MONITORING –** Contains information on HRTPO's system monitoring efforts including the State of Transportation report, Annual Roadway Performance report, and regional performance measures and target setting. This section also includes information on regional roadway travel and trends, traffic volumes and characteristics at major bridges and tunnels, recently completed roadway projects, and the benefits of selected projects.

PART II – SYSTEM PERFORMANCE

3) **SYSTEM PERFORMANCE –** Includes a description of the CMP roadway network and the data used in this study, and the roadway congestion analysis.

4) **RANKING OF CMP CONGESTED CORRIDORS –** Includes a ranking of congested corridors throughout the region, and a description of the criteria used to produce the rankings.

5) **FUTURE AND ONGOING ROADWAY PROJECTS –** Describes ongoing and upcoming planned and programmed projects included in both short-term and long-term planning documents.

PART III – CONGESTION MITIGATION

6) **CONGESTION MITIGATION STRATEGIES –** Describes the tools and methods that have been and can be implemented to improve congested roadways.

7) **APPLICATION OF STRATEGIES TO CMP CONGESTED CORRIDORS –** Identifies causes of congestion and recommends improvements to the highest ranked congested freeways and arterial roadways.

8) **CONCLUSIONS/NEXT STEPS**

9) **PUBLIC INVOLVEMENT –** Describes HRTPO's public involvement efforts for this study.

10) **APPENDICES**

PERFORMANCE-BASED PLANNING AND PROGRAMMING

The Moving Ahead for Progress in the 21st Century (MAP-21) surface transportation legislation established a performance- and outcome-based program, and MAP-21 and the current Fixing America's Surface Transportation (FAST) Act legislation direct MPOs, in cooperation with the state and public transportation operators, to develop long-range transportation plans and transportation improvement programs through a performance-driven, outcome-based approach to planning.

The FAST Act also requires that the metropolitan transportation planning process shall provide for the establishment and use of a performance-based approach to transportation decisionmaking to support national goals. These national performance goals have been established in the following seven areas:

- **Safety –** To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
- **Infrastructure Condition** - To maintain the highway infrastructure asset system in a state of good repair.
- **Congestion Reduction** - To achieve a significant reduction in congestion on the National Highway System.
- **System Reliability** - To improve the efficiency of the surface transportation system.
- **Freight Movement and Economic Vitality** - To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
- **Environmental Sustainability** - To enhance the performance of the transportation system while protecting and enhancing the natural environment.
- **Reduced Project Delivery Delays** - To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

The Federal Highway Administration (FHWA) defines Performance-Based Planning and Programming (PBPP) as a system-level, data-driven process to identify strategies and investments aimed at helping to achieve desired outcomes for the region's multimodal transportation network. PBPP builds on the concept of "performance management," which is a strategic approach that uses data to support decisions that help to achieve performance goals. More specifically, PBPP involves integrating transportation performance management concepts into the existing federally-required transportation planning and programming processes such as the Long-Range Transportation Plan, Transportation Improvement Program, and the Congestion Management Process. These performance management concepts are shown below.

PERFORMANCE MANAGEMENT

Transportation Performance Management (TPM) is a strategic approach that uses system information to make investment and policy decisions to achieve national performance goals. When implemented effectively, performance management can improve project and program delivery, inform investment decisions, focus staff on leadership priorities, and provide greater transparency and accountability.

Figure 1 – Transportation Performance Management (TPM) Elements
Source: FHWA.

Performance-Based Planning and Programming (PBPP) involves using data to support long-range and short-range investment decision-making. It generally starts with creating a vision and goals for the transportation system, selecting performance measures, and using data and analysis tools to inform development of investment priorities, which are then carried forward into shorter-term investment planning and programming.

PBPP was developed to help ensure that transportation investment decisions are made based on an understanding of their contributions to meeting national goals for improving the transportation system. It should involve a range of activities and products undertaken in this case by the HRTPO, working together with other agencies, stakeholders, and the public, as part of the cooperative, continuing, and comprehensive (3C) process.

As part of PBPP, MPOs, along with states and public transportation operators, are required to establish targets for performance measures in key performance areas, and to coordinate with each other when setting these targets. States, MPOs, and transit operators are also required to monitor the transportation system using specific performance measures. These performance measures and targets are addressed in the System Monitoring section of this report.

Figure 2 – Framework for Performance-Based Planning and Programming (PBPP)
Source: FHWA.

CMP ELEMENTS

The Federal Highway Administration (FHWA) has prepared guidance to assist MPOs with preparing their Congestion Management Processes. *Congestion Management Process: A Guidebook*[1] provides information on how to create an objectives-driven, performance-based CMP, and provides several examples of good practices and effective approaches.

In the guidance, FHWA noted eight elements, or actions, that are common in successful CMPs. The CMP should assist MPOs with performing the following actions for the regional transportation system:

1. **Develop regional objectives for congestion management** - It is important to consider what the desired outcome of the CMP is and what we want to achieve. It may not be feasible or desirable to try to eliminate all congestion, and so it is important to define objectives for congestion management that achieve the desired outcome. Some MPOs also define congestion management principles, which shape how congestion is addressed from a policy perspective.

2. **Define the CMP network** - This element involves determining which components of the transportation system should be the focus, and involves defining both the geographic scope and system elements (e.g., freeways, major arterials, transit routes) that will be analyzed.

3. **Develop multimodal performance measures** - The CMP should address how congestion is defined and measured. This involves developing performance measures that will be used to measure congestion that should support regional objectives.

4. **Collect data/monitor system performance** - After performance measures are defined, data should be collected and analyzed to determine how the transportation system is performing.

5. **Analyze congestion problems and needs** - Using data and analysis techniques, the CMP should address what congestion problems are present or anticipated in the region, and what are the sources of congestion.

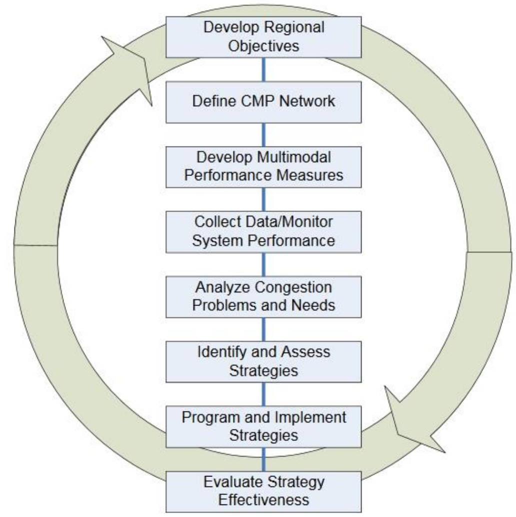


Figure 3 – Elements of the Congestion Management Process
Source: FHWA.

6. **Identify and assess strategies** - Working together with partners, the CMP should address what strategies are appropriate to mitigate congestion. This involves both identifying and assessing potential strategies, and may include efforts conducted as part of the LRTP, corridor studies, or project studies.

7. **Program and implement strategies** - This action involves answering how and when solutions will be implemented. It typically involves including strategies in the LRTP, determining funding sources, prioritizing strategies, allocating funding in the TIP, and ultimately, implementing these strategies.

8. **Evaluate strategy effectiveness** - Finally, efforts should be undertaken to assess implemented strategies. This is designed to inform future decision making about the effectiveness of transportation strategies and may be tied closely to system performance monitoring (Element 4).

All eight of these elements are included in this CMP report, and are highlighted with the corresponding numbers shown on this page.

[1] Congestion Management Process: A Guidebook, FHWA, U.S. Department of Transportation, April 2011.

INTEGRATING THE CMP INTO THE PLANNING PROCESS

Federal regulations require that CMPs be implemented as a continuous part of the metropolitan planning process, which also includes the Long-Range Transportation Plan (LRTP), the Transportation Improvement Program (TIP), and the Unified Planning Work Program (UPWP). The CMP is the first step in addressing regional congestion as it monitors the regional roadway network, identifies congestion, and develops strategies to address congestion (**Figure 4**). The CMP also includes a ranking of roadways based on current congestion and other performance measures to determine where congestion relief projects are most needed. The HRTPO encourages local planners, engineers, and decision makers to strongly consider the CMP results when developing future projects for congested areas. In addition, the most congested locations are included as candidate projects for consideration in the LRTP.

Once candidate projects are developed and submitted, data from the CMP is used in the LRTP Project Prioritization Tool (which is described later in this report) in order to assist in the ranking of projects. Finally, the highest priority projects are programmed via the TIP and the process begins again.

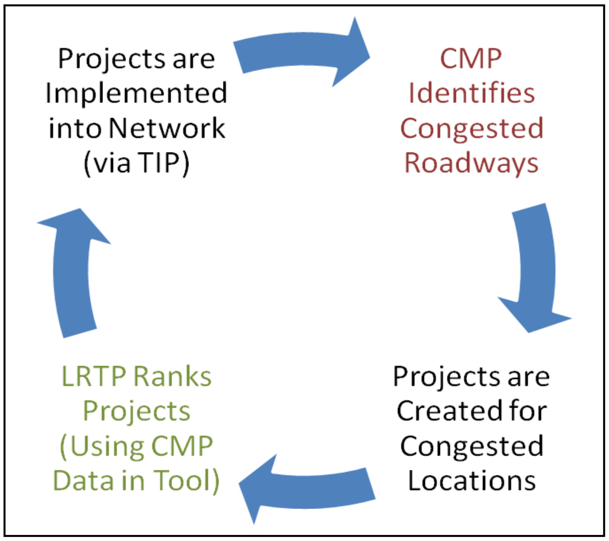


Figure 4 – Steps for Integrating the CMP into the Metropolitan Planning Process

1 CMP GOALS AND OBJECTIVES

The starting point for the CMP is the development of regional goals and objectives for congestion management. These goals and objectives should draw from and align with those in the regional Long-Range Transportation Plan (LRTP), whether they are developed specifically for the CMP, incorporated directly from the LRTP, or incorporated from other transportation planning efforts.

CMP goals and objectives define what the region wants to achieve regarding congestion management and are essential to the Performance-Based Planning and Programming (PBPP) Process. They serve as the basis for defining the direction of the CMP and the performance measures that are used in the analysis, and should assist the MPO with assessing how well actions and policies are helping to achieve its goals. These goals and objectives are typically established by the MPO's Policy Board, in coordination with MPO staff, stakeholders, and the public.

Goals and objectives are specific, measurable statements that should be regional in nature. FHWA recommends that goals and objectives be SMART – Specific, Measurable, Agreed, Realistic, and Time-bound. They should ideally focus on outcomes and generally lead to performance measures that can be monitored to assess whether or not the objective has subsequently been achieved. However, objectives in practice may start out somewhat general (such as "Improve system reliability"), but then can be revisited and made more specific, measurable, realistic, and time-bound as performance measures are defined, data is collected, congestion problems and needs are analyzed, etc.

Although CMP goals and objectives have traditionally focused on congestion-specific measures such as level of service (LOS) or vehicle delay, they can also reflect other issues that impact stakeholders and the public such as improving travel time reliability, increasing multimodal options, focusing on freight or economic development corridors, or increasing accessibility.

The current Hampton Roads LRTP – 2040 – was approved by the HRTPO Board in July 2016. Since then, the HRTPO has been working on updating the LRTP to the horizon year of 2045. As part of the 2045 LRTP update, HRTPO has prepared an LRTP vision, along with a list of goals and objectives.

The vision, goals, and objectives were developed through a collaborative effort which included outreach via stakeholder interviews, a statistically-valid public survey, a web-based survey, a workshop, and multiple

FAST ACT FEDERAL PLANNING FACTORS

1) Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
2) Increase the safety of the transportation system for motorized and non-motorized users.
3) Increase the security of the transportation system for motorized and non-motorized users.
4) Increase the accessibility and mobility of people and for freight.
5) 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.
6) Enhance the integration and connectivity of the transportation system, across and between modes, people and freight.
7) Promote efficient system management and operation.
8) Emphasize the preservation of the existing transportation system.
9) Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation.
10) Enhance travel and tourism.

stakeholder meetings. Feedback received through these efforts was compiled and reviewed to ensure consistency with local comprehensive plans and Federal and State guidelines, and was further refined with input from the LRTP Subcommittee (the subcommittee responsible for guiding the development of the LRTP).

The 2045 LRTP Vision, Goals and Objectives were approved by the Transportation Technical Advisory Committee (TTAC) and the HRTPO Policy Board in February 2020. The approaches and quantified measures to help achieve these goals and objectives will be outlined through the 2045 LRTP process.

The 2045 LRTP goals are based on the FAST Act Federal Planning Factors. The FAST Act legislation defines ten planning factors (shown on the previous page) that MPOs shall consider and implement when developing regional transportation plans and programs including long-range transportation plans. The Hampton Roads 2045 LRTP goals combine these Federal Planning Factors and focus on economic vitality, safety and security, connectivity and accessibility, sustainability, and efficiency, resiliency and innovation.

The Hampton Roads 2045 LRTP Vision Statement is shown to the right, and the goals and objectives are shown in **Figure 5** on page 9. Those goals and objectives that specifically relate to the Congestion Management Process are highlighted in red, although consideration of all of these goals and objectives should be given throughout this process.

HAMPTON ROADS 2045 LRTP VISION

The 2045 Long-Range Transportation Plan will use innovative planning techniques to advance a vision for an adaptive transportation system that seamlessly integrates transportation modes for all users, while improving quality of life and preserving the unique character of Hampton Roads.

2045 LRTP Goals	2045 LRTP Objectives
Economic Vitality	Support regional growth and productivity
	Support efficient freight movement
	Support accessibility for tourism
Safety and Security	Increase safety with an adaptive transportation system for all users, including minimizing conflicts between motorized and non-motorized modes
	Ensure the security of the region's transportation infrastructure and its users
Connectivity and Accessibility	**Increase accessibility, connectivity and mobility of people and goods**
	Provide a variety of transportation options that accommodates all users
	Increase the coordination of the transportation system, across and between modes, for people and goods
	Reduce delay and improve travel efficiency
	Improve connectivity and reliability between the Peninsula and Southside
Sustainability - The Environment, Community, and Equity	Protect and enhance the environment, promote energy conservation, and improve the quality of life
	Promote compatibility between transportation improvements and planned land use and economic development patterns
	Minimize the environmental impact of future growth and transportation
	Improve the sustainability of communities through increased housing choice and reduced auto-dependency
	Ensure that mobility benefits positively affect low income residents
	Engage a diverse public in the development of the region's transportation system
Efficiency, Resiliency, & Innovation	**Promote an efficient, reliable, and resilient regional transportation system**
	Consider the impacts of technology on system demand and performance
	Make investments that improve flood resiliency
	Preserve and maintain the existing transportation system

Figure 5 – Goals and Objectives for the Hampton Roads 2045 LRTP

Those objectives that directly relate to the Congestion Management Process are highlighted in blue, although consideration of all of these goals and objectives should be given throughout this process.

2 CMP STUDY AREA

The Hampton Roads Transportation Planning Organization serves as the Metropolitan Planning Organization (MPO) for the Hampton Roads Metropolitan Planning Area (MPA). The Hampton Roads MPA (**Map 1**) is divided by the James River and the Hampton Roads Harbor into two subregions: the Peninsula and the Southside. The Peninsula is the northern subregion, comprised of the cities of Hampton, Newport News, Poquoson, and Williamsburg, and the counties of James City and York, as well as a portion of Gloucester County. The Southside includes the cities of Chesapeake, Norfolk, Portsmouth, Suffolk, and Virginia Beach, as well as Isle of Wight County and the towns of Windsor and Smithfield. Portions of Franklin and Southampton County to the east of Route 258 are also included within the Hampton Roads MPA.

HRTPO also assists with transportation planning efforts for rural areas within the Hampton Roads Planning District Commission (HRPDC) boundary. These rural areas include all of Surry County and the portions of the City of Franklin, Gloucester County, and Southampton County outside of the MPA.

Map 1 – Hampton Roads Metropolitan Planning Area

4 SYSTEM MONITORING

HRTPO staff monitors statistics reflecting the performance of the Hampton Roads transportation network as part of its "Performance Management" planning efforts. Staff collects transportation data from a variety of sources on an ongoing basis and maintains various databases related to all facets of the regional transportation system.

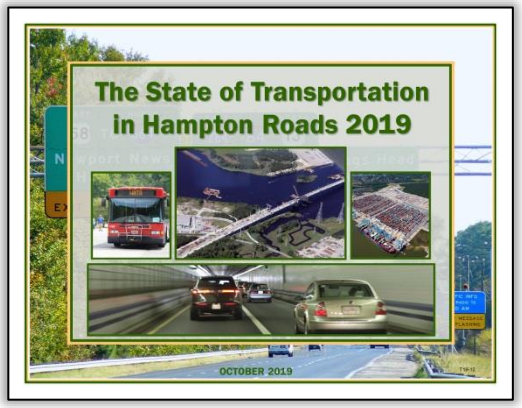
Much of the transportation data obtained by HRTPO staff is included in the CMP Database. This database serves as a "one-stop shop" for roadways included within the CMP Roadway Network (which is described further in the System Performance section of this report). The CMP Database includes existing and historical daily volumes, peak hour characteristics, roadway characteristics, INRIX travel time and speed data, congestion and travel time reliability information, daily and hourly truck volumes, and roadway safety data.

In addition, HRTPO staff also collects and monitors data related to many other transportation modes including air, rail, and marine.

More information on HRTPO's Performance Management and System Monitoring efforts is available at http://hrtpo.org/page/performance-management.

STATE OF TRANSPORTATION

HRTPO annually produces the State of Transportation in Hampton Roads report. The State of Transportation report details the current status



INFORMATION INCLUDED IN THE STATE OF TRANSPORTATION IN HAMPTON ROADS

AIR TRAVEL –

Passenger levels at regional airports
Airfares
Capacity
Nonstop destinations

RAIL TRAVEL –

Amtrak passenger levels
Rail safety

PORT DATA –

Cargo levels at the Port of Virginia
Cargo mode split

ROADWAY TRAVEL –

Regional roadway travel
Licensed drivers/registered vehicles
Regional roadway capacity
Congestion levels
Travel time reliability
Travel time to work
HOV/HOT lane usage
Commuting methods
Accessibility
Roadway safety
Bridges
Pavement condition
Truck travel
Public transportation
Transportation operations
Air quality

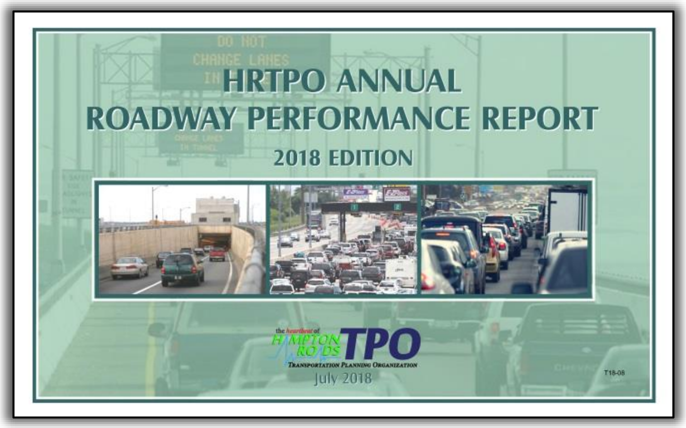
ACTIVE TRANSPORTATION (BICYCLE/PEDESTRIAN)

TRANSPORTATION FINANCING –

Transportation revenues and allocations
Fuel prices and taxes
Tolling
Roadway projects

and recent trends of all facets of the transportation system in Hampton Roads, including air, rail, water, and highways. Historical trends and new developments related to regional transportation are highlighted, and the report includes comparisons between Hampton Roads and similar large metropolitan areas throughout the United States in order to examine how various aspects of the regional transportation system are performing.

The most recent version of the State of Transportation in Hampton Roads report was released in October 2019 and is available at **http://hrtpo.org/page/state-of-transportation**.



HRTPO ANNUAL ROADWAY PERFORMANCE REPORT

As part of the Congestion Management Process, HRTPO annually prepares a report detailing the average weekday traffic volumes for major roadways in Hampton Roads. Since 2012, this document – now referred to as the HRTPO Annual Roadway Performance Report – has included an analysis of roadway speed data collected by INRIX and an analysis of peak period roadway congestion levels. The report also includes a regional summary of peak period congestion levels and an analysis of peak period travel times on a number of major corridors in Hampton Roads. Much of this analysis is similar to the analysis included in this CMP Report.

The most recent version of the HRTPO Annual Roadway Performance Report was released in July 2018 and is available at **https://www.hrtpo.org/page/traffic-data**.

REGIONAL PERFORMANCE MEASURES AND TARGETS

As part of the MAP-21 and the FAST Act federal surface transportation legislation, States and Metropolitan Planning Organizations (MPOs) are required to prepare and use a set of federally-established performance measures that are tied to the national performance goals (safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, environmental sustainability, and reduced project delivery delays) described previously in this report. States and MPOs must prepare and set targets for the federally-established performance measures in each of the areas shown to the right. In addition, these performance measures and targets must be included in planning documents such as the Hampton Roads Long-Range Transportation Plan (LRTP) and Transportation Improvement Program (TIP).

For the roadway safety and Transit Asset Management areas, targets are established for a one-year time horizon and must be set on an annual basis. For bridge condition, pavement condition, roadway performance and freight measures, MPO targets are established for a four-year time horizon. Since Hampton Roads is currently classified as an Attainment/Maintenance area for Ozone, HRTPO is not required to measure and set targets related to the Congestion Mitigation and Air Quality (CMAQ) program.

The HRTPO Board approved initial regional targets in each of these areas in 2018, based on cooperation with HRTPO staff, the Transportation Technical Advisory Committee (TTAC), and a Performance Measures Working Group established by the TTAC. This Working Group includes staff from localities, transit agencies, VDOT, and subject-matter experts. The HRTPO Board approved updated roadway safety targets in 2019 and will approve updated roadway safety and Transit Asset Management targets in 2020.

The current HRTPO regional performance targets as of December 2019 are shown in **Figure 6** on page 14.

MAP-21 REGIONAL PERFORMANCE MEASURES AREAS

ROADWAY SAFETY –

Fatalities
Fatality Rate
Serious Injuries
Serious Injury Rate
Non-motorized Fatalities and Serious Injuries

TRANSIT –

Transit Asset Management
Transit Safety (as of 2021)

BRIDGE CONDITION –

NHS Bridge Deck Area in Good Condition
NHS Bridge Deck Area in Poor Condition

PAVEMENT CONDITION –

Interstate System Pavement in Good Condition
Interstate System Pavement in Poor Condition
Non-Interstate NHS Pavement in Good Condition
Non-Interstate NHS Pavement in Poor Condition

ROADWAY PERFORMANCE –

Interstate Travel Time Reliability
Non-Interstate NHS Travel Time Reliability

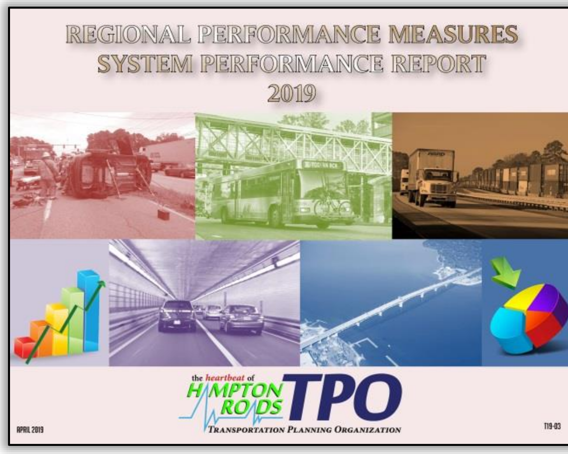
FREIGHT –

Interstate Truck Travel Time Reliability

CMAQ –

N/A for Attainment Areas

Up-to-date information on HRTPO's Federal Performance Measures effort is available at https://www.hrtpo.org/page/regional-performance-measures-and-targets. In addition, HRTPO annually prepares a System Performance Report on these regional performance measures and targets. This report includes a description of the methodology used to calculate each measure, historical data trends for each of the areas, information on statewide targets, a description of the targets that have been established by the HRTPO, and the progress being made towards meeting the established targets. The first version of the Regional Performance Measures – System Performance Report was approved by the HRTPO Board in April 2019.



Area	Measures	HRTPO Approved One-Year Target (2019)
Roadway Safety	Fatalities	137
	Fatality Rate	0.93
	Serious Injuries	1522
	Serious Injury Rate	10.32
	Non-Motorized Fatalities & Serious Injuries	194
Transit Asset Management	Rolling Stock - % of revenue vehicles within each asset class that have met or exceeded their useful life benchmark	
	Bus	< 41%
	Cutaway Buses	< 10%
	Ferry Boat	< 50%
	Light Rail Vehicles	0
	Minibus	< 20%
	Trolley Buses	< 3%
	Van	< 25%
	Equipment/Service Vehicles - % of vehicles that have met or exceeded their useful life benchmark	
	Non-Revenue/ Service Vehicles	< 92%
	Trucks & Other Rubber Tire Vehs	< 70%
	Infrastructure - % of track segments, signals, and systems with performance restrictions	
	Light Rail Infrastructure	< 3%
	Facilities - % of facilities in each asset class rated under 3.0 on FTA's TERM scale	
	Passenger/Parking	< 1%
	Maintenance	< 10%
	Administrative	< 10%

Area	Measures	HRTPO Approved Four-Year Target (2021)
Bridge Condition	NHS bridge deck area in good condition	> 20%
	NHS bridge deck area in poor condition	< 3%
Pavement Condition	Interstate System pavement in good condition	> 45%
	Interstate System pavement in poor condition	< 3%
	Non-Interstate System NHS pavement in good condition	> 25%
	Non-Interstate System NHS pavement in poor condition	< 5%
Roadway Performance	Interstate Travel Time Reliability	> 82%
	Non-Interstate NHS Travel Time Reliability	> 82.5%
Freight	Truck Travel Time Reliability Index	< 2.13

Figure 6 – HRTPO Regional Performance Measure Targets (as of December 2019)

Regional Roadway Travel and Trends

This section examines the trends in regional roadway travel levels, regional truck travel, and volumes at the bridges and tunnels that comprise a critical part of the Hampton Roads transportation network.

Regional Roadway Travel

The amount of roadway travel is measured in terms of vehicle-miles of travel (VMT), which is the total number of miles every vehicle in the region travels over a period of time. VDOT annually releases estimates of jurisdictional roadway travel levels based on traffic counts collected on a regular basis.

There were an average of 41 million vehicle-miles of travel each day in Hampton Roads in 2018 according to VDOT estimates (**Figure 7**). The amount of roadway travel in Hampton Roads has slightly increased over the last decade according to VDOT estimates. Between 2009 and 2018, there was a 1.3% increase in vehicular travel in Hampton Roads. However, roadway travel growth in the region has accelerated in recent years, with a 5.2% increase in regional roadway travel between 2014 and 2018.

Similar to Hampton Roads, both Virginia and the United States experienced a decrease in roadway travel throughout the economic downturn at the end of the last decade, but have seen increases in recent years. Between 2009 and 2018, roadway travel grew by 5.4% in Virginia and 8.3% across the country. However, roadway travel increased by 6.1% in the United States between 2014 and 2018 – reaching record high levels – and 5.4% in Virginia.

Another method of measuring the change in roadway travel is by using count stations that continuously collect traffic volume data throughout the entire year. In Hampton Roads there are approximately 80 locations equipped with continuous count stations, primarily on major roadways such as freeways and principal arterials. Based on the data collected at these

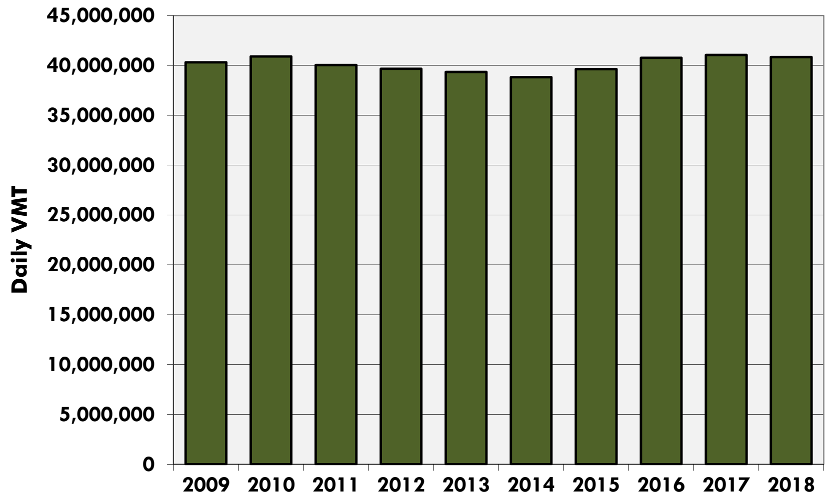


Figure 7 – Daily Vehicle-Miles of Travel in Hampton Roads, 2009-2018
Source: HRTPO analysis of VDOT estimates.

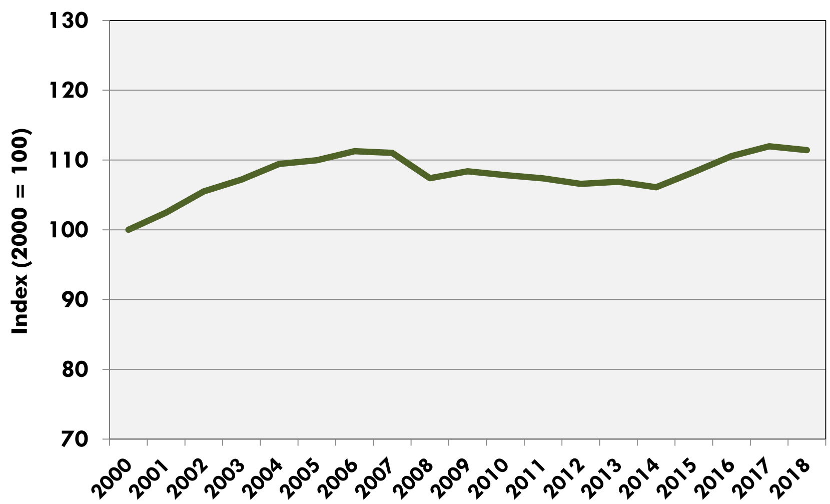
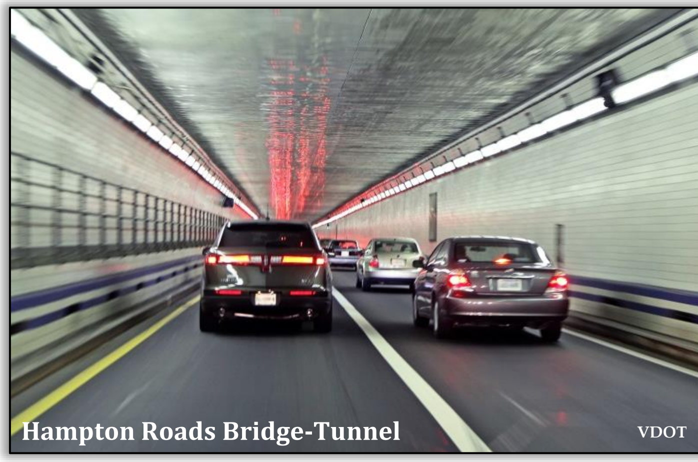


Figure 8 – Change in Regional Roadway Travel Based on Continuous Count Stations, 2000-2018
Source: HRTPO analysis of VDOT, CBBT, and various locality data.

locations, regional traffic volumes grew 11.4% between 2000 and 2018. However, after falling throughout the economic downturn and remaining largely flat earlier in this decade, regional traffic volumes increased 5.3% from 2014 to 2018. The increase in traffic volumes from 2015 to 2016 (2.1%) is the largest year-over-year increase in regional roadway travel since 2002.



Hampton Roads Bridge-Tunnel VDOT

The increase in the Hampton Roads population outpaced the growth in regional roadway travel over the last decade. This combination produced a decrease in vehicular travel per person. The vehicular travel per capita in Hampton Roads was 23.6 vehicle-miles per person per day in 2018, down 2.5% from 24.3 daily vehicle-miles per capita in 2009.

The amount of roadway travel per capita is lower in Hampton Roads than it is in similar metropolitan areas throughout the country. As shown in **Figure 9,** Hampton Roads ranked 30th highest in vehicular travel per capita among the 39 large metropolitan areas in the United States with populations between one and four million people in 2017. Nashville experienced roadway travel levels that were more than twice the levels seen in Hampton Roads, and areas such as Birmingham and Charlotte had at least 15 more miles of travel daily per capita than Hampton Roads.

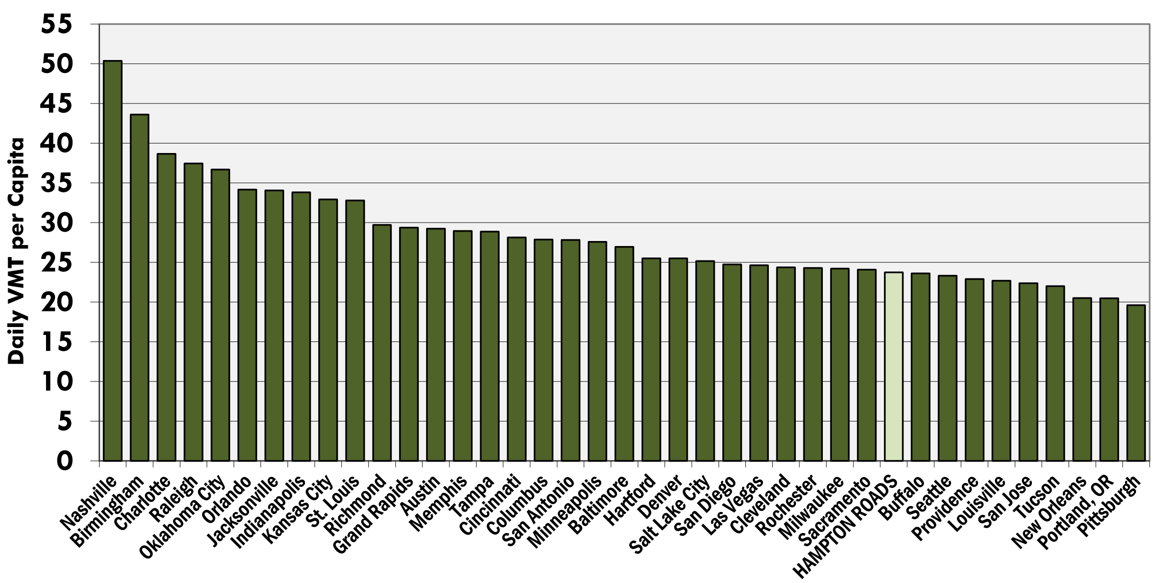


Figure 9 – Daily Vehicle-Miles of Travel per Capita in Large Metropolitan Areas, 2017

Source: FHWA. Includes all metropolitan areas with a population between one and four million people.

Truck Travel

Freight movement is a critical component of the Hampton Roads economy, and trucks are the primary mode for moving freight to and from the Port of Virginia. They also supply goods used by residents and businesses in the region.

In 2018, nearly 19,000 trucks entered or exited Hampton Roads through the Top Ten gateways each weekday (**Figure 10**). The number of trucks passing through these Hampton Roads gateways has increased each year since 2012. However, the number of trucks is still lower than the 20,000 trucks that passed through major regional gateways each weekday in 2007, prior to the start of the economic downturn.

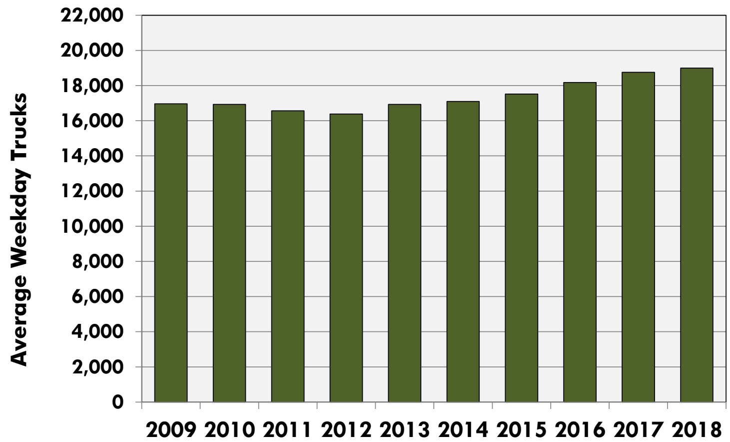


Figure 10 – Number of Trucks Passing through Hampton Roads Gateways Each Weekday, 2009-2018
Source: HRTPO analysis of VDOT and CBBT data.

The primary gateway for trucks entering or exiting Hampton Roads is I-64. An average of 6,600 trucks used I-64 to enter or exit the region each weekday in 2018, which accounted for 35% of the trucks passing through the region's major gateways. The share of trucks using I-64, however, has decreased, down from 38% in 2009. The next most heavily used gateways to the region are Route 58 (4,300 trucks each weekday in 2018) and Route 460 (2,500 trucks). Both Route 58 and Route 460 have seen an increasing share of trucks entering and exiting the region over the last decade. Combined, I-64, Route 58, and Route 460 accounted for 70% of all trucks passing through the region's major gateways in 2018.

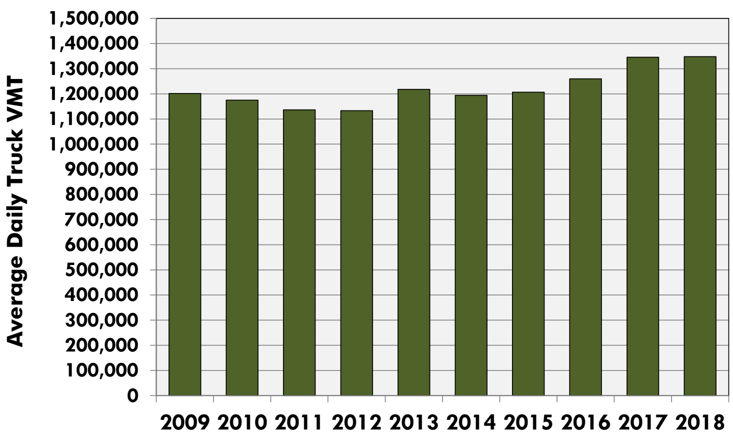


Figure 11 – Daily Truck Travel in Hampton Roads, 2009-2018
Source: HRTPO analysis of VDOT data.

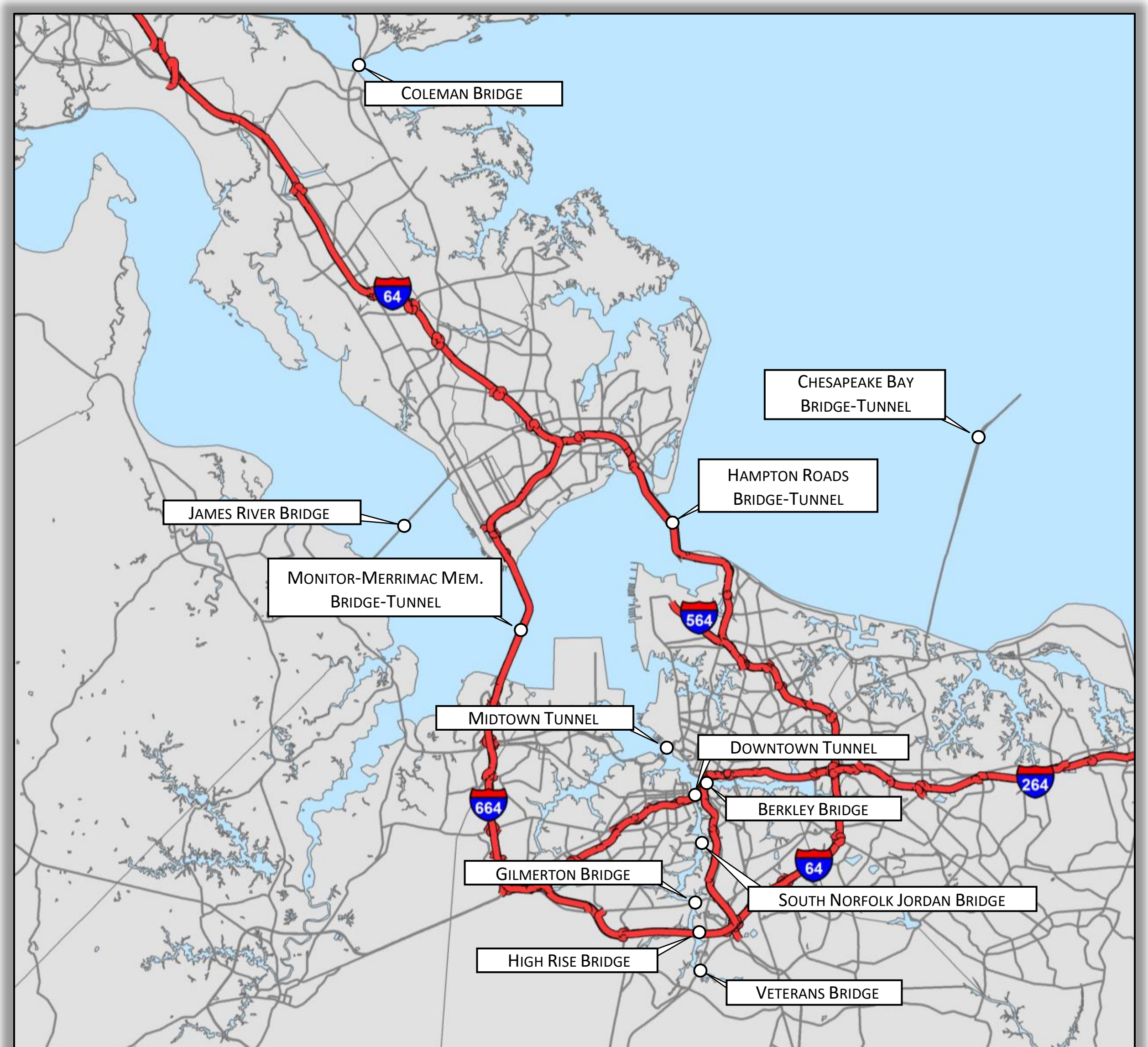
There was a total of 1.35 million miles of truck travel each day in Hampton Roads in 2018 according to VDOT estimates (**Figure 11**), which accounted for 3.3% of the 41 million vehicle-miles of travel experienced each day throughout the region. Regional truck travel levels have increased from the lows seen at the height of the economic downturn, with truck travel in Hampton Roads increasing 12% between 2009 and 2018.

More information on truck travel characteristics in the region is provided in the **Hampton Roads Regional Freight Study**, which is produced on a regular basis by the HRTPO.

BRIDGES AND TUNNELS

Bridges and tunnels are a prominent part of the Hampton Roads landscape and a critical component of the regional transportation system. Because of the importance of bridges to the transportation network and concerns about the condition and funding of bridges, HRTPO regularly prepares the Hampton Roads Regional Bridge Study. The Regional Bridge Study looks at bridge definitions, regional summaries, bridge inspections and ratings, deficient bridges, fracture and scour critical bridges, health indices, bridge funding, bridge projects, and the anticipated cost of maintaining bridges through the LRTP horizon year. Comparisons are made between the condition of bridges in Hampton Roads and those in other large metropolitan areas throughout the country. This report also includes a section detailing the new federal bridge performance measures. The Hampton Roads Regional Bridge Study – 2017 Update is available at **https://www.hrtpo.org/page/technical-reports**.

This section provides additional information on the major bridges and tunnels in Hampton Roads that cross the Hampton Roads Harbor, the Chesapeake Bay, the Southern Branch of the Elizabeth River, and the York River. A total of twelve major regional bridges/tunnels are included in this section as shown in **Map 2**.



Map 2 – Major Regional Bridges and Tunnels

Hampton Roads Harbor Crossings

Hampton Roads Bridge-Tunnel

The Hampton Roads Bridge-Tunnel (HRBT/I-64) is one of the most congested corridors in the region. The original tunnel opened to traffic in 1957, and the eastbound bridges and tunnel were added in 1976, which widened the facility from 2 to 4 lanes. The Hampton Roads Bridge-Tunnel carried just over 90,000 vehicles per weekday in 2018. Work will begin soon on widening the HRBT and the I-64 corridor to 6-8 lanes, with completion expected in late 2025.

Monitor-Merrimac Memorial Bridge-Tunnel

Connecting Newport News and Suffolk, the 4-lane Monitor-Merrimac Memorial Bridge-Tunnel (MMMBT/I-664) opened to traffic in 1992. The Monitor-Merrimac Memorial Bridge-Tunnel carried 74,000 vehicles per weekday in 2018.

James River Bridge

The James River Bridge (US Routes 17/258) spans the Hampton Roads Harbor between Newport News and Isle of Wight County. Opened in 1928, the original James River Bridge was the first fixed Hampton Roads Harbor crossing. In 1982, the aging 2-lane facility was replaced with the current 4-lane structure. The James River Bridge carried 32,000 vehicles per weekday in 2018.

Chesapeake Bay Crossing

Chesapeake Bay Bridge-Tunnel

The Chesapeake Bay Bridge-Tunnel (CBBT) connects Virginia Beach with the Eastern Shore of Virginia. The 18-mile bridge-tunnel facility was opened to traffic in 1964. In 1999, the parallel span was opened to traffic, widening the facility from 2 to 4 lanes outside of the two tunnels. Construction has recently started on a parallel tunnel at the Thimble Shoal Channel, with a parallel tunnel planned for the Chesapeake Channel by 2040. In 2018, an average of 9,000 vehicles used the CBBT each weekday, but summer weekend volumes regularly reach 25,000 vehicles per day.

Elizabeth River Crossings

Midtown Tunnel

The Midtown Tunnel (US Route 58) is a tolled, 4-lane facility that crosses underneath the Elizabeth River between the Cities of Norfolk and Portsmouth. Opened to traffic as a 2-lane facility in 1962, an additional tube was added to the Midtown Tunnel in 2016. Tolls at the Midtown Tunnel were reinstituted when construction of the parallel tube began in 2014. As of 2019 tolls are $2.20 per trip during peak periods and $1.79 during off peak periods for two-axle vehicles with E-ZPass. In 2018, an average of 38,000 vehicles used the Midtown Tunnel each weekday.


ERC

Downtown Tunnel

The Downtown Tunnel (I-264) crosses underneath the Southern Branch of the Elizabeth River between the Cities of Norfolk and Portsmouth. The original facility opened to traffic in 1952 as the first tunnel facility in Hampton Roads. A second tunnel was added in 1987, which widened the facility from two to four lanes, and the tunnel was rehabilitated in 2014. Tolls were reinstituted at the Downtown Tunnel in 2014 and are the same as the tolls charged at the Midtown Tunnel. In 2018, an average of 79,000 vehicles used the Downtown Tunnel each weekday.


HRTPO

Berkley Bridge

The Berkley Bridge (I-264) is an 8-lane drawbridge that crosses the Eastern Branch of the Elizabeth River between Downtown Norfolk and South Norfolk near the Downtown Tunnel. Opened in 1952 with the Downtown Tunnel and widened in 1991, the Berkley Bridge can be opened at 9 am, 11 am, 1 pm, and 2:30 pm on weekdays for marine traffic and on demand outside of restricted hours. The Berkley Bridge carried 101,000 vehicles per weekday in 2018.


VDOT

South Norfolk Jordan Bridge

The South Norfolk Jordan Bridge is a tolled 2-lane fixed crossing of the Southern Branch of the Elizabeth River between Chesapeake and Portsmouth. The privately-owned South Norfolk Jordan Bridge opened in 2012, replacing the original Jordan Bridge that was opened in 1928 and closed in 2008. In 2018, an average of 6,900 vehicles used the South Norfolk Jordan Bridge each weekday.


City of Chesapeake

Gilmerton Bridge

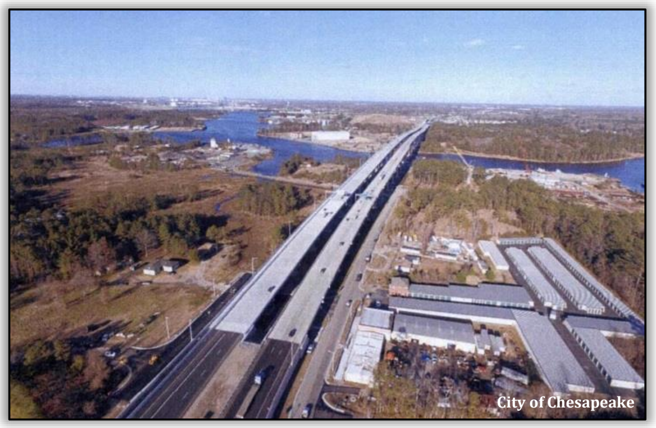
The Gilmerton Bridge (Military Highway/US Route 13) is a 4-lane vertical-lift bridge that spans the Southern Branch of the Elizabeth River in the City of Chesapeake. The Gilmerton Bridge was rebuilt and opened to traffic in 2013, replacing the original drawbridge that was opened in 1938. In 2018, an average of 39,000 vehicles used the Gilmerton Bridge each weekday.

High Rise Bridge

The High Rise Bridge (I-64) is a four-lane span over the Southern Branch of the Elizabeth River in the City of Chesapeake that opened in 1972. Although the High Rise Bridge – which carried 98,000 vehicles per weekday in 2018 – provides 65 feet of vertical clearance, the drawbridge can be opened for larger ships. Along with the Berkley Bridge, the High Rise Bridge is among only eight drawbridges on the Interstate system in the United States. Work is currently underway to construct a parallel, 100-foot high fixed span. Construction is expected to be completed in 2021.

Veterans Bridge

The Veterans Bridge (Dominion Boulevard/US Route 17) is a tolled four-lane fixed span that spans the Southern Branch of the Elizabeth River in the City of Chesapeake. The Veterans Bridge, which has 95 feet of vertical clearance, opened to traffic in 2016. The Veterans Bridge replaced the Steel Bridge, which was a two-lane drawbridge that was constructed in 1962. In 2018, an average of 27,000 vehicles used the Veterans Bridge each weekday.



York River Crossing

Coleman Bridge

The Coleman Bridge (Route 17) connects the Peninsula in York County with the Middle Peninsula in Gloucester County. The original 2-lane span was replaced with a 4-lane double-swing span in 1996. Tolls are currently $2 for two-axle vehicles or $0.85 for regular users with an EZ-Pass transponder. In 2018, an average of 35,000 vehicles used the Coleman Bridge each weekday.

Bridge/Tunnel Traffic Volumes

As mentioned previously in this report, the amount of travel on the regional roadway network has grown in recent years after largely being flat earlier in the decade. The trend at the region's major water crossings has largely been similar. **Figure 12** shows the Annual Average Daily Traffic (AADT) volumes at Hampton Roads Harbor and Elizabeth River Southern Branch crossings for the years 1990-2018.

Over 180,000 vehicles crossed the Hampton Roads Harbor each day in 2018 at one of the three crossings – the Hampton Roads Bridge-Tunnel, Monitor-Merrimac Memorial Bridge-Tunnel, and James River Bridge. The number of vehicles crossing the Hampton Roads Harbor has increased 82% since 1990, when 100,000 vehicles crossed the harbor each day. However, most of this growth occurred in the 1990s and early 2000s. This decade, volumes crossing the Hampton Roads Harbor have only increased 6%, with nearly all of this growth occurring between 2015 and 2018.

Most of the growth in volumes at the Hampton Roads Harbor crossings is from increases at the Monitor-Merrimac Memorial Bridge-Tunnel, which has experienced the most growth of any of the major bridges and tunnels. Since its opening in 1992, daily traffic volumes at the Monitor-Merrimac have grown by 179%, compared to 16% growth at the Hampton Roads Bridge-Tunnel and 32% growth at the James River Bridge.

Nearly 260,000 vehicles crossed the Southern Branch of the Elizabeth River each day in 2018 at one of the six river crossings between the Midtown Tunnel and the Veterans Bridge. The number of vehicles crossing the

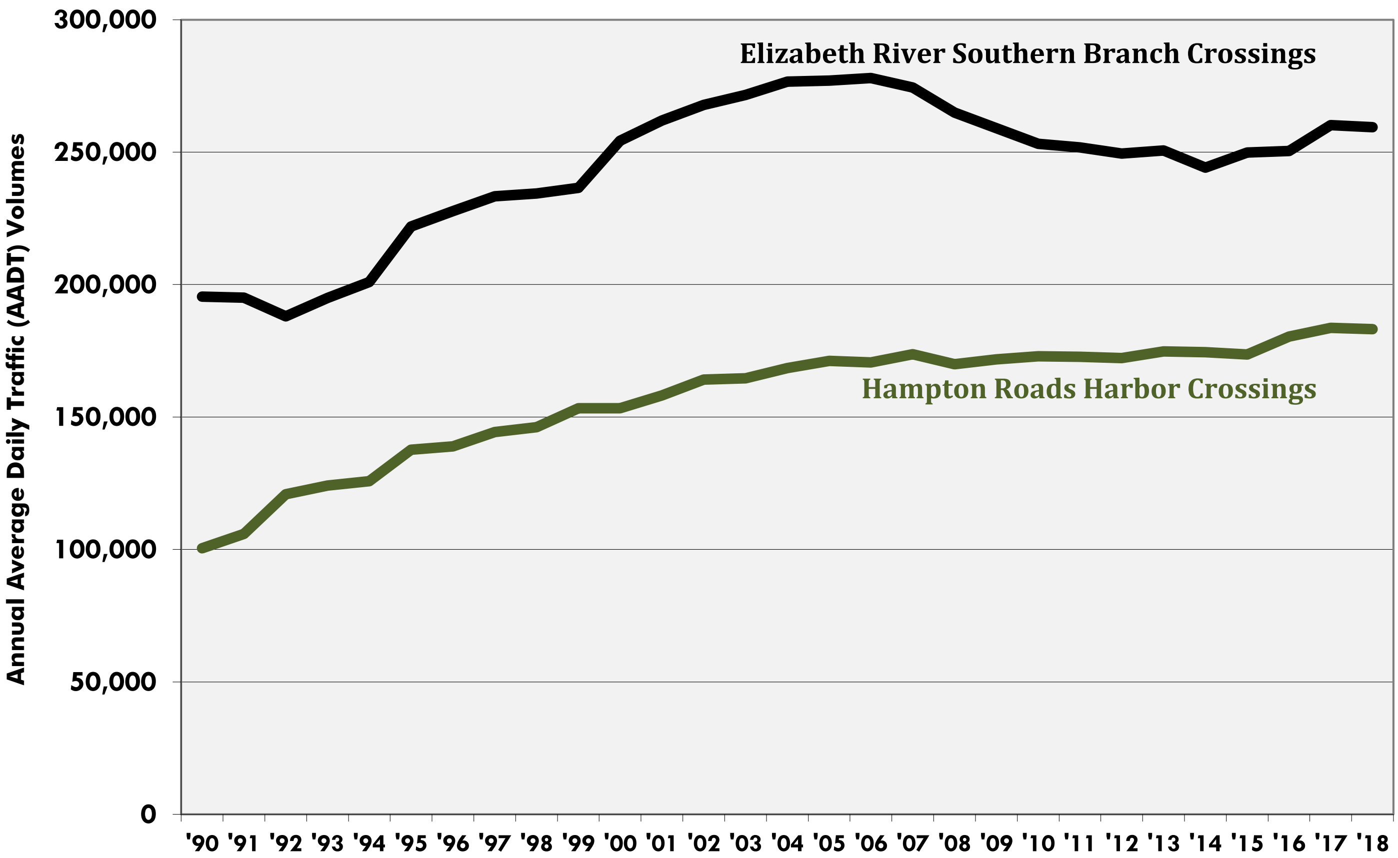
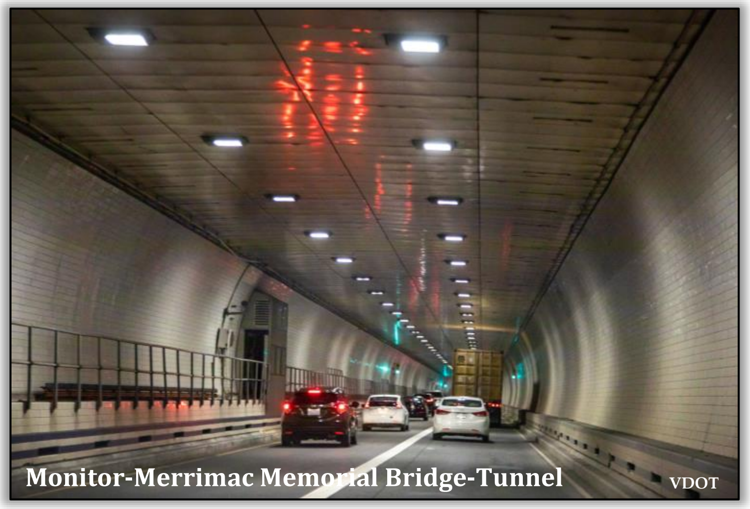


Figure 12 – Annual Average Daily Traffic Volumes Crossing the Hampton Roads Harbor and Elizabeth River Southern Branch, 1990 - 2018

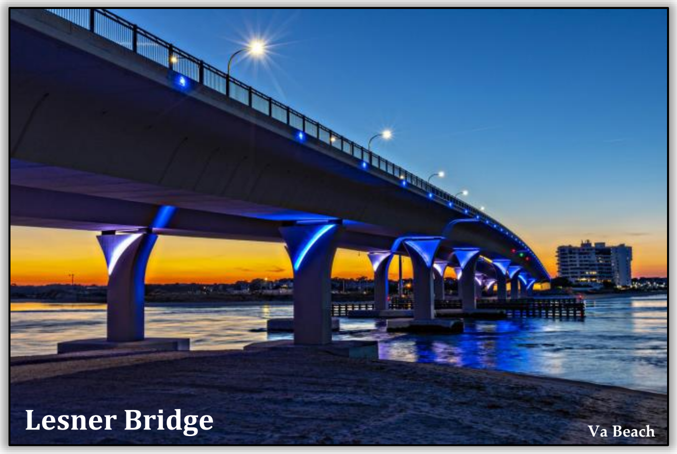
Data Sources: VDOT, SNJB, City of Chesapeake. The Hampton Roads Harbor crossings are comprised of the Hampton Roads Bridge-Tunnel, Monitor-Merrimac Memorial Bridge-Tunnel, and the James River Bridge. The Elizabeth River Southern Branch crossings are comprised of the Midtown Tunnel, Downtown Tunnel, South Norfolk Jordan Bridge, Gilmerton Bridge, High Rise Bridge, and Veterans Bridge.

Southern Branch of the Elizabeth River increased 33% from 1990 to 2018. However, volumes crossing the Elizabeth River peaked in 2006 before falling throughout the economic downturn. Volumes continued to decrease as tolls were implemented at the Midtown and Downtown Tunnels on February 1, 2014. However, volumes began increasing soon after, and volumes increased 6% between 2014 and 2018. More information on the impact of tolls at the Midtown Tunnel and Downtown Tunnel is included in the next section of this report.


Monitor-Merrimac Memorial Bridge-Tunnel VDOT

Traffic congestion and backups continue to be prevalent at many of these critical water crossings. A wide range of information regarding travel times and congestion at regional bridges and tunnels is included in the System Performance section of this report.

RECENTLY COMPLETED ROADWAY IMPROVEMENTS



As transportation funding levels have increased in Hampton Roads and throughout the Commonwealth over the last few years, a number of critical roadway projects have been completed throughout the region. This section details those major roadway projects completed in recent years and further examines the travel time benefits of a number of these projects.

A total of 47 major roadway projects were completed in Hampton Roads between 2010 and 2019 (**Figure 13** on page 25). These projects include Segments 1 and 2 of widening I-64 on the Peninsula, improving the I-64/I-264 Interchange, constructing a new interchange at I-264 and London Bridge Road, and replacing the Gilmerton, Lesner, South Norfolk Jordan Bridge, and Veterans (Steel) Bridges. New facilities have also been constructed including the Intermodal Connector, MLK Freeway Extension, City Center Boulevard, Commander Shepard Boulevard, Nimmo Parkway, and the completion of Lynnhaven Parkway. In addition, many sections of arterial roadways have been widened including Fort Eustis Boulevard, George Washington Memorial Highway, Holland Road, Jefferson Avenue, Military Highway (including a new continuous-flow intersection at Northampton Boulevard), Portsmouth Boulevard, Princess Anne Road, Warwick Boulevard, and Witchduck Road.

These 47 roadway projects were constructed at a cost of $4.7 billion. Combined, these projects added 136 lane-miles[2] to the regional roadway network.

In addition to these major roadway projects, many smaller projects have been completed throughout the region during this time. These include projects such as intersection improvements (adding or extending turn bays and adding traffic signals), installing medians, improving signage, and implementing Intelligent Transportation System (ITS) technologies such as coordinating traffic signals and travel time signage.

[2] 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.

Locality	Facility	Location	Improvement Type	Completion Date
Virginia Beach	Birdneck Road	General Booth Blvd to Norfolk Ave	Widen to 4 lanes	2010
Virginia Beach	Buckner Boulevard	Rosemont Rd and Holland Rd	New 2 lane facility	2010
Newport News	City Center Boulevard	Warwick Blvd to Jefferson Ave	New 4 lane facility	2015
Hampton	Commander Shepard Boulevard	Big Bethel Rd to North Campus Pkwy	New 4 lane facility	2014
Hampton	Commander Shepard Boulevard	North Campus Pkwy to Magruder Blvd	New 4 lane facility	2010
Virginia Beach	Constitution Drive	Bonney Rd to Columbus St	New 4 lane facility	2010
Chesapeake	Dominion Boulevard	GW Hwy to Cedar Rd	Widen to 4 lanes	2017
Chesapeake	Dominion Boulevard	Cedar Rd to Great Bridge Blvd	Widen to 4 limited-access lanes	2017
Newport News/York	Fort Eustis Boulevard	Jefferson Ave to Route 17	Widen to 4 lanes	2012
York	George Washington Mem. Highway	Hampton Hwy to Wolf Trap Rd	Widen to 6 lanes	2016
Chesapeake	George Washington Highway	Mill Creek Pkwy to Willowood Dr	Widen to 4 lanes	2012
Norfolk	Hampton Boulevard	Railroad into Norfolk International Terminals	New overpass	2015
Virginia Beach	Holland Road	Nimmo Pkwy to Dam Neck Rd	Widen to 4 lanes	2018
Norfolk	I-64	Northampton Boulevard	Interchange Improvements	2018
Norfolk	I-64	Norview Ave	Interchange Improvements	2013
James City/NN/York	I-64	Route 199 (Exit 242) to Yorktown Rd	Widen to 6 lanes	2019
Newport News	I-64	Yorktown Road to Bland Boulevard	Widen to 6 lanes	2017
Norfolk	I-64 Express Lanes	Reversible HOV lanes	Conversion to Express Lanes	2018
Virginia Beach	I-264	London Bridge Rd	New Interchange	2012
Norfolk	I-264 Eastbound	I-64 Off Ramp to I-264 Eastbound	Widening	2019
Chesapeake	I-664 Northbound	Route 13/58/460 to Dock Landing Road	Widening	2019
Norfolk	Intermodal Connector	I-564 to Naval Station Norfolk/NIT	New 4 lane facility	2018
James City/Williamsburg	Ironbound Road	Strawberry Plains Rd to Longhill Connector Rd	Widen to 4 lanes	2013
Newport News	Jefferson Avenue	Buchanan Dr to Green Grove Ln	Widen to 6 lanes	2010
Virginia Beach	Lynnhaven Parkway	Centerville Tpke to Indian River Rd	New 4 lane facility	2017
Virginia Beach	Lynnhaven Parkway	Holland Rd to South Lynnhaven Rd	Widen to 6 lanes	2010
Norfolk/Portsmouth	Midtown Tunnel	Between Portsmouth and Norfolk	Widen to 4 lanes	2017
Chesapeake	Military Highway	Gilmerton Bridge	Replace Bridge	2013
Norfolk	Military Highway	Lowery Rd to Northampton Blvd	Widen to 8 lanes	2018
Norfolk	Military Highway	Northampton Blvd/Princess Anne Rd	Intersection Improvements	2018
Norfolk	Military Highway	Northampton Blvd to Robin Hood Rd	Widen to 6 lanes	2018
Portsmouth	MLK Freeway	I-264 to High St	New 4 lane limited-access facility	2016
Suffolk	Nansemond Parkway	Shoulders Hill Rd to Chesapeake CL	Widen to 4 lanes	2018
Virginia Beach	Nimmo Parkway	Princess Anne Rd to Holland Rd	New 4 lane facility	2012
Virginia Beach	Nimmo Parkway	Holland Rd to General Booth Blvd	New 4 lane facility	2014
Chesapeake	Portsmouth Boulevard	Suffolk CL to Jolliff Rd	Widen to 4 lanes	2018
Virginia Beach	Princess Anne Road	Dam Neck Rd to Nimmo Pkwy	Widen to 4 lanes	2014
Virginia Beach	Princess Anne Road	Witchduck Rd	Intersection Improvements	2012
Southampton	Route 58	Business Route 58 East of Courtland	New interchange	2018
Hampton	Saunders Road	Newport News CL to Big Bethel Rd	Widen to 4 lanes	2016
Virginia Beach	Shore Drive	Lesner Bridge	Replace Bridge	2018
Chesapeake/Portsmouth	South Norfolk Jordan Bridge	Between Portsmouth and Chesapeake	Replace Bridge	2012
Portsmouth	Turnpike Road	Frederick Blvd to Constitution Ave	Widen to 4 lanes	2018
Norfolk	Virginia Beach Boulevard	Jett St to Military Hwy	Widen to 6 lanes	2010
Newport News	Warwick Boulevard	J Clyde Morris Blvd to Nettles Dr	Widen to 6 lanes	2010
Norfolk/Virginia Beach	Wesleyan Drive	Northampton Blvd to Baker Rd	Widen to 4 lanes	2013
Virginia Beach	Witchduck Road	Princess Anne Rd to I-264	Widen to 6 lanes	2012

Figure 13 – Major Roadway Projects Completed in Hampton Roads, 2010 – 2019

Data obtained from various sources.

8 *Benefits of Selected Completed Roadway Projects*

As described earlier in this report, one of the components of a successful Congestion Management Process is to evaluate the effectiveness of strategies. Assessing implemented strategies helps to inform future decision making about the effectiveness of transportation strategies.

The changes in travel times related to nine projects that have recently been completed are analyzed in this section. These projects include roadway widening projects, a new roadway project, intersection improvements, a rail-grade separation project, and signal timing improvements. These nine projects are:

- Midtown Tunnel/Downtown Tunnel/MLK Freeway Extension Project
- I-64 Peninsula - Segment 1
- Dominion Boulevard/Veterans Bridge
- George Washington Memorial Highway
- Military Highway Widening/CFI
- Hampton Boulevard Rail-Grade Separation
- Nimmo Parkway
- London Bridge Road/Great Neck Road Signal Retiming
- Carrollton Boulevard (Route 17) Signal Retiming

This analysis uses INRIX travel time and speed data, which is described further in the System Performance section in Part II of this report. Travel times for the corridor and parallel facilities (where applicable) are analyzed for both the year prior to the start of construction and the year 2018 (unless otherwise noted).

I-64 Peninsula - Segment 1
HRTPO

Midtown/Downtown/MLK Freeway Extension Project

The Midtown and Downtown Tunnel have been two of the most congested facilities in Hampton Roads. One of the largest projects to be completed in Hampton Roads is the Midtown Tunnel/Downtown Tunnel/MLK Freeway Extension Project. This project included the addition of a second tube at the Midtown Tunnel, the construction of an extension of the MLK Freeway from High Street to I-264, and the rehabilitation of the Downtown Tunnel and the original Midtown Tunnel.

Construction on the $2 billion project started in 2012 and tolls were implemented at the Midtown and Downtown Tunnels in order to finance the project on February 1, 2014. Rehabilitation of the Downtown Tunnel was completed in August 2016 and the MLK Freeway Extension opened in November 2016. The new tube at the Midtown Tunnel opened to traffic in June 2016, and the rehabilitation of the old tube was completed in June 2017.

After tolls were put in place in 2014, HRTPO prepared a study that looked at their impact on regional traffic patterns. The **Analyzing and Mitigating the Impact of Tolls at the Midtown and Downtown Tunnels** report included an analysis of changes in traffic volumes, queues, delays, and transit conditions, and highlighted a survey funded by the HRTPO to assess the public's views of the project. The following findings were included in the report:

- Volumes decreased at the Midtown Tunnel and Downtown Tunnel after tolls were implemented. Daily volumes decreased by 8% at the Midtown Tunnel and 20% at the Downtown Tunnel. Midday volumes decreased more (-15% at the Midtown Tunnel, -22% at the Downtown Tunnel) than the AM Peak Period (-7% at the Midtown Tunnel, -12% at the Downtown Tunnel) and PM Peak Period (-8% at the Midtown Tunnel, -8% at the Downtown Tunnel) volumes did.
- Volumes increased at the South Norfolk Jordan Bridge, Gilmerton Bridge, and High Rise Bridge after tolls were implemented at the Midtown and Downtown Tunnels. Daily volumes increased by 49% at the South Norfolk Jordan Bridge, 53% at the Gilmerton Bridge, and 7% at the High Rise Bridge. Midday volumes increased more at these three facilities than they did during the AM Peak Period and PM Peak Period.

MLK Freeway Extension VDOT

- Peak period traffic queues improved, but did not go away, for nearly all Midtown Tunnel and Downtown Tunnel approaches.
- Peak period traffic queues worsened on alternate routes, including the I-64/High Rise Bridge (AM and PM), Military Highway (PM), George Washington Highway (PM), and the South Norfolk Jordan Bridge (AM).
- In general, delay improved at tolled facilities and worsened at the parallel free routes. Peak period delays decreased greatly (-65%) after tolls were implemented at the Downtown Tunnel, and delays increased greatly (+90%) at the un-tolled Gilmerton Bridge.
- Overall, total peak period delay improved at the two tunnels by 1,826 vehicle-hours per day (-53%), and worsened at the non-tolled bridges by 243 vehicle-hours per day (+16%), an overall improvement of 1,583 vehicle-hours.
- Transit ridership remained relatively constant after tolling began and increased for Routes 45 and 47 after service time and frequency improvements were made in July 2014.

HRTPO staff is in the process of preparing a follow up study that will look at the impacts on the regional transportation network after construction was completed. The final report will be completed in 2020 and will be available on HRTPO's website at **https://www.hrtpo.org/page/technical-reports**.

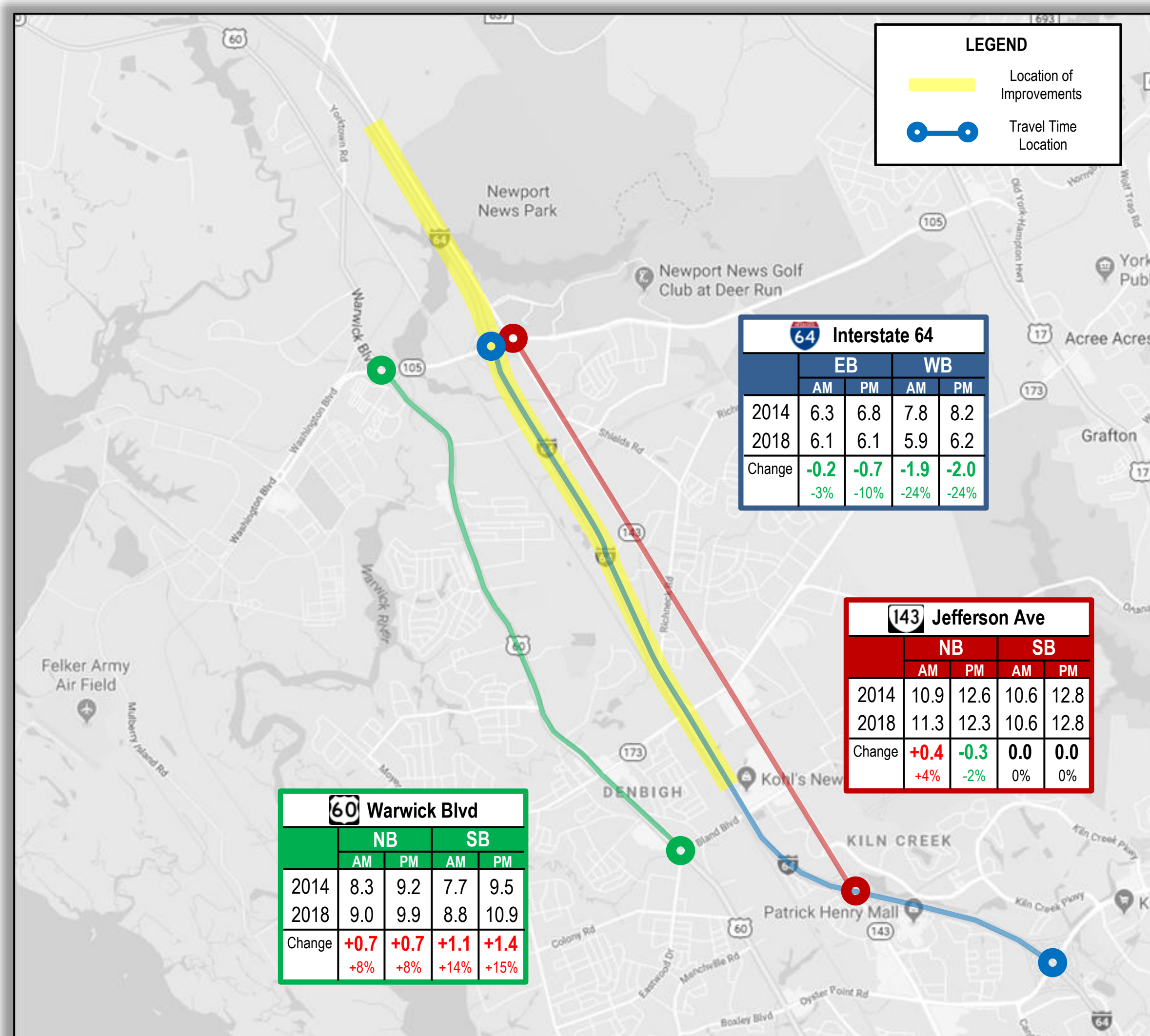
I-64 Peninsula - Segment 1

In order to alleviate congestion, I-64 is in the process of being widened for nearly 21 miles from northwest of Williamsburg (Mile Marker 233) to just west of Jefferson Avenue (Mile Marker 254). The project is being implemented in three segments. The first segment included widening I-64 from 4 to 6 lanes from just east of Yorktown Road (Exit 247) to just west of Jefferson Avenue (Exit 255). Construction on the Segment 1 widening project began in September 2015 and was completed in December 2017.

Peak period travel times improved on I-64 between Oyster Point Road and Fort Eustis Boulevard between 2014 and 2018. In 2018, the eastbound travel time was 6.1 minutes in both peak periods, down from an average of 6.3 - 6.8 minutes prior to construction in 2014. In the westbound direction, the average travel time was 5.9 - 6.2 minutes in 2018, down from 7.8 - 8.2 minutes in 2014.

In spite of the additional capacity on I-64, travel times on parallel routes did not decrease. Travel times increased by 8% on Warwick Boulevard during the morning peak period and 14 - 15% during the afternoon peak period, and travel times on Jefferson Avenue only varied between a 2% decrease and a 4% increase.

These improvements to travel times on I-64 may be an incomplete picture of the overall benefits due to construction that was occurring on Segment 2. Work continued on Segment 2 through 2018, which regularly produced backups onto the completed Segment 1.



64 Interstate 64	EB		WB	
	AM	PM	AM	PM
2014	6.3	6.8	7.8	8.2
2018	6.1	6.1	5.9	6.2
Change	-0.2 -3%	-0.7 -10%	-1.9 -24%	-2.0 -24%

143 Jefferson Ave	NB		SB	
	AM	PM	AM	PM
2014	10.9	12.6	10.6	12.8
2018	11.3	12.3	10.6	12.8
Change	+0.4 +4%	-0.3 -2%	0.0 0%	0.0 0%

60 Warwick Blvd	NB		SB	
	AM	PM	AM	PM
2014	8.3	9.2	7.7	9.5
2018	9.0	9.9	8.8	10.9
Change	+0.7 +8%	+0.7 +8%	+1.1 +14%	+1.4 +15%

Figure 14 – Pre- and Post-Widening Travel Times (in minutes) – I-64 Segment 1

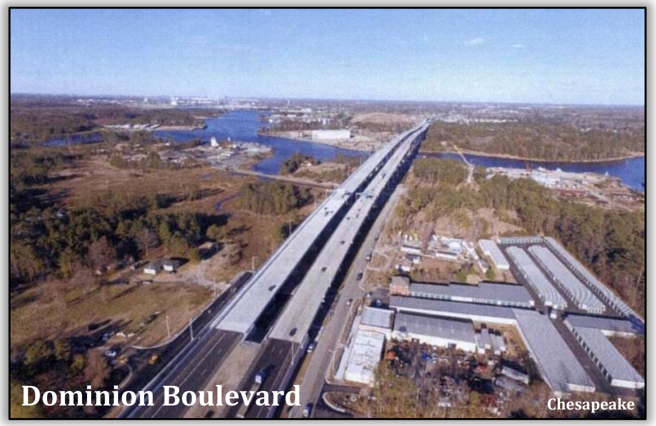
Data source: HRTPO analysis of INRIX data.
AM represents the slowest 15 minute period between 5:00 am-9:00 am. PM represents the slowest 15-minute period between 3:00pm–7:00 pm.

Dominion Boulevard/Veterans Bridge

Dominion Boulevard (US Route 17) was a two-lane roadway in the City of Chesapeake prior to 2016. The corridor included the aging Steel Bridge, a drawbridge that spanned the Southern Branch of the Elizabeth River. Backups were commonly caused by the drawbridge, which had lifts up to 6,000 times each year, or an average of 16 times each day.

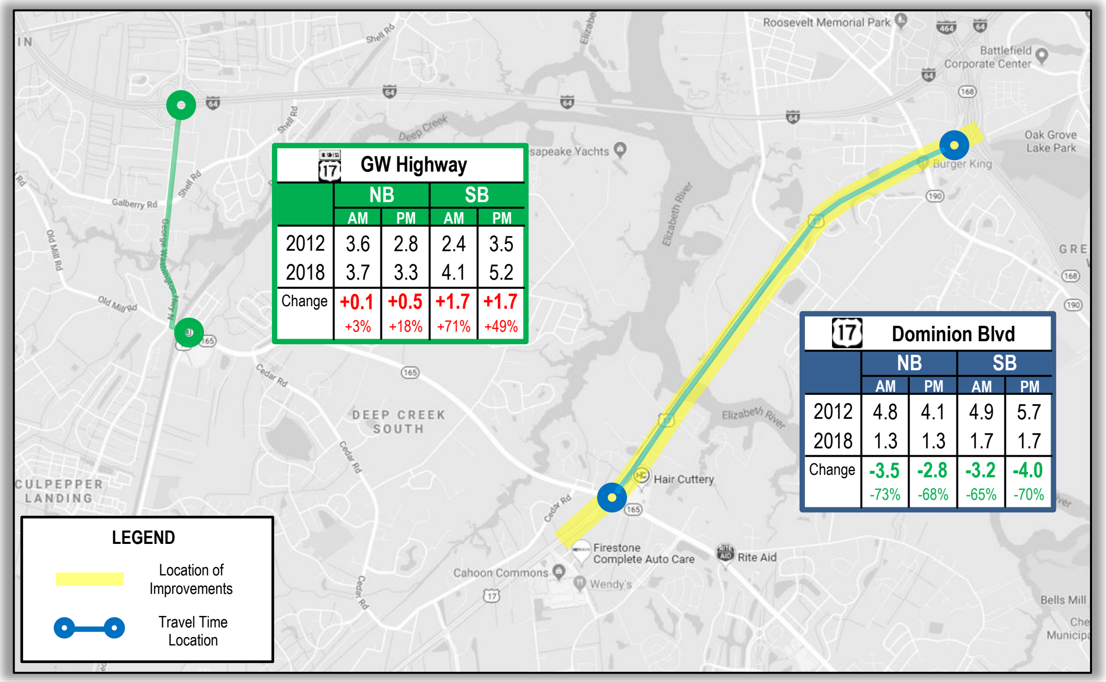
The Dominion Boulevard corridor has been improved to a 4-lane limited-access facility between Cedar Road and the I-64/I-464/Chesapeake Expressway Interchange. Construction began in January 2013 and was completed in November 2016. Tolls of $1.00 were implemented in each direction on February 9, 2017 after construction was complete.

Peak period travel times have greatly improved on Dominion Boulevard. In 2018, the northbound travel time was 1.3 minutes in both peak periods, down from an average of 4.1 - 4.8 minutes prior to construction. In the southbound direction, the average travel time was 1.7 minutes in 2018, down from 4.9 - 5.7 minutes prior to construction. These improvements only tell part of the story, however, since most bridge openings occurred outside of the peak travel periods.



Dominion Boulevard traffic volumes remain below the volumes carried prior to the project because of the tolls. The average weekday volume at the Steel Bridge was 30,400 in 2012. In 2018, the average weekday volume at the Veterans Bridge was 27,200.

Travel times on a parallel facility – George Washington Highway in Deep Creek – have not improved after the widening of Dominion Boulevard. This is largely due to capacity constraints at the Deep Creek Bridge as well as the lack of traffic volumes diverting to Dominion Boulevard due to the tolls that are in place.



17 GW Highway	NB AM	NB PM	SB AM	SB PM
2012	3.6	2.8	2.4	3.5
2018	3.7	3.3	4.1	5.2
Change	+0.1 +3%	+0.5 +18%	+1.7 +71%	+1.7 +49%

17 Dominion Blvd	NB AM	NB PM	SB AM	SB PM
2012	4.8	4.1	4.9	5.7
2018	1.3	1.3	1.7	1.7
Change	-3.5 -73%	-2.8 -68%	-3.2 -65%	-4.0 -70%

Figure 15 – Pre- and Post-Widening Travel Times (in minutes)– Dominion Boulevard/Veterans Bridge

Data source: HRTPO analysis of INRIX data.
AM represents the slowest 15 minute period between 5:00 am-9:00 am. PM represents the slowest 15-minute period between 3:00pm–7:00 pm.

George Washington Memorial Highway

George Washington Memorial Highway (US Route 17) is one of the busiest arterial corridors on the Peninsula. The segment that carries the highest volume – at 49,000 vehicles per weekday – is from Hampton Highway to Grafton Drive in York County. A 2.8-mile section of this corridor was widened from four to six lanes between Hampton Highway and Wolf Trap Road as a result of traffic congestion. Construction began in August 2013 and was completed in December 2016.

Travel times largely improved on George Washington Memorial Highway after the widening project was completed. Although average travel times increased in the northbound direction during the AM Peak Period from 2012 to 2018, they decreased by 0.8 minutes (11%) during the PM Peak Period.

In the southbound direction, travel times improved during both peak periods from 2012 to 2018. Average travel times improved by 0.7 minutes (11%) during the AM Peak Period and by 0.5 minutes (8%) during the PM Peak Period.

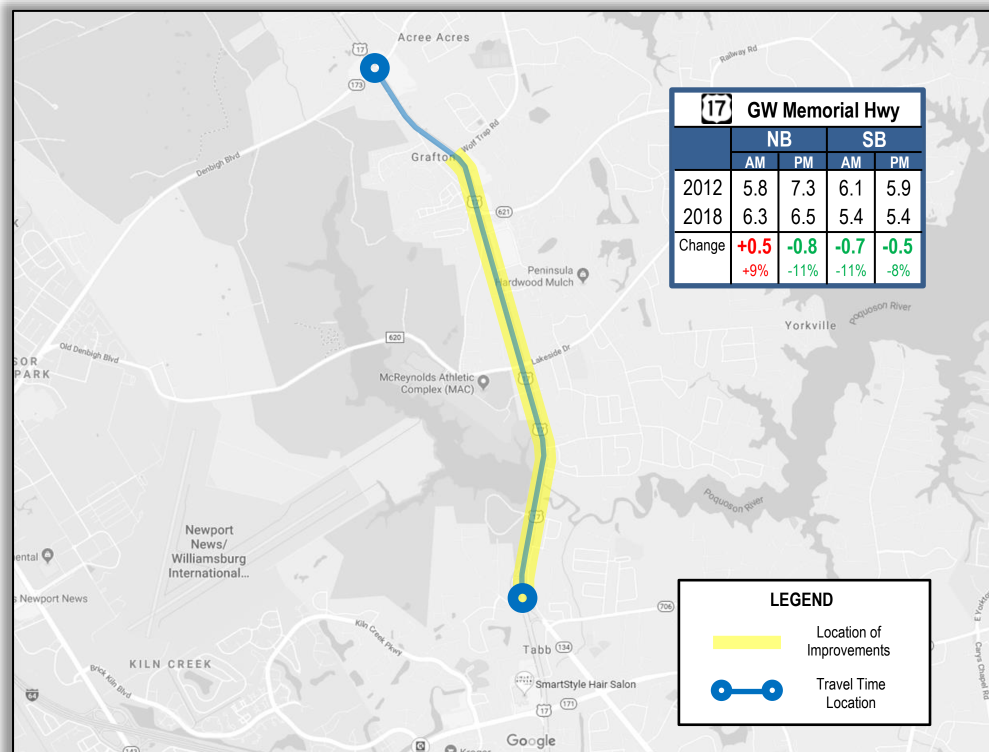


Figure 16 – Pre- and Post-Widening Travel Times (in minutes) – George Washington Mem. Highway

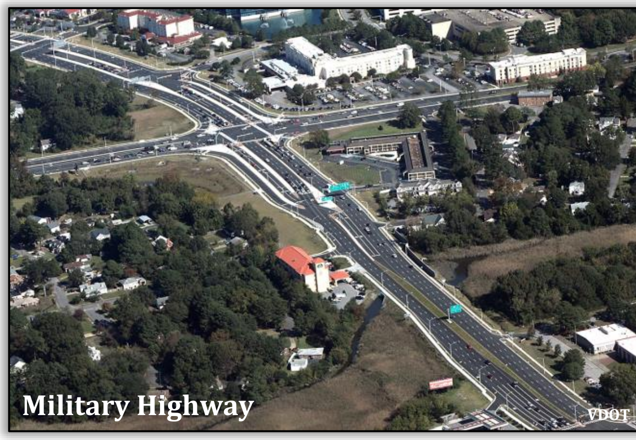
Data source: HRTPO analysis of INRIX data.
AM represents the slowest 15 minute period between 5:00 am-9:00 am. PM represents the slowest 15-minute period between 3:00pm–7:00 pm.

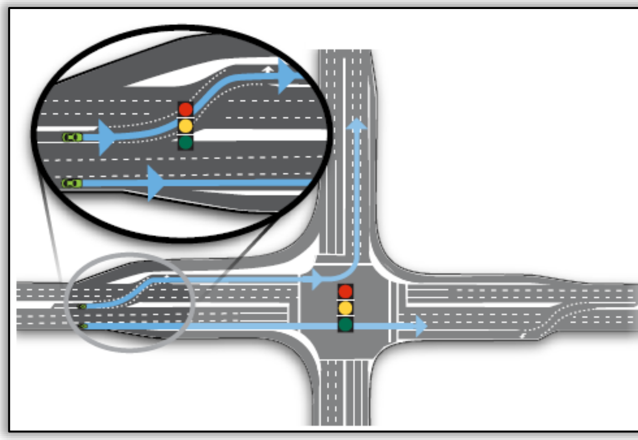
Military Highway Widening/CFI

Military Highway (US Route 13/Virginia Route 165) in the City of Norfolk was widened from four to six/eight lanes between Lowery Road and Robin Hood Road. Construction began in August 2016 and was completed in July 2018.

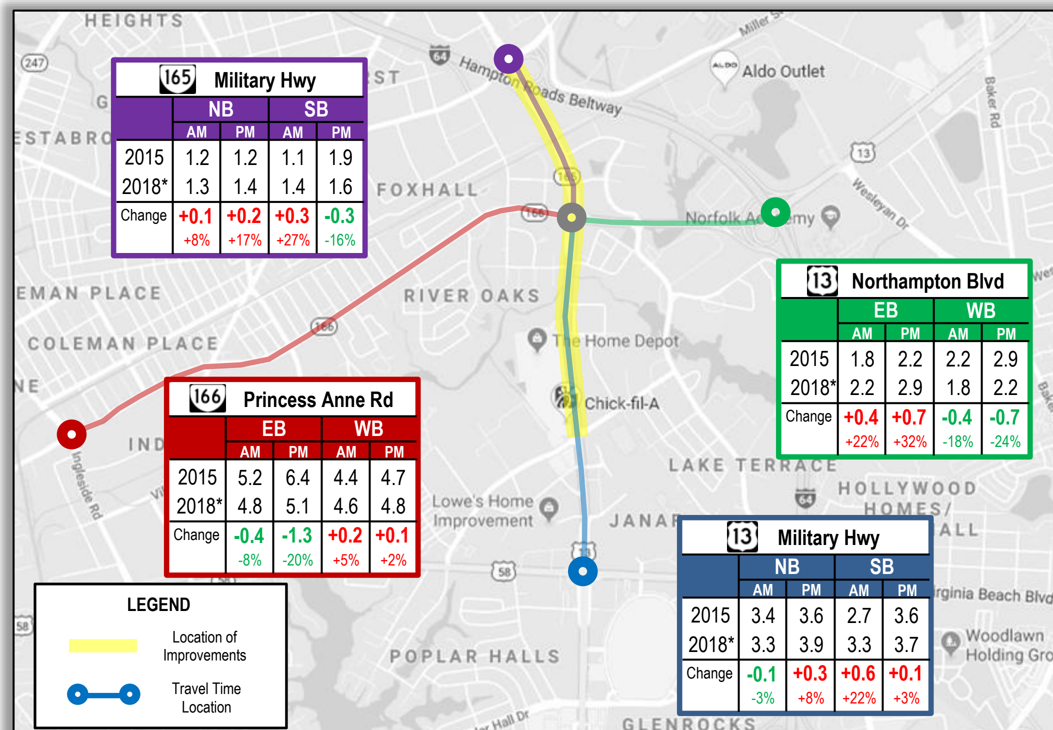
As part of the project, the intersection of Military Highway and Princess Anne Road/Northampton Boulevard was rebuilt into a continuous flow intersection (CFI). A continuous flow intersection is an at-grade, alternative intersection design that moves left-turning vehicles away from the main intersection, eliminating conflicts with opposing traffic as shown in the graphic to the right.

Travel times were analyzed for 2015 (pre-construction) and for the last five months of 2018 and first seven months of 2019 (post-construction). As shown below, travel times largely improved approaching the intersection, particularly on the Northampton Boulevard and Princess Anne Road approaches. These approaches saw decreases in travel times between 8% and 24%. Travel times for traffic approaching the intersection on Military Highway varied, with changes between -16% and +27%.





Continuous Flow Intersection Source: FHWA



165 Military Hwy

	NB AM	NB PM	SB AM	SB PM
2015	1.2	1.2	1.1	1.9
2018*	1.3	1.4	1.4	1.6
Change	+0.1 (+8%)	+0.2 (+17%)	+0.3 (+27%)	-0.3 (-16%)

13 Northampton Blvd

	EB AM	EB PM	WB AM	WB PM
2015	1.8	2.2	2.2	2.9
2018*	2.2	2.9	1.8	2.2
Change	+0.4 (+22%)	+0.7 (+32%)	-0.4 (-18%)	-0.7 (-24%)

166 Princess Anne Rd

	EB AM	EB PM	WB AM	WB PM
2015	5.2	6.4	4.4	4.7
2018*	4.8	5.1	4.6	4.8
Change	-0.4 (-8%)	-1.3 (-20%)	+0.2 (+5%)	+0.1 (+2%)

13 Military Hwy

	NB AM	NB PM	SB AM	SB PM
2015	3.4	3.6	2.7	3.6
2018*	3.3	3.9	3.3	3.7
Change	-0.1 (-3%)	+0.3 (+8%)	+0.6 (+22%)	+0.1 (+3%)

Figure 17 – Pre- and Post-Widening Travel Times (in minutes) – Military Highway Widening/CFI

Data source: HRTPO analysis of INRIX data. *2018 data includes post-construction travel times from 8/18 to 7/19.
AM represents the slowest 15 minute period between 5:00 am-9:00 am. PM represents the slowest 15-minute period between 3:00pm–7:00 pm.

Hampton Boulevard Rail-Grade Separation

Hampton Boulevard (Virginia Route 337) is a critical arterial corridor on the west side of Norfolk. The corridor spans between the Midtown Tunnel and Naval Station Norfolk and provides access to Old Dominion University, Naval Support Activity Hampton Roads, and Norfolk International Terminals (NIT). The corridor carries nearly 36,000 vehicles per weekday just north of the Midtown Tunnel and nearly 30,000 vehicles per weekday near Naval Station Norfolk.

Hampton Boulevard Grade Separation VDOT

Two railroad lines that serve Norfolk International Terminals cross Hampton Boulevard. These crossings have led to delays as trains enter and exit NIT, particularly during the middle of the day. The northern at-grade rail crossing was recently replaced with a grade-separated crossing to eliminate these delays and improve safety. Construction on the grade separation project began in 2010 and was completed in 2015.

Travel times on this section of Hampton Boulevard did not change much between 2010 and 2018. In the northbound direction, average travel times decreased by 0.4 minutes (6%) during the morning travel period but increased by 0.2 - 0.4 minutes (5 - 9%) throughout the rest of the day. In the southbound direction, travel times increased by 0.5 minutes (10%) during the morning peak period, decreased by 0.8 minutes (14%) during the afternoon peak period, and remained unchanged in the midday hours.

Although the rail-grade separation project should improve travel times and reliability on Hampton Boulevard, there are other factors that greatly impact the reliability of travel times on this corridor. Northbound travel times are greatly impacted by queues at the various gates to Naval Station Norfolk, which vary greatly based on security levels. In addition, there are still delays for trains throughout the day at the southern at-grade rail crossing at the Hampton Boulevard/Terminal Boulevard intersection.

337 Hampton Blvd

	NB			SB		
	AM	MID	PM	AM	MID	PM
2010	6.4	4.7	4.4	4.9	5.4	5.8
2018	6.0	5.1	4.6	5.4	5.4	5.0
Change	-0.4 -6%	+0.4 +9%	+0.2 +5%	+0.5 +10%	0.0 0%	-0.8 -14%

Figure 18 – Pre- and Post-Construction Travel Times (in minutes) – Hampton Boulevard Grade Separation

Data source: HRTPO analysis of INRIX data.
AM represents the slowest 15 minute period between 5:00 am-9:00 am. PM represents the slowest 15-minute period between 3:00pm–7:00 pm.

Nimmo Parkway

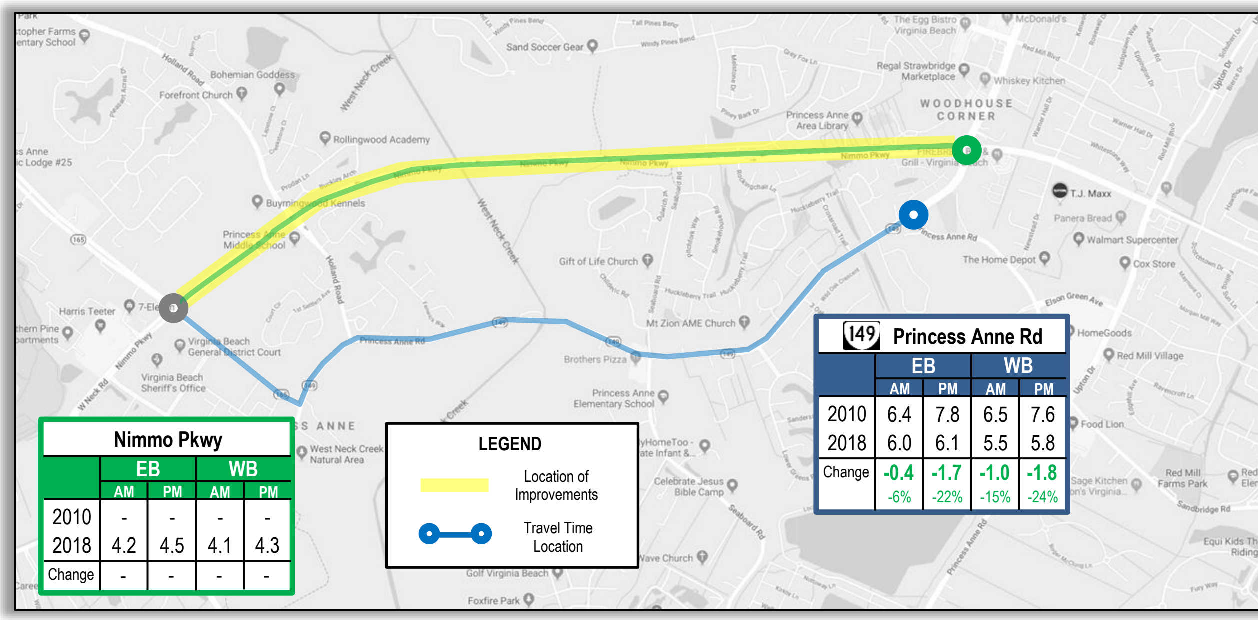
Nimmo Parkway is a new four-lane facility connecting the Courthouse and Strawbridge sections of Virginia Beach. The roadway was constructed to alleviate congestion on the two-lane Princess Anne Road, which prior to the opening of Nimmo Parkway was carrying 22,000 vehicles per weekday.

Construction on the western section of Nimmo Parkway between Princess Anne Road and Holland Road began in March 2010 and was opened in September 2012. Construction on the longer section between Holland Road and General Booth Boulevard began in December 2011 and was opened to traffic in September 2014.

Travel times greatly improved on Princess Anne Road after Nimmo Parkway opened. Average travel times decreased in the eastbound direction by 0.4 minutes (6%) during the AM Peak Period from 2010 to 2018 and decreased by 1.7 minutes (22%) during the PM Peak Period.

In the westbound direction, travel times also improved on Princess Anne Road during both peak periods from 2010 to 2018. Average travel times decreased by 1.0 minutes (15%) during the AM Peak Period and by 1.8 minutes (24%) during the PM Peak Period.

Volumes have largely diverted from Princess Anne Road to Nimmo Parkway as expected. Nimmo Parkway carried an average of 28,000 vehicles on weekdays in 2018, while volumes on Princess Anne Road were nearly cut in half, down to 12,000 vehicles per weekday.



Nimmo Pkwy

	EB AM	EB PM	WB AM	WB PM
2010	-	-	-	-
2018	4.2	4.5	4.1	4.3
Change	-	-	-	-

149 Princess Anne Rd

	EB AM	EB PM	WB AM	WB PM
2010	6.4	7.8	6.5	7.6
2018	6.0	6.1	5.5	5.8
Change	-0.4 -6%	-1.7 -22%	-1.0 -15%	-1.8 -24%

Figure 19 – Pre- and Post-Construction Travel Times (in minutes) – Nimmo Parkway

Data source: HRTPO analysis of INRIX data.
AM represents the slowest 15 minute period between 5:00 am-9:00 am. PM represents the slowest 15-minute period between 3:00pm–7:00 pm.

London Bridge Road/Great Neck Road Signal Retiming

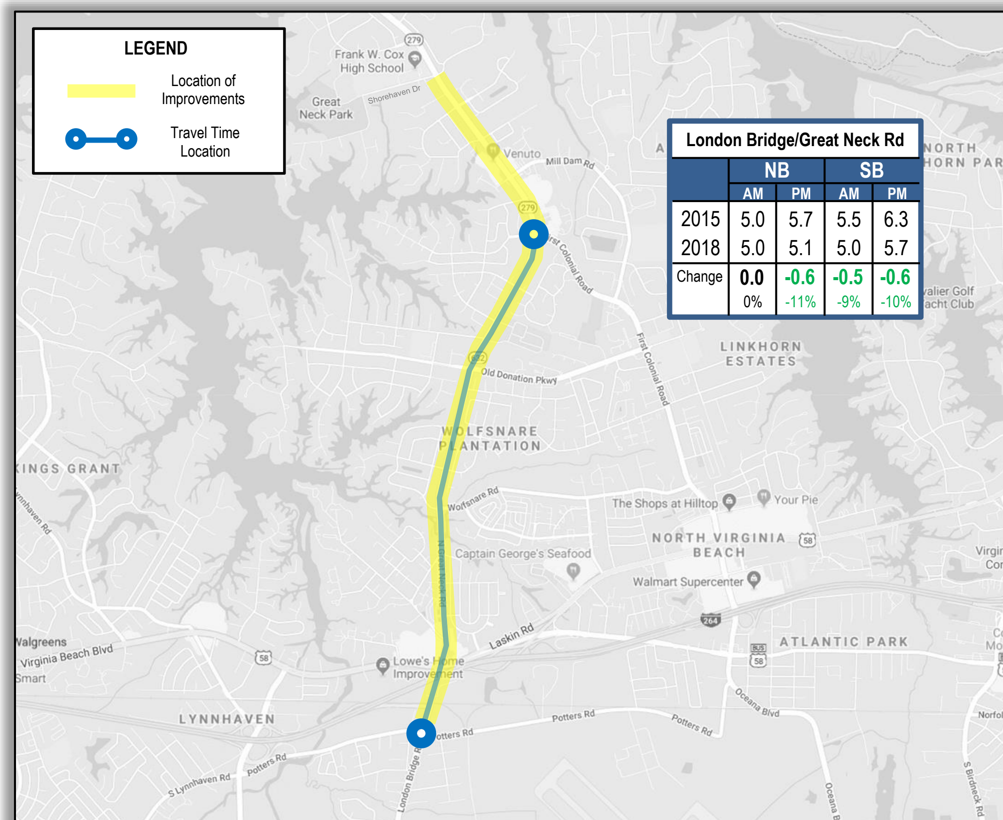
London Bridge Road/Great Neck Road is a four-lane north/south corridor in the eastern section of the City of Virginia Beach. The corridor includes numerous industrial, commercial and residential developments.

In 2012, a partial interchange was constructed at London Bridge Road and I-264, which is used by an average of 30,000 vehicles per weekday. Congestion commonly occurs on London Bridge Road in the vicinity of this interchange, largely due to adjacent signals at Potters Road and Virginia Beach Boulevard.

In order to improve the flow of traffic in this corridor and other adjacent roadways, the City of Virginia Beach implemented adaptive signal control, which adjusts signal timings dynamically based on traffic demand. This retiming took place at signalized intersections between Potters Road and Shorehaven Drive in 2016.

Travel times were improved in both directions by the signal retiming project. Although average travel times remained the same in the northbound direction during the AM Peak Period from 2015 to 2018, travel times decreased by 0.6 minutes (11%) during the PM Peak Period.

In the southbound direction, average travel times decreased by 0.5 minutes (9%) during the AM Peak Period from 2015 to 2018, and decreased by 0.6 minutes (10%) during the PM Peak Period after the retiming project.



	NB AM	NB PM	SB AM	SB PM
2015	5.0	5.7	5.5	6.3
2018	5.0	5.1	5.0	5.7
Change	0.0 0%	-0.6 -11%	-0.5 -9%	-0.6 -10%

Figure 20 – Pre- and Post-Retiming Travel Times (in minutes) – London Bridge Road/Great Neck Road

Data source: HRTPO analysis of INRIX data.
AM represents the slowest 15 minute period between 5:00 am-9:00 am. PM represents the slowest 15-minute period between 3:00pm–7:00 pm.

Carrollton Boulevard (Route 17) Signal Retiming

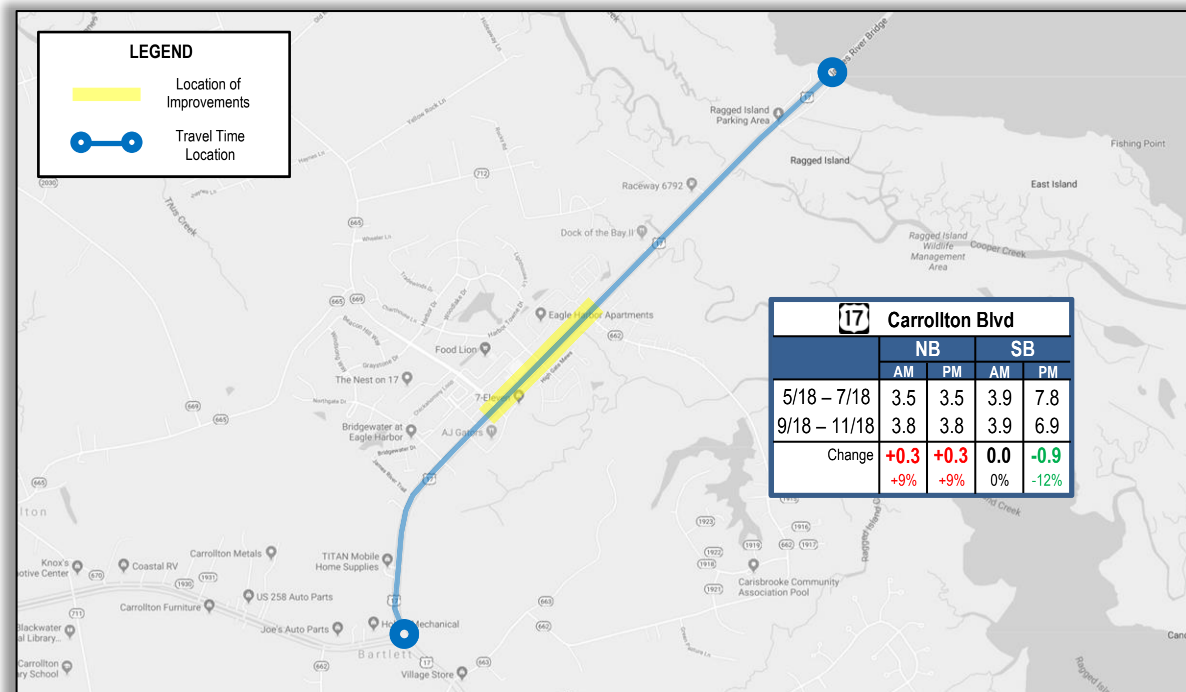
Carrollton Boulevard (Route 17) is a four-lane facility in Isle of Wight County that connects the James River Bridge with Northern Suffolk. The corridor travels through a high-growth area, with numerous commercial and residential developments recently being constructed along the corridor.

Due to complaints about traffic backups on Route 17, VDOT adjusted the timing of three traffic signals in Isle of Wight County in early August 2018 just to the south of the James River Bridge (Harbor Point Lane/Whippingham Parkway, Eagle Harbor Parkway, and Smith's Neck Road). VDOT extended the cycle length on Route 17 from 150 seconds to 200 seconds and adjusted the amount of green time allocated to Route 17.

Most of the congestion in the Route 17 corridor currently occurs in the southbound direction during the PM Peak Period, with traffic travelling from Newport News to Isle of Wight County commonly backing up onto the James River Bridge. Travel times were improved in the southbound direction by the signal retiming project. Average travel times decreased in the southbound direction by 0.9 minutes (12%) during the PM Peak Period from the three months prior to retiming (May - July 2018) compared to the three months after retiming (September – November 2018). During the AM Peak Period, travel times in the southbound direction were unchanged after the retiming.

In the northbound direction, travel times slightly increased after the signal retiming project. Average travel times increased by 0.3 minutes (9%) during both peak periods after the signal retiming. However, travel in the northbound direction remains uncongested throughout the day.

These changes in travel times do not reflect the impact that the longer cycle length has on side street delays, which is not included in the INRIX travel time dataset. In addition, travel times will likely increase again as further development occurs in the area in future years.



17 Carrollton Blvd	NB		SB	
	AM	PM	AM	PM
5/18 – 7/18	3.5	3.5	3.9	7.8
9/18 – 11/18	3.8	3.8	3.9	6.9
Change	+0.3 +9%	+0.3 +9%	0.0 0%	-0.9 -12%

Figure 21 – Pre- and Post-Retiming Travel Times (in minutes) – Carrollton Boulevard (Route 17)

Data source: HRTPO analysis of INRIX data.
AM represents the slowest 15 minute period between 5:00 am-9:00 am. PM represents the slowest 15-minute period between 3:00pm–7:00 pm.