Positioning Hampton Roads for Freight Infrastructure Funding

MAP-21 and Beyond

the heartbeat of HAMPTON ROADS TPO
Transportation Planning Organization

T14-03

March 2014

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POSITIONING HAMPTON ROADS FOR FREIGHT INFRASTRUCTURE FUNDING

MAP-21 AND BEYOND

PREPARED BY:

the *heartbeat* of HAMPTON ROADS TPO
TRANSPORTATION PLANNING ORGANIZATION

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Positioning Hampton Roads for Freight Infrastructure Funding:
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ABSTRACT

MAP-21 – considered a precursor to the next federal authorization starting FY15 – possesses a new strong freight emphasis where states, Metropolitan Planning Organizations (MPOs), and other stakeholders will all have a role. States and MPOs that are organized, with data and analyses, will be in a better position to benefit from the next authorization. At the present time, final designation of the National Freight Network has not been established.

In order to assist the State of Virginia and the United States in preparation of this effort, this study identifies a base network of highways within Hampton Roads that are anticipated to be part of the National Freight Network. It also evaluates the condition and performance of those same highways and determines freight bottlenecks and major trade gateways in order to strategically position the state and the Hampton Roads region for future freight infrastructure funding initiatives. The findings of this regional study will be forwarded to the Virginia Department of Transportation (VDOT) and the Federal Highway Administration (FHWA) in order to position Hampton Roads for future freight infrastructure funding.

ACKNOWLEDGMENTS

This document was prepared by the Hampton Roads Transportation Planning Organization (HRTPO) in cooperation with the U.S. Department of Transportation (USDOT), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), Virginia Department of Transportation (VDOT), Virginia Department of Rail and Public Transportation (DRPT), Freight Technical Advisory Committee (FTAC), 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 program 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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The HRTPO assures that no person shall, on the ground of race, color, national origin, handicap, sex, age, or income status as provided by Title VI of the Civil Rights Act of 1964 and subsequent authorities, be excluded from participation in, be denied the benefits of, or be otherwise subject to discrimination under any program or activity. The HRTPO Title VI Plan provides this assurance, information about HRTPO responsibilities, and a Discrimination Complaint Form.

TABLE OF CONTENTS

INTRODUCTION

In 2012, Congress passed and President Obama signed the Moving Ahead for Progress in the 21st Century Act (MAP-21) bill to govern United States surface transportation spending. Section 167(c) of title 23 United States Code within Section 1115 of MAP-21 [§1115; 23 USC 167] directs the Secretary to establish a National Freight Network to assist States in strategically directing resources toward improved system performance for efficient movement of freight on the highway portion of the Nation's freight transportation system. According to Section 167(g) of the title 23 US Code – as amended by MAP-21 on July 6, 2012,

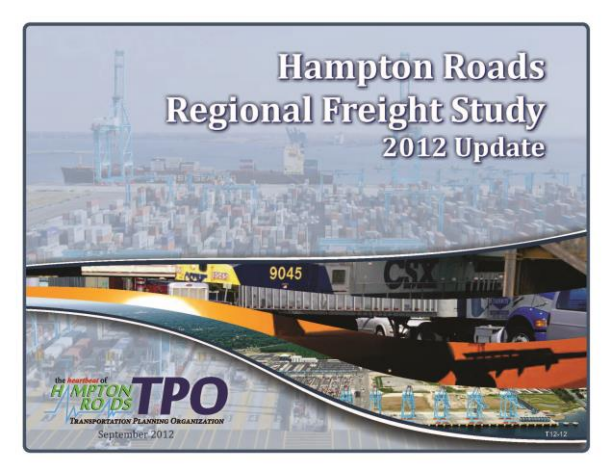
> "Not later than 2 years after the date of enactment of this section, and biennially thereafter, the Secretary shall prepare a report that contains a description of the conditions and performance of the National Freight Network in the United States."

MAP-21 – considered a precursor to the next federal authorization starting FY15 – possesses a new strong freight emphasis where states, Metropolitan Planning Organizations (MPOs), and other stakeholders will all have a role. States and MPOs that are organized, with data and analyses, will be in a better position to benefit from the next authorization. At the present time, final designation of the National Freight Network has not been established.

In order to assist the State of Virginia and the United States in preparation of this effort, this study identifies a base network of highways within Hampton Roads that are anticipated to be part of the National Freight Network. It also evaluates the condition and performance of those same highways and determines freight bottlenecks and major trade gateways in order to strategically position the state and the Hampton Roads region for future freight infrastructure funding initiatives. The findings of this regional study will be forwarded to the Virginia Department of Transportation (VDOT) and the Federal Highway Administration (FHWA) in order to position Hampton Roads for future freight infrastructure funding.

Hampton Roads Metropolitan Planning Area

Hampton Roads Regional Freight Study: 2012 Update



Recent Regional Freight Studies

Hampton Roads is a multimodal region that includes ports, airports, rail, private trucking, shipping and warehouse distribution facilities, as well as a network of road and rail corridors for the delivery of freight, goods, and services. Trucks are the primary mover within this system and are responsible for delivering a majority of what local citizens consume and use on a daily basis – groceries, gas, clothes, and medicine. The Port of Virginia conducts international trade of containerized, bulk, break-bulk, and roll-on/roll-off cargo and railroads (e.g. Norfolk Southern and CSX) transport various commodities, such as coal, automobiles, and chemicals. In order for Hampton Roads to remain competitive in attracting new business interests and continue to grow economically, its transportation network must facilitate the efficient movement of raw materials and finished products.

The Hampton Roads region recognizes the importance of planning for freight and improving system performance. Over the past two years, the Hampton Roads Transportation Planning Organization (HRTPO) staff completed the Hampton Roads Regional Freight Study[1] and the study entitled Existing and Future Truck Delay in Hampton Roads[2]. This 2013 study builds on the work contained within those two recent studies, using data and results (e.g. projected truck volumes and delays) to develop recommendations for the highway portion of the regional freight network.

MAP-21

On July 6, 2012, President Obama signed into law the Moving Ahead for Progress in the 21st Century Act (MAP-21). According to the US Department of Transportation, MAP-21 creates a streamlined, performance-based, and multimodal program to address the many challenges facing the U.S. transportation system. States are required to invest resources in projects to achieve individual targets that collectively will make progress toward national goals.

MAP-21 establishes the following national performance goals for Federal highway programs[3]:

[1] *Hampton Roads Regional Freight Study: 2012 Update*, HRTPO, September 2012.

[2] *Existing and Future Truck Delay in Hampton Roads*, HRTPO, September 2013.

[3] https://www.fhwa.dot.gov/map21/summaryinfo.cfm, as of September 2013.

Existing and Future Truck Delay in Hampton Roads (September 2013)

- **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 NHS.
- **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.

Significant MAP-21 Freight Provisions

According to US Department of Transportation's Federal Highway Administration (FHWA), MAP-21 includes a number of provisions to improve the condition and performance of the National Freight Network and support investment in freight-related surface transportation projects. This section of the report highlights some of the significant MAP-21 freight provisions contained on the FHWA website[4]:

National Freight Policy

Establishes a policy to improve the condition and performance of the National Freight Network to provide the foundation for the United States to compete in the global economy and achieve goals related to economic competitiveness and efficiency; congestion; productivity; safety, security, and resilience of freight movement; infrastructure condition; use of advanced technology; performance, innovation, competition, and accountability in the operation and maintenance of the network; and environmental impacts. [§1115; 23 USC 167]

National Freight Network

Requires DOT to establish a National Freight Network to assist States in strategically directing resources toward improved movement of freight on highways. The National Freight Network will consist of three components:

1. a Primary Freight Network (PFN), as designated by the Secretary,
2. any portions of the Interstate System not designated as part of the PFN, and
3. Critical Rural Freight Corridors.

DOT must designate the PFN within one year of enactment of MAP-21. When initially designated, the PFN may contain a maximum of 27,000 centerline miles of existing roadways that are most critical to the movement of freight. DOT may add to the PFN up to 3,000 additional centerline miles of roads critical to future efficient movement of goods on the PFN. States will designate the Critical Rural Freight Corridors using criteria contained in MAP-21 [§1115; 23 USC 167]

National Freight Strategic Plan

Directs DOT to, within three years of enactment of MAP-21, develop a national freight strategic plan in consultation with States and other stakeholders, and to update the plan every five years. The plan must –

- assess the condition and performance of the National Freight Network;
- identify highway bottlenecks that cause significant freight congestion;
- forecast freight volumes;
- identify major trade gateways and national freight corridors;
- assess barriers to improved freight transportation performance;
- identify routes providing access to energy areas;
- identify best practices for improving the performance of the National Freight Network and mitigating the impacts of freight movement on communities; and
- provide a process for addressing multistate projects and strategies to improve freight intermodal connectivity. [§1115; 23 USC 167]

Freight Data, Planning, and Reporting

Directs DOT to develop or improve data and tools to support an outcome-oriented, performance-based approach to evaluating proposed transportation projects. Directs DOT to consider improvements to existing freight flow data collection. [§1115; 23 USC 167]

Freight Conditions and Performance Report

Requires DOT to prepare a biennial report describing the condition and performance of the National Freight Network. [§1115; 23 USC 167]

Prioritization of Projects to Improve Freight Movement

Authorizes DOT to allow a maximum Federal share of 95% for an Interstate System project (or of 90% for a non-Interstate System project) if the project makes a demonstrable improvement in the efficiency of freight movement and is identified in a State freight plan (as described in section 1118 of MAP-21). [§1116]

State Freight Advisory Committees and Freight Plans

Requires DOT to encourage each State to establish a freight advisory committee composed of a representative cross-section of public- and private-sector freight stakeholders. [§1117]

[4] https://www.fhwa.dot.gov/map21/freight.cfm, as of October 2013.

Requires DOT to encourage each State to develop a comprehensive plan for its immediate and long-range freight-related planning and investment. [§1118]

Changes in Freight Eligibility Under Grant and Loan Programs

- STP: Provides eligibility for truck parking and surface transportation infrastructure improvements in port terminals for direct intermodal interchange, transfer, and port access. [§1108; 23 USC 133]
- HSIP: Offers eligibility for truck parking. [§1112; 23 USC 148]
- CMAQ: Allows use of funds for a project or program to establish electric vehicle charging stations or natural gas vehicle refueling stations. [§1113; 23 USC 149]
- Projects of National and Regional Significance (PNRS): Continues program with some changes. [§1120; SAFETEA-LU §1301]
- TIFIA: Restricts use of loans for freight rail projects to direct intermodal transfer. [§2002; 23 USC 601(a)(12)(D)(i)(I)]

Special Permits During Periods of National Emergency

Allows States to issue divisible load permits to overweight trucks exclusively carrying relief supplies for up to 120 days following a Presidential declaration of a major disaster. [§1511]

Metropolitan and Statewide Planning

Continues ability for freight shippers and providers of freight transportation services to participate in metropolitan and Statewide transportation planning processes. [§1201-1202; 23 USC 134(g)(3), 135(f)(3)]

Continues requirement that planning processes provide for consideration of projects and strategies to –

- increase the accessibility and mobility of people and for freight; and
- enhance the integration and connectivity of the transportation system, across and between modes, for people and freight. [§1201-1202; 23 USC 134(h), 135(d)]

Performance

Within 18 months of enactment, requires DOT (within a broader rulemaking on performance) to establish measures for States to use to assess freight movement on the Interstate System. [§1203; 23 USC 150(c)]

Requires each State to set performance targets in relation to these measures and integrate the targets within its planning processes. States must also report periodically on their progress in relation to the targets and on how they are addressing congestion at freight bottlenecks. [§1201, 1203; 23 USC 135(d)(2), 135(f)(7), 150(d)-(e)]

Requires each MPO to set performance targets in relation to the freight measures, integrate these targets within their planning processes, and report periodically on their progress in relation to these targets. [§1201; 23 USC 134(h)(2), 134(i)(2)(C)]

STUDY OBJECTIVES

HRTPO staff has initiated this study to address several MAP-21 freight provisions described above in order to position Hampton Roads to receive funding in the next authorization to improve freight transportation in the region. This study analyzes a base network of Hampton Roads highways that are anticipated to be part of the National Freight Network. It addresses several required elements of the National Freight Strategic Plan [the Hampton Roads portion] where data is available. Listed below are the major objectives of this study:

Study Objectives	Corresponding USDOT Product	Corresponding U.S. Code
1. Identify highways within Hampton Roads that are anticipated to be part of the MAP-21 National Freight Network.	National Freight Strategic Plan	§1115; 23 USC 167 (c)-(e)
2. Assess the condition and performance of the Hampton Roads portion of the anticipated National Freight Network for the following elements: o Congested roadways o Deficient bridges o Vertical clearances below preferred height o Inadequate lane widths o Poor pavement conditions	National Freight Strategic Plan & Freight Conditions and Performance Report	§1115; 23 USC 167 (f)(1)(A) & §1115; 23 USC 167 (g)
3. Identify highway bottlenecks that cause significant freight congestion on the anticipated highway network.	National Freight Strategic Plan	§1115; 23 USC 167 (f)(1)(B)
4. Forecast 20-year truck volumes on the anticipated highway network.	National Freight Strategic Plan	§1115; 23 USC 167 (f)(1)(C)
5. Identify major trade gateways in Hampton Roads.	National Freight Strategic Plan	§1115; 23 USC 167 (f)(1)(D)
6. Make recommendations to increase the accessibility and mobility of people and for freight.	N.A.	N.A.

Freight Network – Identification

As discussed in the previous section, the MAP-21 surface transportation bill directs the Secretary to establish a National Freight Network to assist States in strategically directing resources toward improved system performance for efficient movement of freight on the highway portion of the Nation's freight transportation system. The National Freight Network will consist of three components [§1115; 23 USC 167]:

1. a Primary Freight Network (PFN), as designated by the Secretary,
2. any portions of the Interstate System not designated as part of the PFN, and
3. Critical Rural Freight Corridors.

National Freight Network – Hampton Roads Base Network

In July 2013, HRTPO staff began working on this study to better position Hampton Roads for freight infrastructure funding. The National Freight Network (NFN) not being established[5], HRTPO staff worked with the Virginia Department of Transportation and other regional stakeholders to identify potential highways within Hampton Roads that may be included in this network. This effort focused on interstate and other highways that are critical to freight movement in the region that are likely to be included in the final national designation.

Map 1, on page 13, shows the Interstate and Non-Interstate highways as well as future roadways that are anticipated to be part of the National Freight Network in Hampton Roads. This base network consists of:

- all interstate highways
- non-interstate highways (Route 58, Route 460/Pruden Boulevard, Suffolk Bypass, Western Freeway, MLK Freeway), and
- future roadways (Commonwealth Connector – new Route 460, MLK Extension, Intermodal Connector).

This National Freight Network – Hampton Roads Base Network is used in the next section of this report to document existing conditions and deficiencies along that network. It is also used to determine freight bottlenecks, 20-year forecasted truck volumes, and major trade gateways within Hampton Roads. This effort is a starting point for meeting the national freight policy goals of MAP-21.

Trucks traveling on Western Freeway toward the Midtown Tunnel in Portsmouth, Virginia

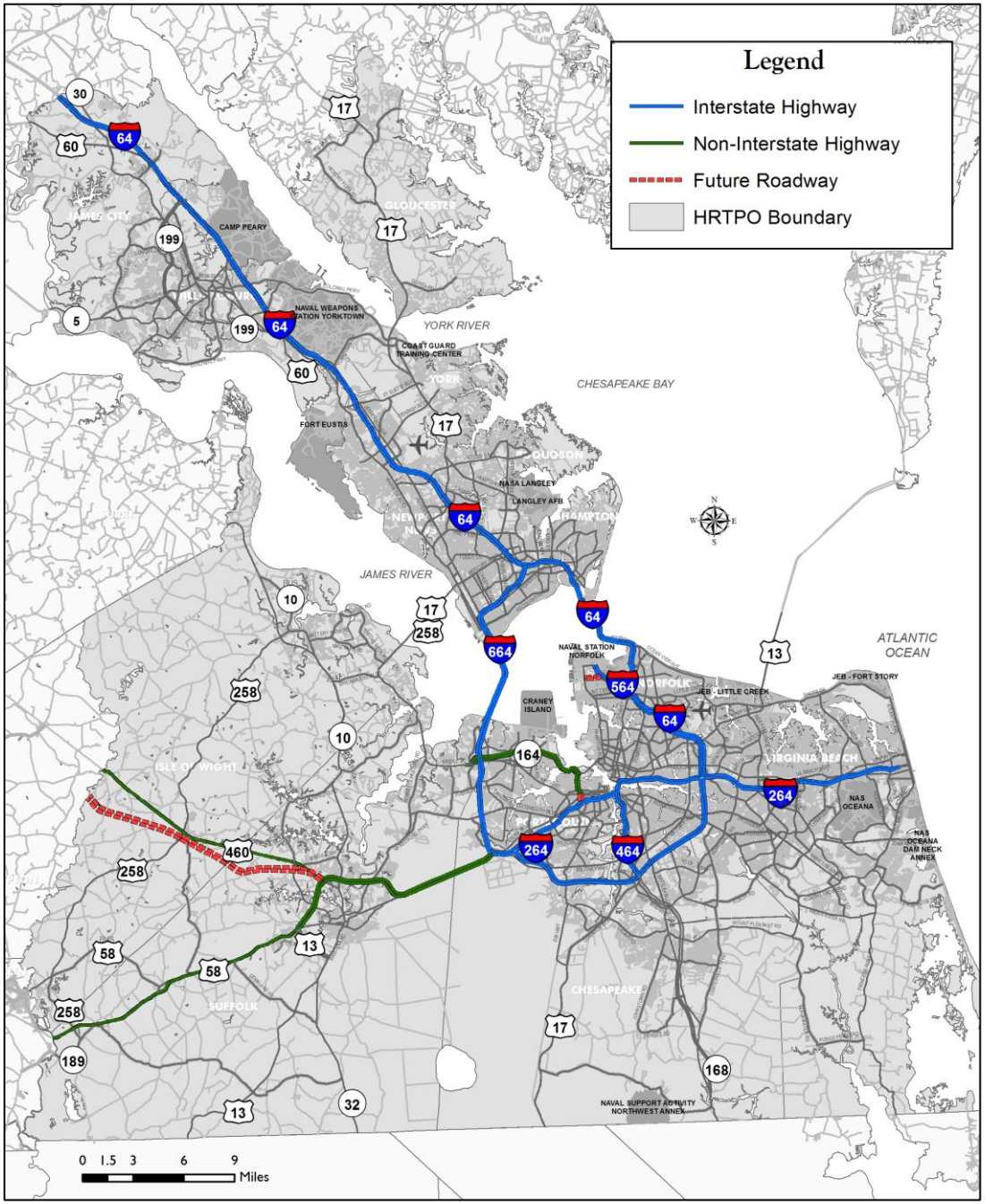
Draft Designation of Highway Primary Freight Network Released on November 19, 2013

A notice published in the Federal Register on February 6, 2013 (78 FR 8686), introduced the process for designation of the highway PFN, NFN, and CRFCs. On November 19, 2013, the Federal Highway Administration (FHWA) published the draft initial designation of the highway Primary Freight Network (PFN) in the Federal Register[6]. Some non-interstate roadways were selected for the draft PFN because they provide connectivity between population centers and key ports, airports and intermodal connectors. The PFN is the first of three parts of the NFN.

[5] As discussed below, designation of NFN is scheduled for 2014.

[6] *Designation of the Primary Freight Network*, US Department of Transportation, Federal Highway Administration, Federal Register Volume 78, Number 223, November 19, 2013.

Map 1 – National Freight Network – Hampton Roads Base Network



Prepared by: HRTPO Staff, August 2013

The analysis contained within this report was performed on the National Freight Network – Hampton Roads Base Network prior to this release. The draft initial designation of the highway PFN included intermodal connectors and last-mile connections to ports, which were not anticipated by HRTPO staff and regional stakeholders when developing the National Freight Network – Hampton Roads Base Network. As a result, the following roadway segments in Hampton Roads – that were included within the draft initial designation of the highway PFN – were not included in this study:

- Hampton Boulevard (S337) – Terminal Boulevard (S406) to Brambleton Avenue (U58)
- Terminal Boulevard (S406) – I-564 to Hampton Boulevard (U58)
- Brambleton Avenue (U58) – Hampton Boulevard (S337) to Raleigh Avenue
- Raleigh Avenue – Orapax Road to Hampton Boulevard (S337)
- Orapax Road – Lamberts Point entrance to Raleigh Avenue
- Battlefield Boulevard – I-64 to Campostella Road
- Atlantic Avenue – Chesapeake Intermodal-Norfolk Southern entrance/Narrow Street to Campostella Road
- 25th Street – Newport News Terminal entrance to Huntington Avenue
- Huntington Avenue – 23rd Street to 26th Street
- 26th Street – Huntington Avenue to I-664
- 25th Street – Newport News Terminal entrance to Huntington Avenue
- 23rd/25th Street Connector – Huntington Avenue to I-664

Given that the initial designation of the highway PFN is still in draft format, this list of PFN roadways is subject to change. If any of these roadway segments listed above are included in the final PFN, HRTPO staff will include them when completing a planned update to this document.

Per the November 19th, 2013 Federal Register, the USDOT solicited comments on the draft initial designation of the highway PFN and other critical aspects of the NFN. HRTPO staff is in the process of submitting comments on the draft PFN via the Freight Transportation Advisory Committee (FTAC) – an advisory committee of the HRTPO Board. Recommended additions to the PFN may include:

1) I-64 on the Southside from Battlefield Boulevard to I-664/I-264
2) Western Freeway/Midtown Tunnel from Brambleton Avenue to I-664, and
3) I-664 from Western Freeway to I-64 on the Peninsula.

National Freight Network Designation Schedule

Listed below is the current schedule for designation of the NFN[7]:

- Fall 2013 – Draft designation of highway Primary Freight Network.
- Fall 2013 – Comment period for highway Primary Freight Network designation.
- Early 2014 – Review and analysis of comments.
- Early 2014 – Final initial highway Primary Freight Network.
- Early 2014 – Finalization of Critical Rural Freight Corridors guidance.
- Spring 2014 – Requests for States to designate Critical Rural Freight Corridors.
- Spring 2014 – Compilation of State-designated Critical Rural Freight Corridors routes.
- Mid 2014 – Release of the initial designation of the full National Freight Network (including the highway Primary Freight Network, rest of the Interstate System, and Critical Rural Freight Corridors).

[7] *Overview of the Draft Highway Primary Freight Network*, US Department of Transportation, Federal Highway Administration, Talking Freight Seminar Presentation, November 20, 2013.

FREIGHT NETWORK – CONDITION AND PERFORMANCE

According to the freight provisions within MAP-21, the USDOT must develop and maintain a National Freight Strategic Plan. Within the plan, the USDOT [in consultation with state DOTs and other stakeholders] must "assess the condition and performance of the National Freight Network" [§1115; 23 USC 167]. This section of the report assesses the condition and performance and determines the following deficiencies for those Hampton Roads highways that are anticipated to be part of the National Freight Network, as identified in the previous section:

- Congested Roadway Segments
- Deficient Bridges
- Vertical Clearances Below Preferred Height
- Inadequate Lane Widths
- Poor Pavement Conditions

CONGESTED ROADWAY SEGMENTS

Congestion levels for roadways in Hampton Roads that are anticipated to be part of the National Freight Network were obtained from HRTPO's latest Congestion Management Process (CMP) document – Volumes, Speeds, and Congestion on Major Roadways in Hampton Roads[8]. The Congestion Management Process is an on-going process that identifies, develops, evaluates, and implements transportation strategies to enhance mobility regionwide. The CMP congestion analysis determines weekday congestion levels by roadway segment for all vehicles including trucks. Roadway segment congestion levels were determined using INRIX speed data and *Highway Capacity Manual*[9] (HCM) traffic volume-based level of service methods for roadways without speed data.

INRIX is a private company that has deployed new technologies to collect travel time and speed data on a continuous basis throughout the nation's largest metropolitan areas. INRIX's primary data source is millions of GPS-enabled fleet vehicles – such as taxis, service vehicles, and long haul trucks. This data was purchased by VDOT and provided to Metropolitan Planning Organizations throughout the state.

[8] *Volumes, Speeds, and Congestion on Major Roadways in Hampton Roads*, HRTPO, June 2013.

[9] *Highway Capacity Manual*, Transportation Research Board, 2010.

Congestion levels for roadways in Hampton Roads with INRIX speed data are determined based on travel time index (TTI). The TTI is calculated by INRIX and represents the ratio of travel time in the peak hour to travel time in free-flow conditions. A TTI of 1.20 means a 20-minute free-flow trip takes 20% longer, i.e. 24 minutes in the peak hour.

Congestion Levels for Roadways with Speed Data

Congestion Level		Freeway	Arterial
Low	LOW	TTI < 1.15	TTI < 1.25
Moderate	MOD	1.15 ≤ TTI < 1.3	1.25 ≤ TTI < 1.4
Severe	SEV	TTI ≥ 1.3	TTI ≥ 1.4

Congestion levels for roadways in Hampton Roads without INRIX speek data are based on traffic volumes and *Highway Capacity Manual* (HCM) level of service (LOS) methods. The HCM is a widely accepted engineering standard. The HCM describes LOS as a measure of operating conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver traffic interruptions, and comfort and convenience.

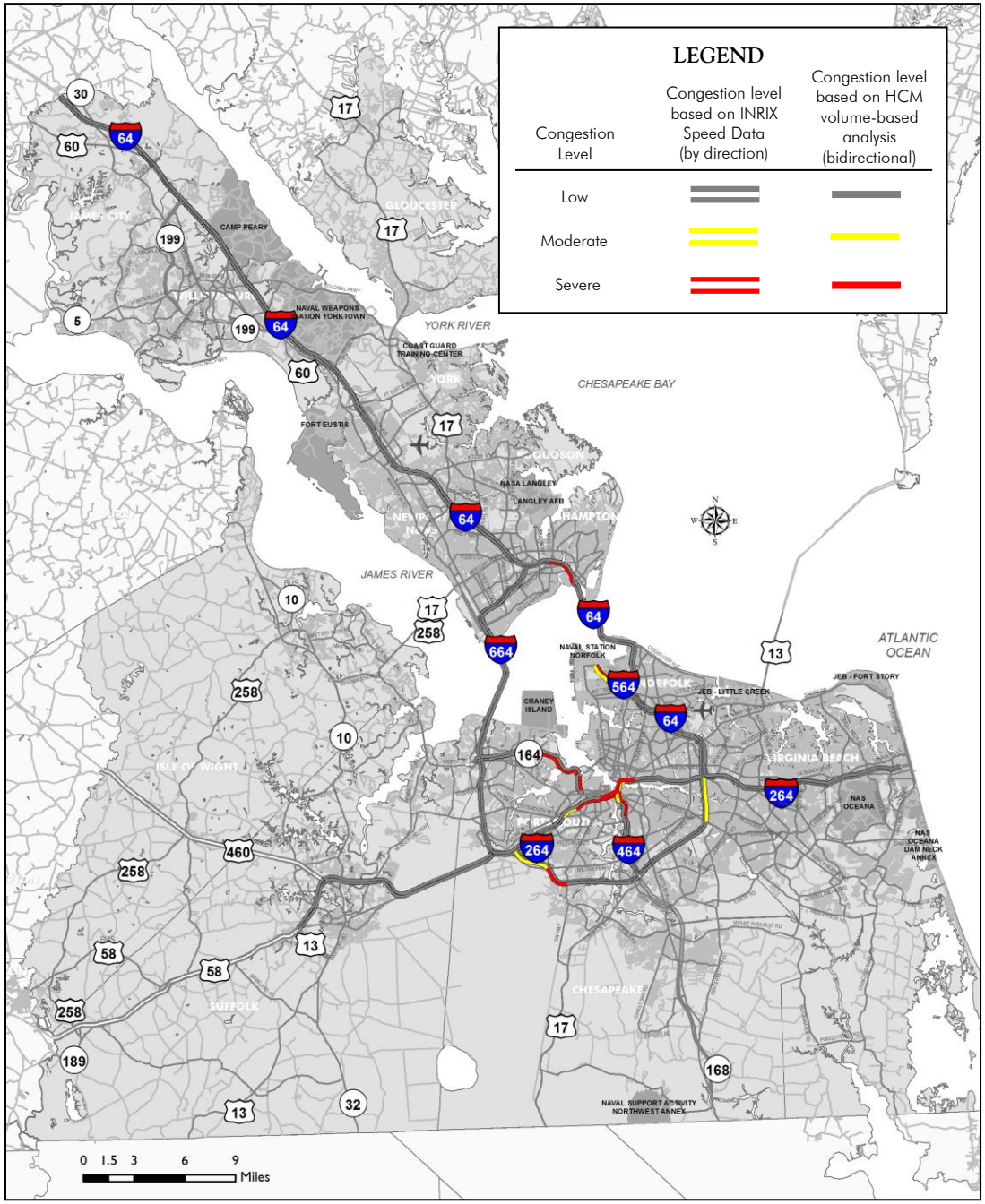
Level of service is measured on a scale of "A" through "F," with LOS representing the best operating conditions and LOS F representing the worst. LOS A through D are considered acceptable operating conditions, while LOS E and F (indicated in red in upcoming maps) are considered unacceptable operating conditions. LOS D is the "warning" level condition

Congestion Levels for Roadways without Speed Data

Congestion Level		HCM LOS
Low	LOW	A-C
Moderate	MOD	D
Severe	SEV	E-F

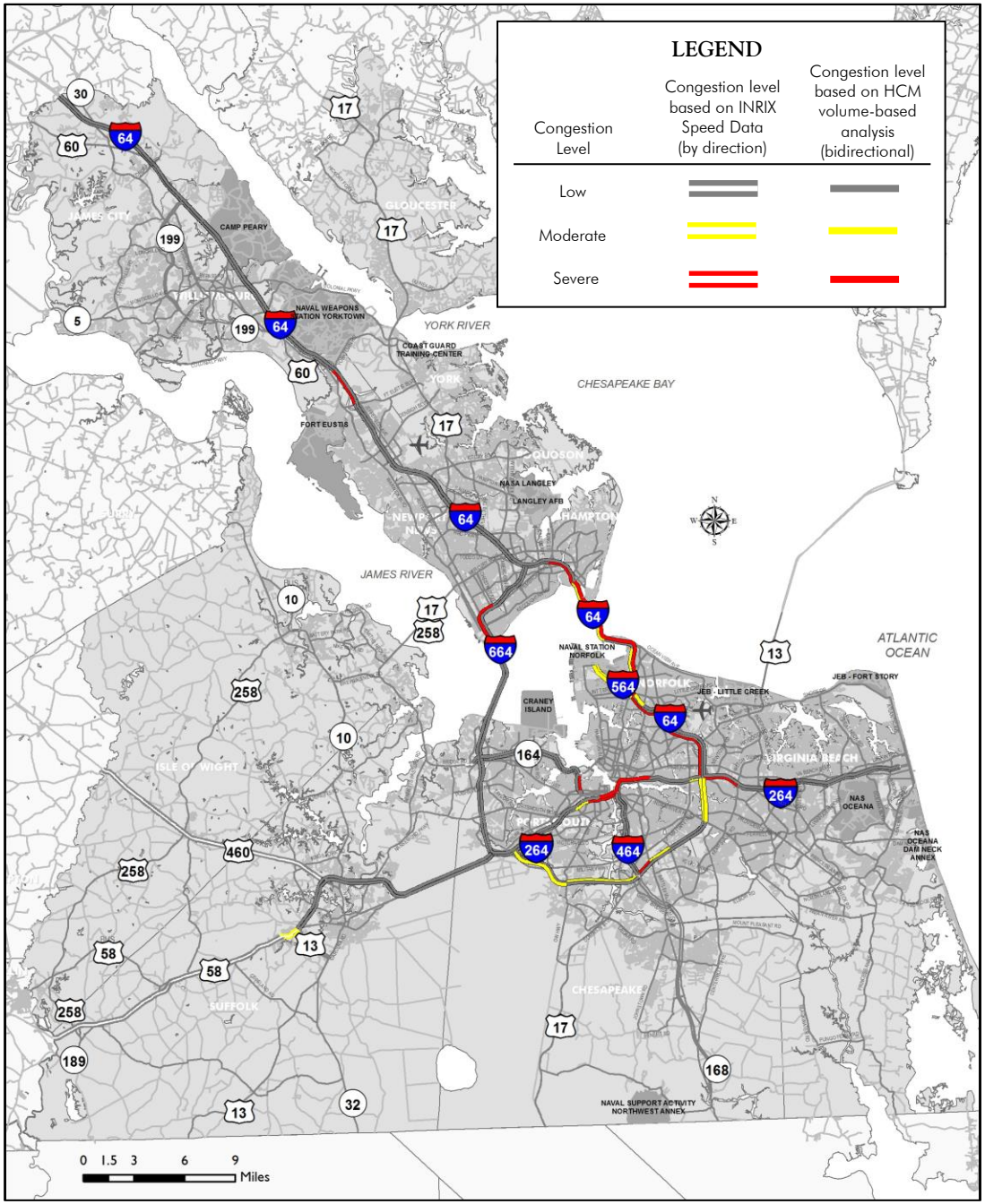
where favorable conditions are on the verge of becoming unfavorable. Congestion levels for roadways in Hampton Roads that are anticipated to be part of the National Freight Network are provided **Maps 2 and 3** and in tabular form in **Appendix A**. Traffic congestion results represent the 2012 existing operating conditions for the AM and PM peak hour during a typical weekday (Tuesday-Thursday) for all roadway vehicles. Severely congested roadways are shown in red.

Map 2 – 2012 Traffic Congestion Levels on Freight Network – AM Peak Hour



Data source: HRTPO analysis of INRIX and VDOT data

Map 3 – 2012 Traffic Congestion Levels on Freight Network – PM Peak Hour



Data source: HRTPO analysis of INRIX and VDOT data

Roadways on Freight Network with Severe Congestion – 2012 AM Peak Hour

- I-264/Downtown Tunnel (EB) – Frederick Blvd to I-464 (Portsmouth/Norfolk)
- I-264/Berkley Bridge/Downtown Tunnel (WB) – Brambleton Ave to Effingham St (Norfolk/Portsmouth)
- I-464 (NB) – Poindexter St to I-264 (Chesapeake/Norfolk)
- I-564 (NB) – I-64 to Admiral Taussig Blvd (Norfolk)
- I-64 (WB toward Va Beach) – Military Hwy to George Washington Hwy (Chesapeake)
- I-64 (EB) – Rip Rap Rd to Mallory St (Hampton)
- MLK Fwy (NB) – London Blvd to Western Fwy/Midtown Tunnel (Portsmouth)
- Western Fwy (EB) – Cedar Ln to MLK Fwy/Midtown Tunnel (Portsmouth)

Roadways on Freight Network with Severe Congestion – 2012 PM Peak Hour

- I-64 (EB) – Yorktown Rd to Fort Eustis Blvd (Newport News)
- I-64 (EB) – Rip Rap Rd to Mallory St (Hampton)
- I-64 (EB) – I-564/Little Creek Rd to I-264 (Norfolk)
- I-64 (EB toward Suffolk) – Battlefield Blvd to I-464 (Chesapeake)
- I-64/HRBT (WB) – I-564/Little Creek Rd to Mallory St (Norfolk/Hampton)
- I-264/Downtown Tunnel (EB) – Des Moines Ave to I-464 (Portsmouth/Norfolk)
- I-264/Berkley Bridge/Downtown Tunnel (WB) – Ballentine Blvd to Effingham St (Norfolk/Portsmouth)
- I-264 (EB) – Witchduck Rd to I-64 (Norfolk/Virginia Beach)
- MLK Fwy (NB) – London Blvd to Western Fwy/Midtown Tunnel (Portsmouth)
- I-564 (SB) – International Terminal Blvd to I-64 (Norfolk)
- I-664 (SB) – Chestnut Ave to Terminal Ave (Newport News)

DEFICIENT BRIDGES

This section identifies the location of deficient bridges on and crossing/spanning the National Freight Network – Hampton Roads Base Network. Bridge data for Hampton Roads was obtained from the Virginia Department of Transportation's (VDOT) Structure and Bridge Division and, for federally-maintained bridges, the Federal Highway Administration's (FHWA) National Bridge Inventory (NBI) database. All bridges are inspected on a 24-month cycle, unless conditions warrant more frequent inspections. All bridge data was downloaded from these sources in August 2013.

Definitions for structurally deficient bridges, functionally obsolete bridges, and sufficiency rating are provided below.

Structurally Deficient Bridges[10] – A structurally deficient bridge is a structure with elements that need to be monitored and/or repaired. These bridges typically require more frequent inspections, maintenance and repair and eventually need to be rehabilitated or replaced to address deficiencies. In spite of these deficiencies, a structurally deficient bridge is not necessarily unsafe. Bridge inspectors will close or impose limits on bridges they feel are unsafe.

For a bridge to be classified as structurally deficient, at least one of the following conditions must be true:

- Deck Condition Rating ≤ 4
- Superstructure Condition Rating ≤ 4
- Substructure Condition Rating ≤ 4
- Culvert Condition Rating ≤ 4
- Structural Condition Rating ≤ 2
- Waterway Adequacy Rating ≤ 2

By rule, any structure that is classified as structurally deficient cannot also be classified as functionally obsolete. Structures that have ratings that would qualify the bridge to be classified as both structurally deficient and functionally obsolete are classified as structurally deficient. Furthermore, any bridge that was built or constructed within the last ten years cannot be classified as structurally deficient or functionally obsolete.

Functionally Obsolete Bridges[11] – A functionally obsolete bridge is a structure that was built to geometric standards that are no longer used today. Functionally obsolete bridges may not have adequate lane widths, shoulder widths, or vertical clearances for the current traffic demand on the bridge. Functionally obsolete bridges may also occasionally be flooded, or have approaches that are difficult to navigate. In spite of these geometric deficiencies, functionally obsolete bridges are not inherently unsafe. Inspectors will close or impose limits on bridges that they feel are unsafe.

For a structure to be classified as functionally obsolete, at least one of the following conditions must be true:

- Structural Condition Rating = 3
- Waterway Adequacy Rating = 3
- Deck Geometry Rating ≤ 3
- Underclearances Rating ≤ 3
- Approach Roadway Alignment Rating ≤ 3

Sufficiency Rating[12] – A sufficiency rating is a numerical rating for each bridge based on its structural adequacy and safety, essentiality for public use, and its serviceability and functional obsolescence. These factors are used to obtain a numeric value between 0% and 100%, with a sufficiency rating of 100% representing an entirely sufficient bridge. It is important to note that a bridge's sufficiency rating does not reflect the ability of the bridge to handle traffic loads. Those bridges with low sufficiency ratings are not necessarily unsafe. A sufficiency rating helps determine which bridges may need repair or replacement, not which bridges are in danger of collapsing.

Sufficiency ratings were developed and are used by FHWA as a method of prioritizing federal bridge funds (High Bridge Program) for allocation. A bridge that is classified as either structurally deficient or functionally obsolete and has a sufficiency rating of less than 50.0 is eligible for replacement funds, while a bridge that is classified as either structurally

[10] Hampton Roads Regional Bridge Study – 2012 Update, HRTPO, November 2012.

[11] Ibid.

[12] Ibid.

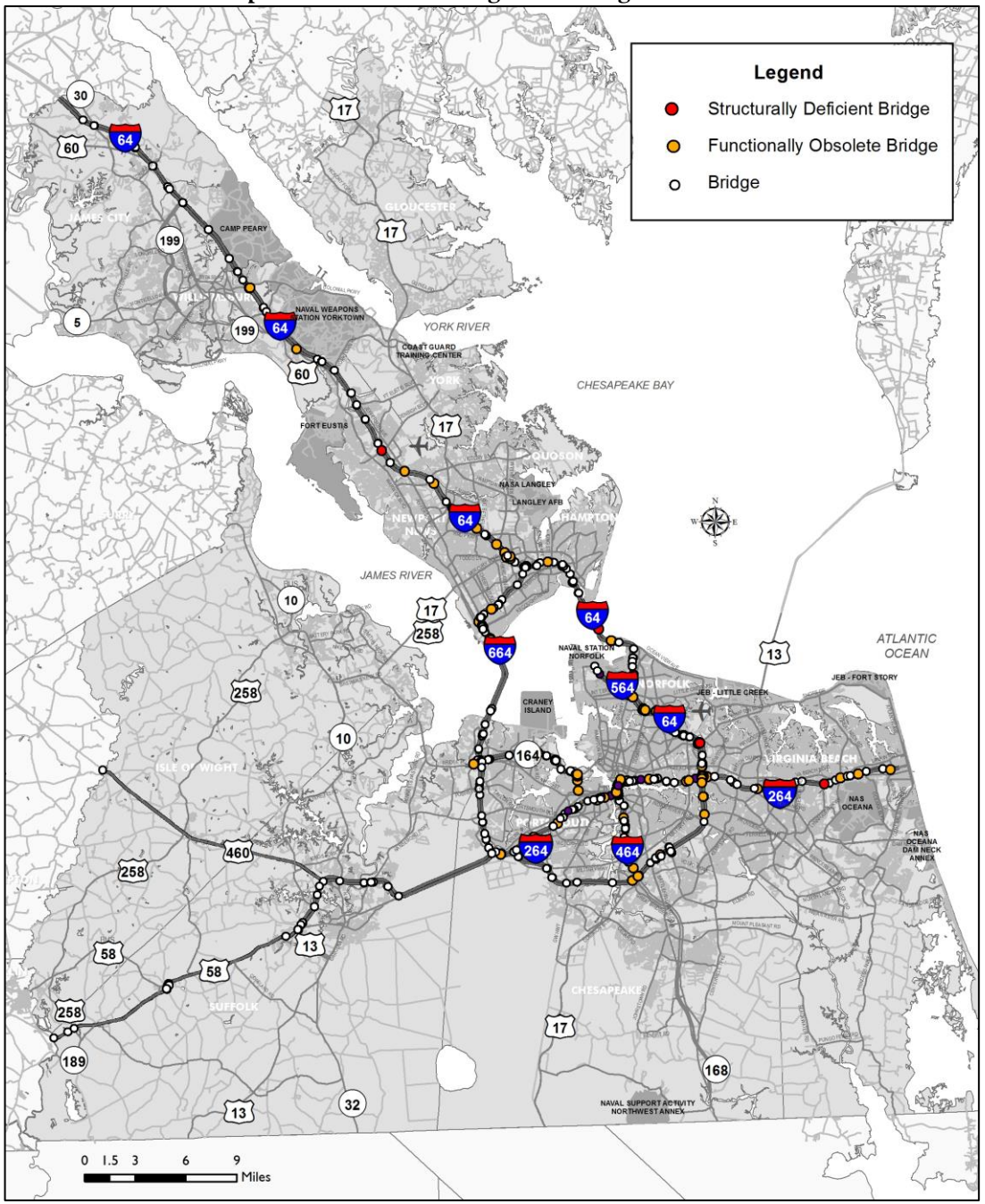
deficient or functionally obsolete and has a sufficiency rating of between 50.0 and 80.0 is eligible for rehabilitation funds. Bridges that have been constructed or had a major rehabilitation within the last ten years cannot be classified as structurally deficient or functionally obsolete and as such are not eligible for Highway Bridge Program funds.

For this study, a total of 457 bridges located on the National Freight Network – Hampton Roads Base Network (including those which span the network) were analyzed. Deficient bridges are those bridges that are classified as "Structurally Deficient" or "Functionally Obsolete". Of the 457 bridges, 111 or 24.3% are currently deficient, as shown below.

	Number	Percent
Structurally Deficient Bridges	**5**	**1.1%**
Functionally Obsolete Bridges	**106**	**23.2%**
Deficient Bridges	**111**	**24.3%**
Other Bridges	346	75.7%
TOTAL	**457**	

The 5 Structurally Deficient Bridges are shown in **Map 4** and in **Table 1**. The 106 Functionally Obsolete Bridges are shown in **Map 4** and in **Table 2**.

Map 4 – Deficient Bridges on Freight Network



Data source: HRTPO Analysis of VDOT & FHWA Data (as of August 2013)

Table 1 – Structurally Deficient Bridges on Freight Network

Jurisdiction	Federal Structure ID	Route	FACILITY	CROSSING	Year Built	Year Reconstructed	Deficiency	Sufficiency Rating
Newport News	20727	173	DENBIGH BLVD	I-64 & CSX R/R	1965	1977	Substructure Cond. = 4	38
Virginia Beach	22228	264	I-264	LYNNHAVEN PARKWAY	1967	1986	Superstructure Cond. = 4	52
Norfolk	20858	64	I-64 EB	NORTHAMPTON BLVD	1967	1977	Superstructure Cond. = 4	54.8
Norfolk	20856	64	I-64 EB RAMP	NORTHAMPTON BLVD	1967		Superstructure Cond. = 4	55
Hampton	20352	64	HAMPTON ROADS BRIDGE-TUNNEL EB	HAMPTON ROADS	1974		Superstructure Cond. = 4	63.9

Bridges that are classified as either structurally deficient or functionally obsolete and have sufficiency ratings:

- Less than 50.0 qualify for federal bridge replacement funds **(shown in orange)**.
- Between 50.0 and 80.0 qualify for federal bridge rehabilitation funds **(shown in purple)**.

Source: VDOT, FHWA. Data as of August 2013.

Table 2 – Functionally Obsolete Bridges on Freight Network

Jurisdiction	Federal Structure ID	Route	FACILITY	CROSSING	Year Built	Year Reconstructed	Deficiency	Sufficiency Rating
Hampton	20287	0	BIG BETHEL ROAD	I-64	1989		Deck Geometry = 3	51
Norfolk	20875	64	I-64 EB	VA BEACH BLVD	1968	1986	Underclearances = 2	51
Norfolk	20947	264	I-264 WB	E BR ELIZABETH RIVER	1952	1991	Underclearances = 3	51.2
Norfolk	21026	406	INT TERMINAL BLVD WB	I-564 & NS R/R	1975		Deck Geometry = 2, Underclearances = 2	54.2
Norfolk	26334	13	MILITARY HIGHWAY	I-264	2000		Deck Geometry = 2, Underclearances = 2	62
Portsmouth	21242	264	I-264	WB RAMP FROM EFFINGHAM STREET	1966	1985	Not available	64
Virginia Beach	22237	264	I-264	VA BEACH BLVD	1967	1982	Underclearances = 2	64
Norfolk	20764	F-135	FRONTAGE ROAD	I-264	1967		Underclearances = 3	64.4
Chesapeake	21943	464	I-464 SB	I-64	1967		Underclearances = 3	64.7
Virginia Beach	22232	264	I-264	LONDON BRIDGE ROAD	1967	1982	Underclearances = 3	65
Hampton	20316	64	I-64 EB	PEMBROKE AVENUE & HAMPTON RIVER	1958	1987	Underclearances = 2	67.1
Norfolk	20837	64	I-64 WB	MILITARY HWY	1966		Underclearances = 3	69.4
Virginia Beach	22222	264	I-264	INDEPENDENCE BLVD	1967	1992	Underclearances = 2	70
Norfolk	20864	64	I-64 WB	KEMPSVILLE RD	1967	1991	Underclearances = 3	72.8
Hampton	20328	664	I-664 SB RAMP	I-64 & NEW MARKET CREEK	1981		Underclearances = 3	73.2
Chesapeake	21906	190	GREAT BRIDGE BLVD	I-64	1967		Underclearances = 2	73.5
Chesapeake	21941	464	I-464 NB	I-64	1967		Underclearances = 3	73.5
James City County	10491	64	I-64 WB	NAVAL WEAPONS STATION ACCESS	1965	1982	Not available	73.6
Norfolk	20860	64	I-64 WB	NORTHAMPTON BLVD	1967	1977	Underclearances = 2	73.6
Norfolk	20881	64	I-64 WB	I-264 WB	1968	1992	Underclearances = 2	73.6
Norfolk	20877	64	I-64 WB	VA BEACH BLVD	1968	1992	Underclearances = 2	73.7
Norfolk	21074	564	I-564 NB	GRANBY STREET	1972		Underclearances = 3	73.8
Norfolk	20815	64	I-64 EB	SEWELLS POINT ROAD	1965	1977	Underclearances = 2	74.3
Norfolk	20902	64	I-64 EB	GRANBY STREET	1971	1991	Underclearances = 3	74.3

Bridges that are classified as either structurally deficient or functionally obsolete and have sufficiency ratings:

- Less than 50.0 qualify for federal bridge replacement funds **(shown in orange)**.
- Between 50.0 and 80.0 qualify for federal bridge rehabilitation funds **(shown in purple)**.

Source: VDOT, FHWA. Data as of August 2013.

Table 2 – Functionally Obsolete Bridges on Freight Network (continued)

Jurisdiction	Federal Structure ID	Route	FACILITY	CROSSING	Year Built	Year Reconstructed	Deficiency	Sufficiency Rating
Hampton	20364	152	CUNNINGHAM DRIVE WB	I-64	1974		Deck Geometry = 3	74.4
Hampton	20362	152	CUNNINGHAM DRIVE EB	I-64	1974		Deck Geometry = 3	74.6
Norfolk	21053	464	I-464 NB	BERKLEY AVENUE	1988		Deck Geometry = 3	75
Virginia Beach	22265	64	I-64 WB	E BR ELIZABETH RIVER	1967	1992	Underclearances = 3	75
Virginia Beach	22243	264	I-264	BIRDNECK ROAD	1967	1996	Underclearances = 2	75.3
Virginia Beach	22267	64	I-64 EB	E BR ELIZABETH RIVER	1967	1992	Underclearances = 3	75.4
Newport News	20649	0	34TH STREET WB	I-664/WARWICK BLVD/CSX R/R	1988		Deck Geometry = 2	75.6
Newport News	20653	0	23RD-25TH STREET	I-664/WARWICK BLVD/CSX R/R	1988		Deck Geometry = 2, Underclearances = 2	75.8
Norfolk	20817	64	I-64 WB	SEWELLS POINT ROAD	1965		Underclearances = 2	75.8
Portsmouth	21193	0	COURT STREET	I-264 WB	1951	1990	Deck Geometry = 2, Underclearances = 3	75.8
Virginia Beach	22287	409	PROVIDENCE ROAD EB	I-64	1967		Deck Geometry = 3	75.8
Hampton	20320	64	I-64	RIP RAP ROAD	1959	1984	Underclearances = 3	76
Newport News	20738	664	I-664	ROANOKE AVENUE	1985		Not available	76
Chesapeake	21791	0	CAMPOSTELLA ROAD	I-464	1966		Underclearances = 2	76.2
Norfolk	20911	64	I-64 WB	13TH VIEW STREET	1972		Underclearances = 2	77.2
Virginia Beach	22285	409	PROVIDENCE ROAD WB	I-64	1967		Deck Geometry = 3	77.9
Newport News	20663	0	28TH STREET	I-664/WARWICK BLVD/CSX R/R	1980		Underclearances = 3	78.1
Norfolk	20909	64	I-64 EB	13TH VIEW STREET	1972		Underclearances = 2	78.3
Norfolk	20793	264	I-264 WB	KEMPSVILLE ROAD	1967	1992	Underclearances = 3	78.6
Norfolk	20795	264	I-264 EB	KEMPSVILLE ROAD	1967	1983	Underclearances = 2	78.6
Portsmouth	21240	264	I-264	EFFINGHAM STREET	1966	1985	Underclearances = 2	79.3
Norfolk	20971	264	I-264 EB	I-264 EB RAMP	1990		Underclearances = 3	79.4
Portsmouth	21220	264	I-264	MCLEAN AVENUE	1964	1979	Underclearances = 2	79.7
Norfolk	21059	464	I-464 NB	I-464 SB RAMP	1987		Underclearances = 3	80.3
Norfolk	20845	64	I-64 EB	RAMP FROM NB TIDEWATER DRIVE	1967		Not available	81
Hampton	26143	134	MAGRUDER BLVD	I-64	2004		Underclearances = 3, Approach Rdwy. Alignment = 3	81.6
Norfolk	20953	264	I-264 EB & I-464 NB	I-264 & I-464 RAMPS	1986		Underclearances = 3	83
Norfolk	21000	264	I-264 WB	HOLT ST & NS R/R	1972	1991	Underclearances = 3	83
Chesapeake	21913	664	I-664 SB	W MILITARY HWY & CSX R/R	1983		Not available	83.4
Newport News	20643	0	OLD OYSTER POINT ROAD	I-64	1991		Underclearances = 3	83.7
Norfolk	20992	264	I-264 EB	HOLT STREET & NS R/R	1972	1990	Underclearances = 3	84
Norfolk	20819	64	I-64 EB	CHESAPEAKE BLVD	1965	1977	Underclearances = 3	84.4
Norfolk	20821	64	I-64 WB	CHESAPEAKE BLVD	1965	1977	Underclearances = 3	84.4
Portsmouth	21190	0	GREENWOOD DRIVE	I-264	1976		Underclearances = 3	85.2
Norfolk	23216	564	I-564 HOV LANES	LITTLE CREEK ROAD	1992		Deck Geometry = 2, Underclearances = 3	85.2
York County	19838	64	I-64 EB	COLONIAL PKWY	1965		Underclearances = 3	85.9
Chesapeake	21911	664	I-664 NB	W MILITARY HWY & CSX R/R	1983		Not available	86.5
Norfolk	20852	64	I-64 EB	RAMP FROM NORTHAMPTON BLVD	1967	1977	Underclearances = 2	86.6
Norfolk	20879	64	I-64 EB	I-264 WB	1968	1985	Underclearances = 2	87.1

Bridges that are classified as either structurally deficient or functionally obsolete and have sufficiency ratings:

- Less than 50.0 qualify for federal bridge replacement funds **(shown in orange)**.
- Between 50.0 and 80.0 qualify for federal bridge rehabilitation funds **(shown in purple)**.

Source: VDOT, FHWA. Data as of August 2013.

Table 2 – Functionally Obsolete Bridges on Freight Network (continued)

Jurisdiction	Federal Structure ID	Route	FACILITY	CROSSING	Year Built	Year Reconstructed	Deficiency	Sufficiency Rating
Norfolk	20975	264	I-264 WB	SR 337 SB	1972	1990	Not available	87.6
Portsmouth	21202	58	LONDON BOULEVARD	MLK FREEWAY	1971		Not available	88.3
Norfolk	20813	64	I-264 EB RAMP	I-264 WB & I-64	1985		Not available	88.9
Norfolk	23046	460	I-264 WB RAMP	CITY HALL AVENUE	1952	1991	Deck Geometry = 2	88.9
Portsmouth	21210	164	ROUTE 164 EB	W. NORFOLK ROAD & N&W R/R	1991		Not available	89
Chesapeake	26355	64	64 EB Collector Rd	OVER B652	2008		Not available	89
Norfolk	23304	64	I-64 HOV LANES	I-264 WB	1992		Deck Geometry = 3, Underclearances = 3	90
Norfolk	23306	64	I-64 HOV LANES	I-264 EB	1992		Deck Geometry = 3, Underclearances = 3	90
Newport News	25809	143	JEFFERSON AVENUE	I-64	2000		Underclearances = 3	90.1
Norfolk	23342	64	I-64 HOV LANES	CNW R/R & CURLEW DR	1992		Deck Geometry = 3	90.3
Chesapeake	21932	337	POINDEXTER STREET	I-464	1980		Not available	90.6
Portsmouth	28350	164	ROUTE 164 WB RAMP FROM CLEVELAND ST	MLK FREEWAY & PMT	2006		Underclearances = 3	90.8
Norfolk	23302	64	I-64 HOV LANES	TIDEWATER DRIVE RAMP	1992		Not available	91
York County	19840	64	I-64 WB	COLONIAL PKWY	1965		Underclearances = 3	91.5
Norfolk	23272	64	I-64 HOV LANES	VA BEACH BLVD	1992		Underclearances = 3	91.6
Portsmouth	26653	58	MLK FREEWAY	CLEVELAND STREET & CSX R/R	2005		Underclearances = 3	91.6
Norfolk	20996	264	I-64 WB RAMP	I-264 WB	1968		Not available	91.7
Norfolk	23214	64	I-64 HOV LANES	I-564 & LITTLE CREEK ROAD	1992		Underclearances = 3	92
Newport News	20647	0	34TH STREET EB	I-664/WARWICK BLVD/CSX R/R	1988		Not available	92.4
Norfolk	21063	464	I-464 SB	I-264 WB RAMP	1988		Underclearances = 3	92.7
Norfolk	21057	464	I-464 SB	I-264 EB	1987		Underclearances = 3	93
Norfolk	23074	64	I-64 HOV LANES	NORTHAMPTON BLVD	1992		Underclearances = 3	93.4
Norfolk	23132	64	I-64 HOV LANES	NORTHAMPTON BLVD SB RAMP	1992		Underclearances = 3	93.4
Norfolk	21049	464	I-464 RAMP	I-464 SB RAMP	1989		Underclearances = 3	93.5
Newport News	29307	664	26th St	I-664	1988		Underclearances = 3	93.6
Hampton	26148	64	MERCURY BLVD RAMP	I-64	2005		Underclearances = 3	93.9
Hampton	26149	64	MERCURY BLVD RAMP	MERCURY BLVD	2005		Not available	93.9
Norfolk	20955	264	I-264 WB	I-264 & I-464 RAMPS	1988		Underclearances = 3	94
Norfolk	20957	264	I-264 & I-464 RAMPS	I-264 EB	1986		Underclearances = 3	94
Norfolk	20959	264	I-264 WB RAMP	I-264 WB	1988		Underclearances = 3	94
Norfolk	20961	264	IBERKLEY AVENUE RAMP	EMERGENCY VEHICLE RAMP	1988		Underclearances = 3	94
Norfolk	21002	264	I-264 EB	BALLENTINE AVENUE	1968		Underclearances = 3	94
Norfolk	21004	264	I-264 WB	BALLENTINE AVENUE	1968		Underclearances = 3	94
Norfolk	21051	464	I-464 SB	I-264 & I-464 RAMPS	1988		Underclearances = 3	94
Norfolk	21061	464	I-464 SB	I-264 WB	1989		Underclearances = 3	94
Norfolk	21065	464	I-464 SB	EMERGENCY VEHICLE RAMP	1988		Underclearances = 3	94
Norfolk	23059	64	I-64 HOV LANES	SEWELLS POINT ROAD	1992		Underclearances = 3	94
Norfolk	20898	64	I-64 EB RAMP	I-64 WB RAMP AT TIDEWATER DR	1971		Underclearances = 3	95
Portsmouth	28396	164	ROUTE 164 EB RAMP TO EB MIDTOWN TUN	MLK FREEWAY WB & PMT	2006		Not available	95.3
Newport News	20759	664	I-664 RAMP	RAMP A	1990		Not available	95.5
Newport News	20761	664	I-664 RAMP	TERMINAL AVENUE	1990		Underclearances = 3	95.6
Hampton	26146	64	I-64 RAMP	MERCURY BLVD	2005		Not available	95.8
Suffolk	23098	164	ROUTE 164 EB	ROUTE 17	1991		Underclearances = 3	96

Bridges that are classified as either structurally deficient or functionally obsolete and have sufficiency ratings:

- Less than 50.0 qualify for federal bridge replacement funds **(shown in orange)**.
- Between 50.0 and 80.0 qualify for federal bridge rehabilitation funds **(shown in purple)**.

Source: VDOT, FHWA. Data as of August 2013.

Vertical Clearances Below Preferred Height

According to the American Association of State Highway and Transportation (AASHTO) "Green Book": *A Policy on Geometric Design of Highways and Streets*[13], the following vertical clearance guidelines are provided for urban and rural freeways:

> "The vertical clearance to structures passing over freeways should be at least 16 feet over the entire roadway width, including auxiliary lanes and the usable width of shoulders with consideration for future resurfacings. In highly developed areas, where attaining a 16 feet clearance would be unreasonably costly, a minimum of 14 feet may be used if there is an alternate freeway facility with the minimum 16 feet clearance."

The AASHTO Green Book is the national roadway design standard used by the Federal Highway Administration (FHWA) and state Departments of Transportation (DOT).

According to the Department of Defense's (DOD) Military Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA) [14], the military-preferred vertical clearance for all rural and urban Interstate highway bridges is 16 feet. The preferred minimum vertical clearance for all other roadways located on their Strategic Highway Network (SRTRAHNET) is 14 feet. Structures with vertical clearances below these preferences not only inhibit the efficient freight movement for the military, but also for many trucking companies traveling to/from Hampton Roads.

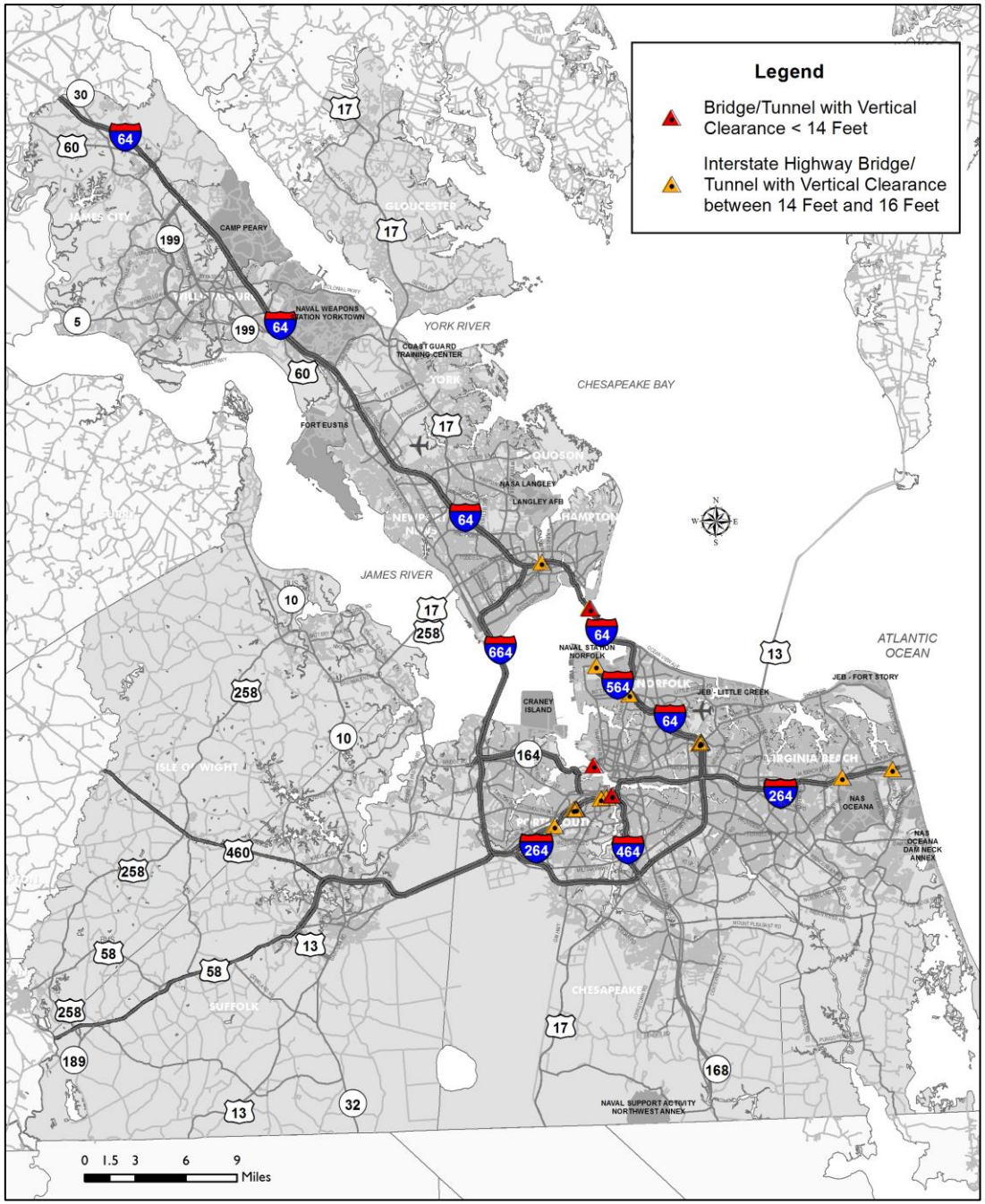
For this study, bridge/tunnel structures with vertical clearances below 14 feet and between 14 feet and 16 feet, located on the National Freight Network – Hampton Roads Base Network (including those which span the network), were identified. All vertical clearance bridge data was downloaded from VDOT and FHWA sources in August 2013. Bridges and tunnels with vertical clearances below 14 feet are shown in red on **Map 5** on page 25 and are listed in **Table 3** on page 26. Bridges and tunnels with vertical clearances between 14 feet and 16 feet are shown in orange on **Map 5** on page 25 and are listed in **Table 4** on page 26.

Illustration of Vertical Clearance

[13] The Green Book, A Policy on Geometric Design of Highways and Streets, American Association of State Highway and Transportation (AASHTO), 6th Edition, 2011, p. 8-4.

[14] Information Paper: Military Design Standards for the National Highway System, Military Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA), August 31, 2000.

Map 5 – Vertical Clearances Below Preferred Height on Freight Network



Data source: HRTPO Analysis of VDOT & FHWA Data (as of August 2013)

Table 3 – Bridges and Tunnels with Vertical Clearances below 14 Feet on Freight Network

Jurisdiction	Federal Structure ID	Route	FACILITY	CROSSING	Vertical Under Clearance*
Norfolk	20952	264	DOWNTOWN TUNNEL EB*	S BR ELIZABETH RIVER	13' 06"
Norfolk	20951	264	DOWNTOWN TUNNEL WB*	S BR ELIZABETH RIVER	13' 06"
Hampton	20354	64	HAMPTON ROADS BRIDGE-TUNNEL WB*	HAMPTON ROADS	13' 06"
Norfolk	20808	58	MIDTOWN TUNNEL*	ELIZABETH RIVER	13' 06"

*For tunnel facilities, vertical clearance (maximum vehicle height) is provided.

Source: VDOT, FHWA. Data as of August 2013.

Table 4 – Bridges and Tunnels with Vertical Clearances between 14 Feet and 16 Feet on Freight Network

Jurisdiction	Federal Structure ID	Route	FACILITY	CROSSING	Vertical Under Clearance*
Hampton	20326	64	I-64	LASALLE AVENUE	14' 03"
Hampton	20340	64	HAMPTON ROADS BRIDGE-TUNNEL EB*	HAMPTON ROADS	14' 06"
Norfolk	20852	64	I-64 EB	RAMP FROM NORTHAMPTON BLVD	14' 09"
Norfolk	20854	64	I-64 WB	RAMP FROM NORTHAMPTON BLVD	14' 09"
Norfolk	20856	64	I-64 EB RAMP	NORTHAMPTON BLVD	14' 01"
Norfolk	20858	64	I-64 EB	NORTHAMPTON BLVD	14' 04"
Norfolk	20860	64	I-64 WB	NORTHAMPTON BLVD	14' 04"
Norfolk	21021	337	ADMIRAL TAUSSIG BLVD	I-564 RAMPS	14' 09"
Norfolk	21072	564	I-564 SB	GRANBY STREET	15' 09"
Portsmouth	21193		COURT STREET	I-264 WB	14' 03"
Portsmouth	21222	264	I-264 EB RAMP	FREDERICK BLVD	14' 07"
Portsmouth	21229	264	I-264	FREDERICK BLVD	14' 09"
Portsmouth	21235	264	I-264	RAMP FROM FREDERICK BLVD	14' 07"
Portsmouth	21237	264	I-264	VICTORY BLVD	14' 06"
Portsmouth	21240	264	I-264	EFFINGHAM STREET	14' 09"
Virginia Beach	22232	264	I-264	LONDON BRIDGE ROAD	14' 01"
Virginia Beach	22243	264	I-264	BIRDNECK ROAD	14' 04"

*For tunnel facilities, vertical clearance (maximum vehicle height) is provided.

Source: VDOT, FHWA. Data as of August 2013.

Inadequate Lane Widths

American Association of State Highway and Transportation Officials' (AASHTO) Green Book – A Policy on Geometric Design of Highways and Streets provides guidance for new roadway design and construction. **Table 5** shows AASHTO's roadway design ranges for lane width for various types of roadways. Lane width refers to the width of the travel lane and does not include shoulders, curbs, and on-street parking areas. The fact that new design values are presented within the guidebook (e.g. lane widths) does not imply that existing streets and highways are unsafe if they do not meet the standard, nor does it mandate the initiation of improvement projects[15].

According to the AASHTO Green Book, inadequate roadway lane widths can negatively impact safety and traffic operations. The lane width influences the comfort of driving, operational characteristics, and, in some situations, the likelihood of crashes[16]. A wider 12-foot lane provides desirable clearances between large commercial vehicles traveling in opposite directions on two-way undivided rural highways when high traffic volumes and particularly high percentages of trucks are expected (e.g. Route 460). Lane widths also affect highway speeds and level of service (**Table 6**). Narrow lanes force drivers to operate their vehicles closer to each other laterally than they would normally desire.

Based on the existing roadway characteristics of freeways and arterials located on the National Freight Network – Hampton Roads Base Network, AASHTO recommends lane widths of 12 feet. **Map 6 and Table 7** below identify all roadway segments with average lane widths below 12 feet using data obtained from the Virginia Department of Transportation[17]. Route 460/Pruden Boulevard in Isle of Wight County and Suffolk is currently the only roadway below this threshold with average lane widths of 10 feet from the Suffolk Bypass to the Southampton County line. Route 460 lane widths are currently at substandard design requirements. As stated earlier, these roadway segments for Route 460 are not necessarily unsafe, even though the lane width is currently a substandard design.

[15] The Green Book, A Policy on Geometric Design of Highways and Streets, American Association of State Highway and Transportation (AASHTO), 6th Edition, 2011.

[16] The Green Book, A Policy on Geometric Design of Highways and Streets, American Association of State Highway and Transportation (AASHTO), 6th Edition, 2011, p 4-7.

[17] Virginia Department of Transportation (VDOT), Statewide Planning System (SPS) Lite Database, 2012.

Table 5 – Roadway Design Ranges for Lane Width

Type of Roadway	Rural		Urban	
	US (feet)	Metric (meters)	US (feet)	Metric (meters)
Freeway	12	3.6	12	3.6
Ramps (1-lane)	12-30	3.6-9.2	12-30	3.6-9.2
Arterial	11-12	3.3-3.6	10-12	3.0-3.6
Collector	10-12	3.0-3.6	10-12	3.0-3.6
Local	9-12	2.7-3.6	9-12	2.7-3.6

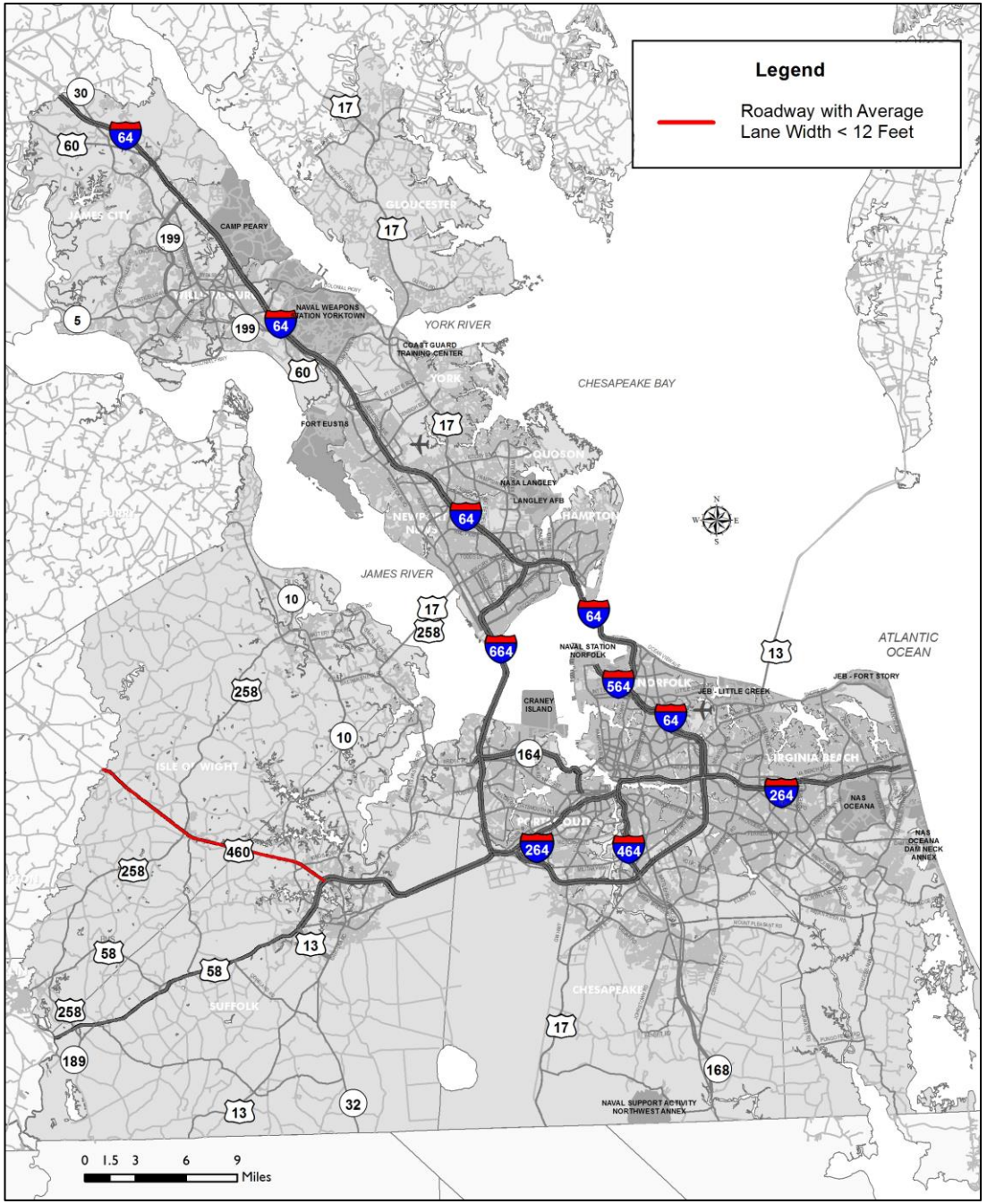
Source: A Policy on Geometric Design of Highways and Streets, AASHTO
http://safety.fhwa.dot.gov/geometric/pubs/mitigationstrategies/chapter3/3_lanewidth.htm

Table 6 – Operational Effects of Freeway Lane Widths

Lane width (ft)	Reduction in Free-Flow Speed (mi/h)
12	0.0
11	1.9
10	6.6
Lane width (m)	**Reduction in Free-Flow Speed (km/h)**
3.6	0.0
3.5	1.0
3.4	2.1
3.3	3.1
3.2	5.6
3.1	8.1
3.0	10.6

Source: Highway Capacity Manual
http://safety.fhwa.dot.gov/geometric/pubs/mitigationstrategies/chapter3/3_lanewidth.htm

Map 6 – Roadways with Lane Widths below 12 Feet on Freight Network



Data source: VDOT

Table 7 – Roadways with Lane Widths below 12 Feet on Freight Network

JURIS NAME	FACILITY NAME	SEGMENT FROM	SEGMENT TO	SEGMENT LENGTH (MILES)	2012 LANES	AVG LANE WIDTH
IW	ROUTE 460	SOUTHAMPTON CL	FIRETOWER RD (RTE 644)	0.54	4	10
IW	ROUTE 460	FIRETOWER RD (RTE 644)	WCL WINDSOR	5.56	4	10
IW/WIND	ROUTE 460	WCL WINDSOR	ROUTE 258	0.08	4	10
IW/WIND	ROUTE 460	ROUTE 258	COURT ST (RTE 610)	0.46	4	10
IW	ROUTE 460	COURT ST (RTE 610)	ECL WINDSOR	0.75	4	10
IW	ROUTE 460	ECL WINDSOR	SUFFOLK CL	2.35	4	10
SUF	PRUDEN BLVD (ROUTE 460)	ISLE OF WIGHT CL	LAKE PRINCE DR	3.08	4	10
SUF	PRUDEN BLVD (ROUTE 460)	LAKE PRINCE DR	KINGS FORK RD	0.58	4	10
SUF	PRUDEN BLVD (ROUTE 460)	KINGS FORK RD	SUFFOLK BYPASS	1.47	4	10

Poor Pavement Conditions

The most recent roadway pavement condition data for Hampton Roads was obtained from the Virginia Department of Transportation's (VDOT) Maintenance Division – Central Office. This data is collected on an annual basis by VDOT's contractor on the entire Interstate and Primary highway systems, and approximately 20% of the Secondary highway system in Virginia using continuous digital imaging and automated crack detection technology.

Pavement conditions are grouped into five categories (excellent, good, fair, poor, and very poor) based on Critical Condition Index (CCI) values (see **Table 8**). CCI is a measure of pavement distress. CCI incorporates distresses that are related to vehicle load related damages to pavement (e.g. fatigue cracking, patching, rutting, etc) and non-load related distresses (e.g. transverse and longitudinal cracking, longitudinal joint separation, bleeding, etc.). In general, pavement sections with CCI values below 60 (poor and very poor) are considered "deficient" and should be further evaluated for maintenance and rehabilitation actions. Pavement sections with CCI value of at least 60 (fair or better) are considered "sufficient". For more information regarding CCI, refer to VDOT's *State of the Pavement 2012* report[18].

The 2012 pavement conditions for the National Freight Network – Hampton Roads Base Network is shown in **Map 7** on page 31. The pavement images were taken in November and December 2012. VDOT is currently rehabilitating many roadways with deficient pavement sections throughout Hampton Roads. As a result, the pavement conditions shown on Map 7 may have changed.

Table 8 – Pavement Condition Categories

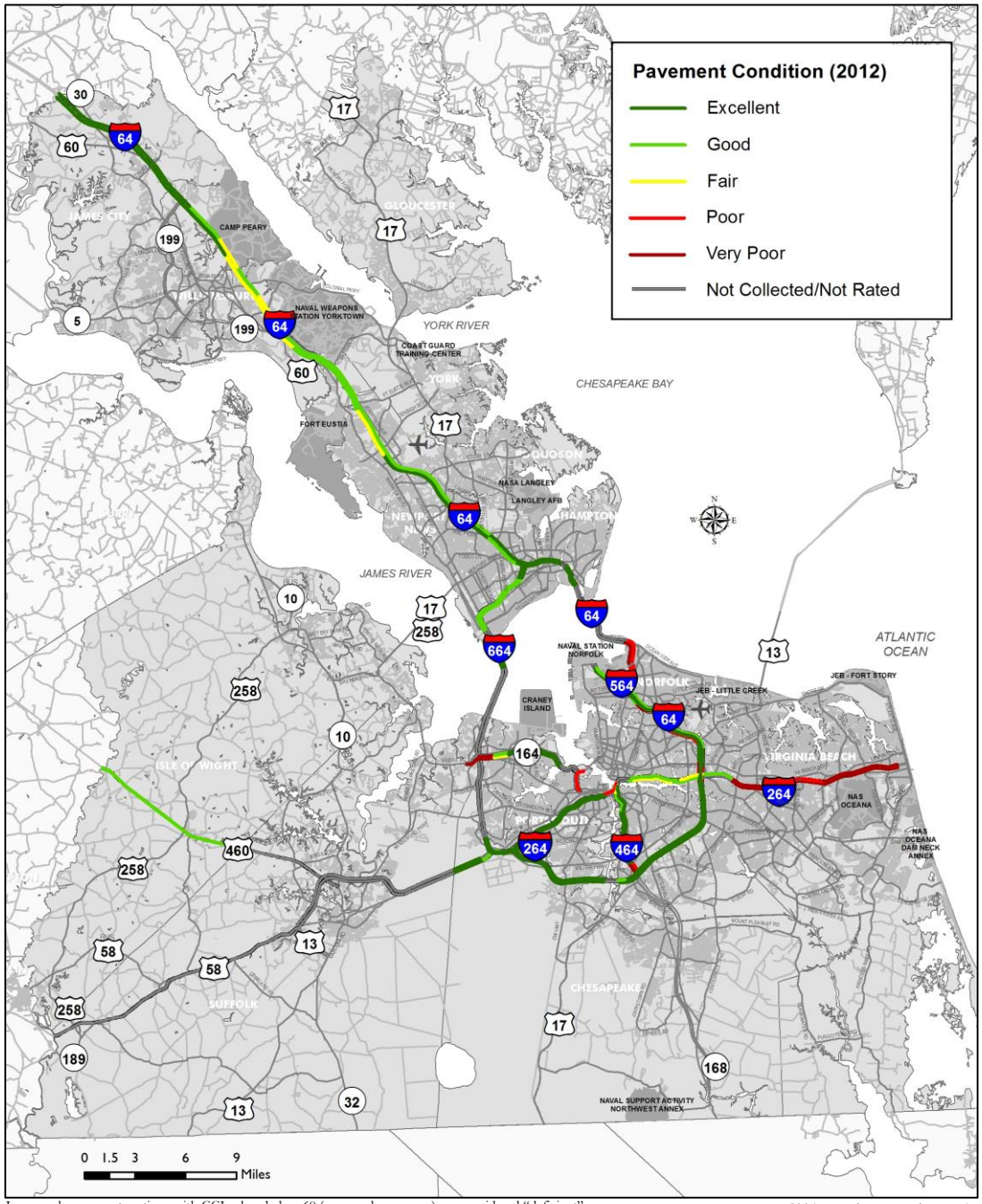
Pavement Condition	Index Scale (CCI)
Excellent	90 and above
Good	70-89
Fair	60-69
Poor	50-59
Very Poor	49 and below

CCI – Critical Condition Index

Source: VDOT

[18] *State of the Pavement 2012*, VDOT, November 2012, p. 99-103.

Map 7 – 2012 Pavement Condition



In general, pavement sections with CCI values below 60 (poor and very poor) are considered "deficient".

Data source: VDOT (November-December 2012)

Freight Bottlenecks on Highways

According to the freight provisions within MAP-21, States and other stakeholders must develop and maintain a National Freight Strategic Plan. Within the plan, States must "identify highway bottlenecks that cause significant freight congestion" [§1115; 23 USC 167]. This section of the study identifies existing and future highway bottlenecks along the National Freight Network – Hampton Roads Base Network using the results from the recently completed HRTPO study – Existing and Future Truck Delay in Hampton Roads[19].

Freight Bottlenecks on Highways in Hampton Roads

Candidate freight bottlenecks on highways in Hampton Roads were determined using thresholds of congested truck travel from the HRTPO truck delay study completed in September 2013[20]. Within that report, the 2010 existing and 20-year forecast total weekday truck delays (hours) were computed by roadway segment. This section utilizes those results and calculates the total weekday truck delay per mile for the National Freight Network – Hampton Roads Base Network. In order to determine the worst freight bottlenecks in the region, the total weekday truck delay per mile performance measure was grouped into four categories:

- 0.00 – 10.00 hours/mile
- 10.01 – 20.00 hours/mile
- 20.01 – 30.00 hours/mile (Moderate)
- 30.01 + hours/mile (Severe)

For this study, existing and future candidate freight bottlenecks were identified by roadway segments with severe total weekday truck delay per mile (30.01+ hours/mile).

Total Weekday Truck Delay Definition

Congested truck travel is measured by truck delay – the difference between an "ideal" travel time for a truck on a given roadway segment and the "actual" travel time. The "ideal" travel time is determined by the length of the travel segment divided by the free flow travel speed or uncongested speed. The "actual" travel time is determined the length of the travel segment divided by the actual travel speed or congested speed. Total truck delay is determined by multiplying the delay for a given travel segment by the truck volume (number of trucks) as shown in the equation below.

Existing and Future Truck Delay in Hampton Roads (September 2013)

$$\textbf{Total Truck Delay} = \left(\left(\frac{Truck\ Volume\ x\ Segment\ Length}{Segment\ Actual\ Travel\ Speed}\right) - \left(\frac{Truck\ Volume\ x\ Segment\ Length}{Segment\ Free\ Flow\ Travel\ Speed}\right)\right)$$

HRTPO staff estimated the amount of existing total weekday truck delay in Hampton Roads using the 2010 INRIX average weekday speed data[21] from the Hampton Roads Travel Time/Speed Study[22] and the most recent Virginia Department of Transportation (VDOT) truck volumes/estimates from 2009 to 2011. The 20-year forecast total weekday truck delay was calculated using the new truck component and time-of-day capability of the regional travel demand model. Please see the HRTPO Existing and Future Truck Delay in Hampton Roads study for more details[23].

[19] *Existing and Future Truck Delay in Hampton Roads*, HRTPO, September 2013.

[20] *Ibid.*

[21] Includes recurring congestion (peak hour/capacity) and non-recurring congestion (unexpected delays/incidents).

[22] *Hampton Roads Regional Travel Time/Speed Study*, HRTPO, April 2012.

[23] *Existing and Future Truck Delay in Hampton Roads*, HRTPO, September 2013.

Freight Bottlenecks on Freight Network Highways – 2010 Existing

For this study, 2010 existing freight bottlenecks were determined by two criteria:

A. corridors having roadway segments with severe truck delays of 30.01 hours/mile or more (**Map 8**)
B. corridors with total weekday truck delay of 100 hours or more.

The only existing freight bottleneck that meets this criteria is the (**Map 10**):

1. **Downtown Tunnel (I-264)** from Des Moines Avenue in Portsmouth to Brambleton Avenue in Norfolk *(Total Weekday Truck Delay[24] – 169 hours)*

Freight Bottlenecks on Freight Network Highways – 20-Year Forecast

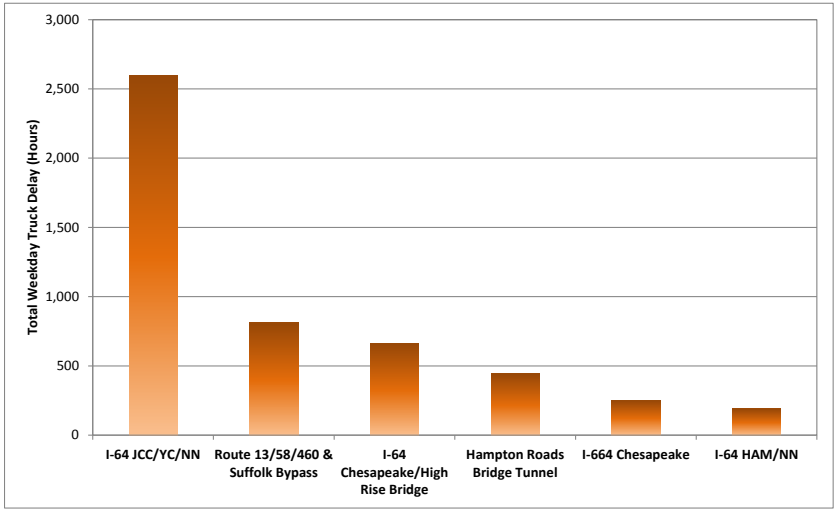
For this study, future freight bottlenecks were determined by the same two criteria used for existing bottlenecks above:

A. corridors having roadway segments with severe truck delays of 30.01 hours/mile or more (**Map 9**)
B. corridors with total weekday truck delay of 100 hours or more.

Future freight bottlenecks that meet these criteria are (**Map 10**):

1. **I-64 James City County/York County/Newport News** – Route 30 (James City County) to Jefferson Avenue (Newport News) *(Total Weekday Truck Delay[25] – 2,598 hours)*
2. **Route 13/58/460 & Suffolk Bypass** – I-664 (Chesapeake) to Wilroy Road (Suffolk) *(Total Weekday Truck Delay – 811 hours)*
3. **I-64 Chesapeake/High Rise Bridge** – I-464 to Military Highway (Chesapeake) *(Total Weekday Truck Delay – 663 hours)*
4. **Hampton Roads Bridge Tunnel** – Settlers Landing Road (Hampton) to 4th View Avenue (Norfolk) *(Total Weekday Truck Delay – 445 hours)*
5. **I-664 Chesapeake** – Routes 13/58/460 (Chesapeake) to Bridge Road (Suffolk) *(Total Weekday Truck Delay – 252 hours)*
6. **I-64 Hampton/Newport News** – JC Morris Boulevard (Newport News) to I-664 (Hampton) *(Total Weekday Truck Delay – 191 hours)*

The 2010 existing and 20-year forecast total weekday truck delay and truck delay per mile for all of the National Freight Network – Hampton Roads Base Network highways is provided in **Appendix B**.

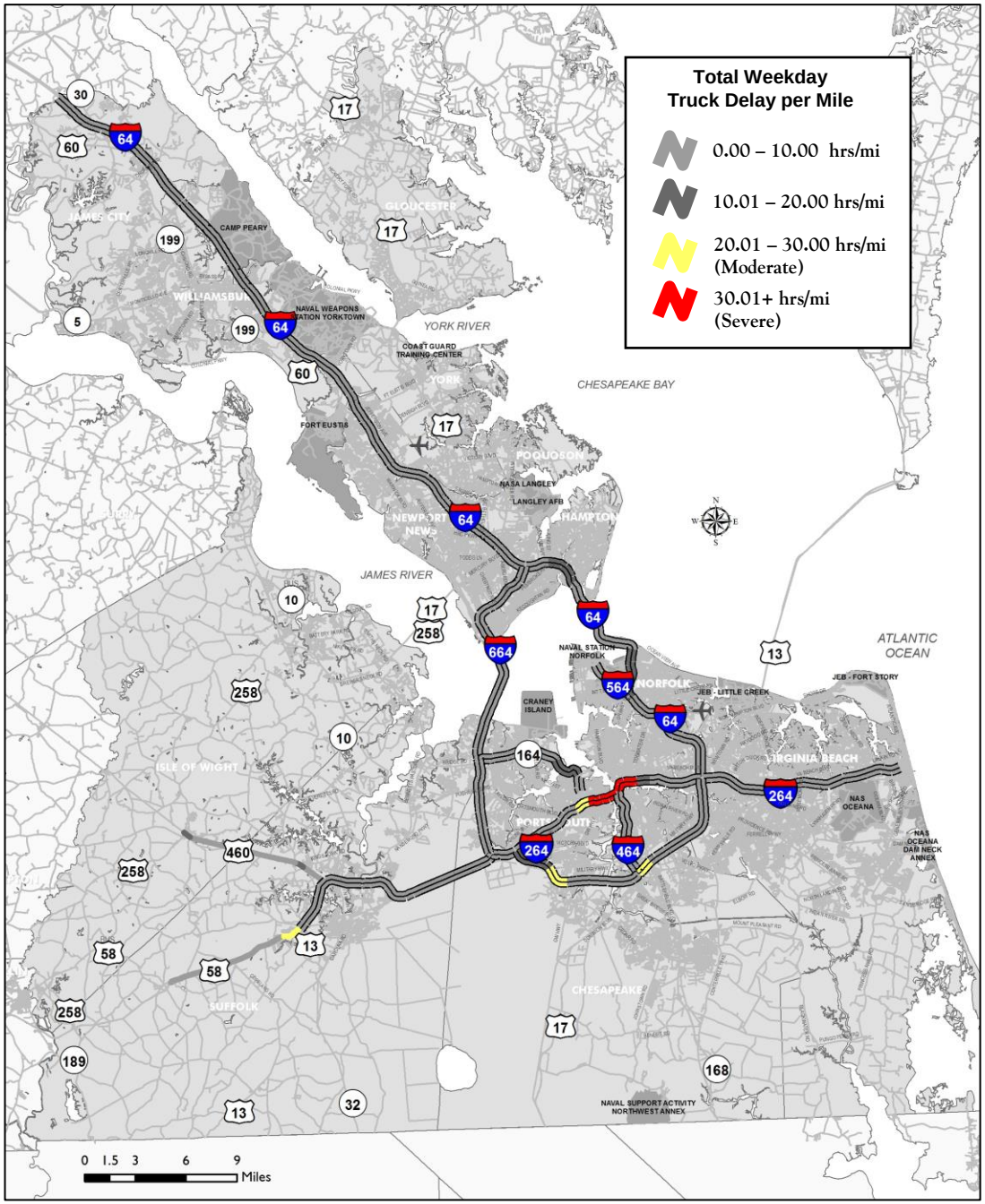


Freight Bottlenecks – 20-Year Forecast Comparison of Truck Delay (Hours)

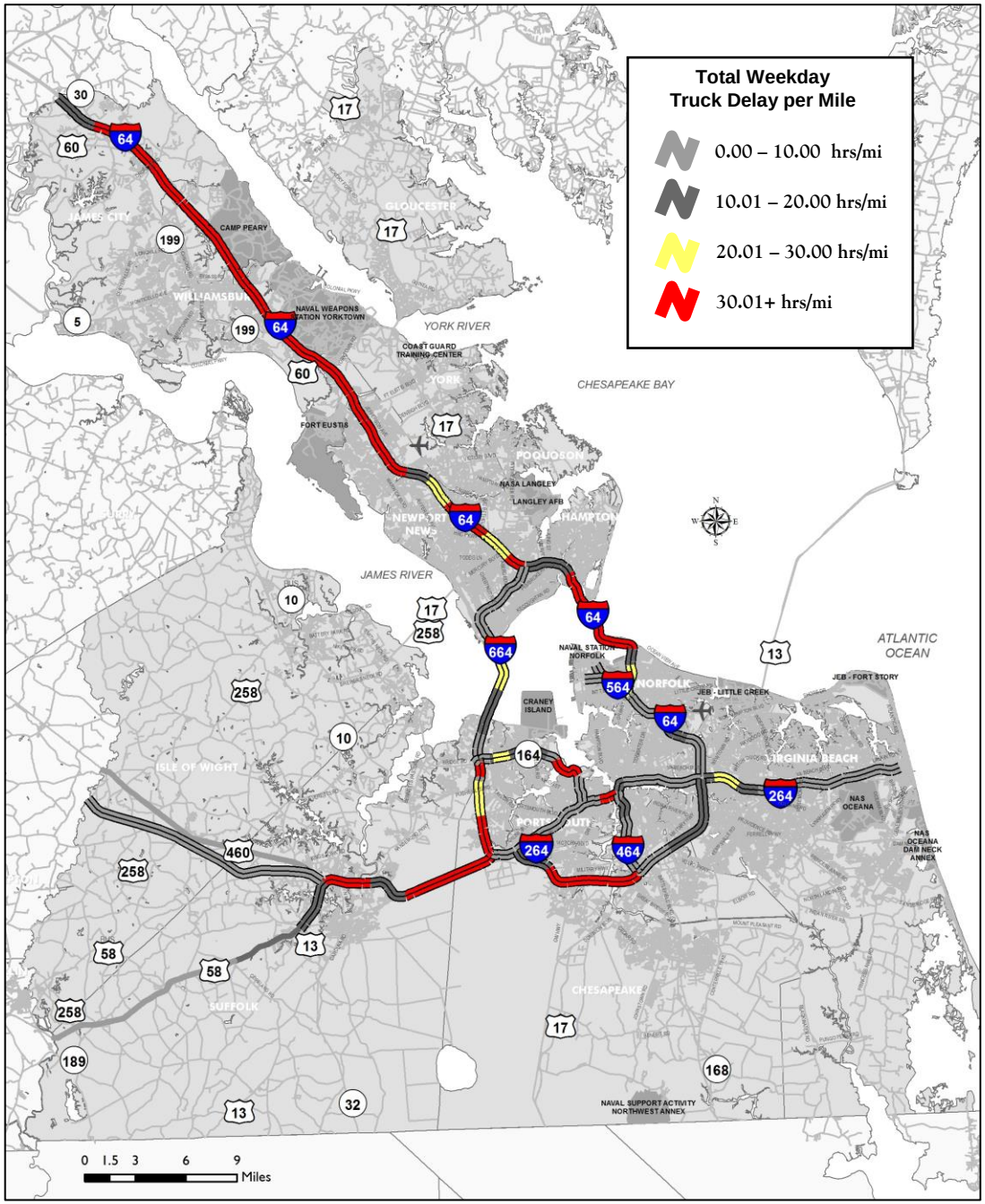
[24] 2010 Existing Total Weekday Truck Delays were calculated for each 15-minute interval for the Hampton Roads "Travel Time Network." The 2010 Existing total weekday truck delay included only delay that occurred between the hours of 5:30 am and 8:00 pm (14.5 hours) because INRIX data was not consistently available outside of that time period. This lack of data was due in part to INRIX's fleet vehicles for data, many of which are not travelling during overnight hours. It is assumed that little truck delay occurred in 2010 during the 8 pm to 5:30 am time period.

[25] Within the regional travel demand model, average congested and uncongested travel speeds (includes only recurring congestion) by roadway segment were produced for the 20-year weekday forecast for 4 time periods: 1) AM (6:00 am to 9:00am), midday (9:00 am to 3:00 pm), PM (3:00 pm to 6:00 pm), and night (6:00 pm to 6:00 am). These speeds were used to calculate total truck delay for each time period and summarized to produce the total weekday truck delay.

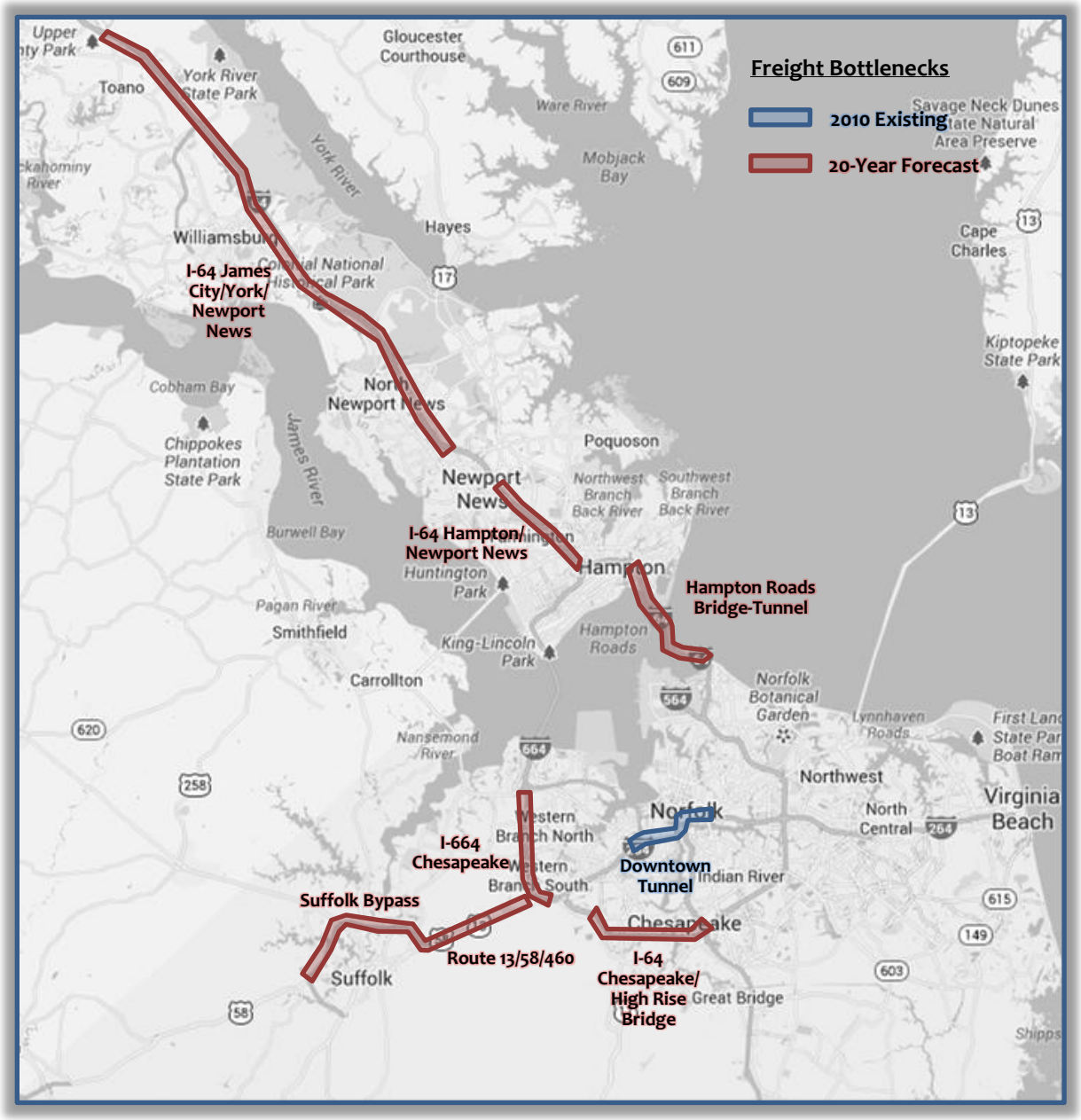
Map 8 – Truck Delay on Freight Network Highways – 2010 Existing



Map 9 – Truck Delay on Freight Network Highways – 20-Year Forecast



Map 10 – Freight Bottlenecks on Freight Network – 2010 Existing and 20-Year Forecast



Background map source: Google.

Freight Bottlenecks Addressed by Hampton Roads Transportation Fund (HRTF) Candidate Projects

On October 17, 2013, the HRTPO Board approved a resolution supporting a Hampton Roads Transportation Fund (HRTF) set of candidate projects (see **Map 11**). HB2313 legislation established new HRTF revenues for transportation to be expended solely for new construction projects on new or existing roads, bridges and tunnels in the localities with Hampton Roads (Planning District 23). The HRTPO resolution initiated the process of coordination with VDOT and FHWA to fund the HRTF package of projects. Upon completion of these projects, most of the freight bottlenecks that are identified within this section are expected to be improved (**Table 9** and **Map 12**).

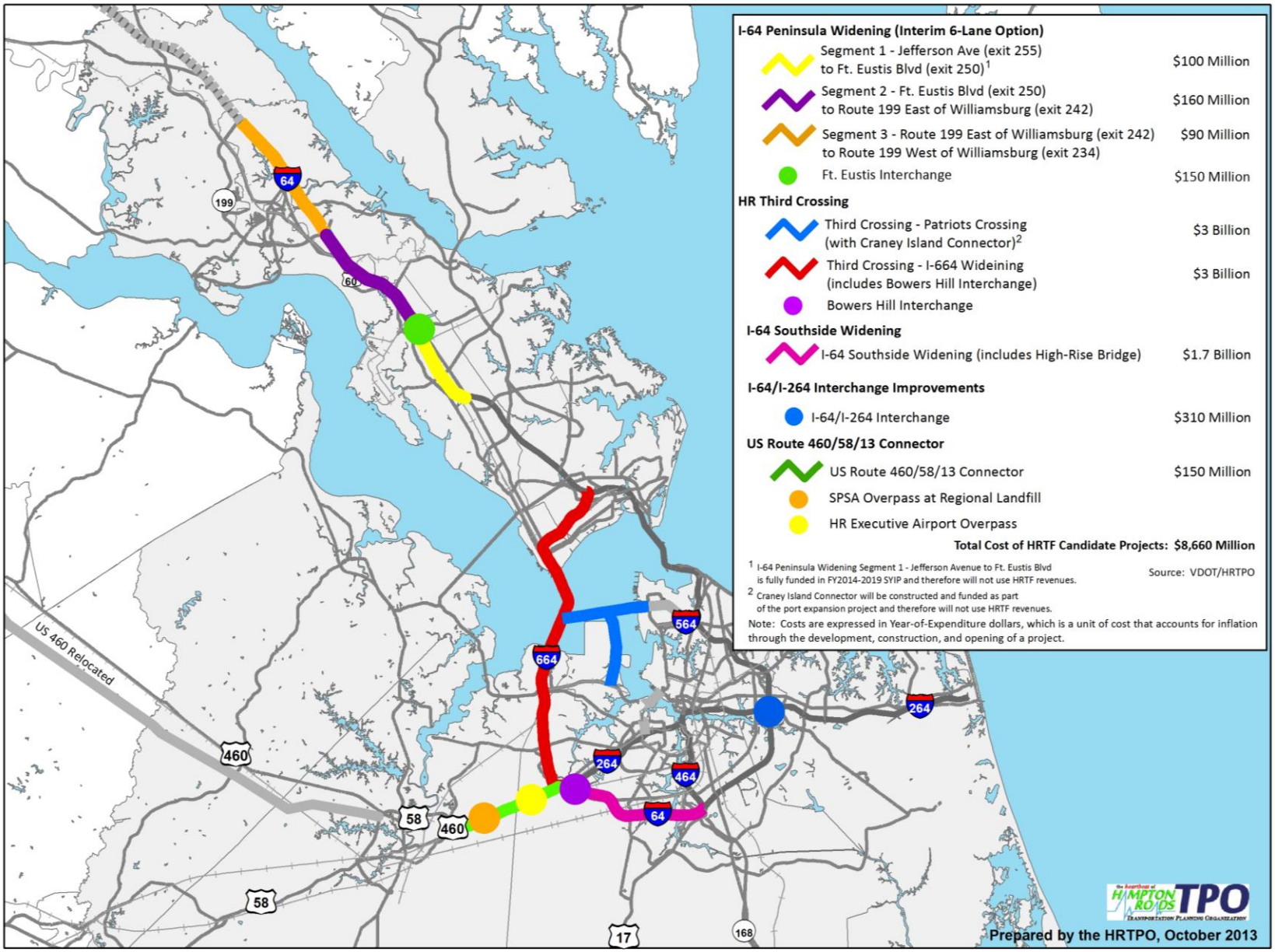
Table 9 – Freight Bottlenecks Addressed by HRTF Candidate Projects

Future Freight Bottleneck	Corresponding HRTF Project	Expected Improvement
I-64 JCC/YC/NN – Route 30 (James City County) to Jefferson Avenue (Newport News)	I-64 Peninsula Widening (6-Lane Option)	Partial
Route 13/58/460 & Suffolk Bypass – I-664 (Chesapeake) to Wilroy Road (Suffolk)	US Route 460/58/13 Connector including SPSA and Airport Interchanges	Partial
I-64 Chesapeake/High Rise Bridge – I-464 to Military Highway (Chesapeake)	I-64 Southside Widening including High Rise Bridge	Full
Hampton Roads Bridge Tunnel – Settlers Landing Road (Hampton) to 4th View Avenue (Norfolk)	Hampton Roads Third Crossing	Full
I-664 – Routes 13/58/460 (Chesapeake) to Bridge Road (Suffolk)	I-664 Widening including Bowers Hill Interchange (part of Hampton Roads Third Crossing)	Full
I-64 HAM/NN – JC Morris Boulevard (Newport News) to I-664 (Hampton)	N.A.	None

Remaining freight bottleneck highway segments that are not expected to be addressed by an HRTF project are as follows:

- **I-64 James City County/York County** – Route 30 (James City County) to Route 199/646 (York County) *(Total Weekday Truck Delay – 524 hours)*
- **Suffolk Bypass** – Pruden Boulevard to Wilroy Road (Suffolk) *(Total Weekday Truck Delay – 159 hours)*
- **I-64 Hampton/Newport News** – JC Morris Boulevard (Newport News) to I-664 (Hampton) *(Total Weekday Truck Delay – 191 hours)*

Map 11 – Hampton Roads Transportation Fund (HRTF) Candidate Projects



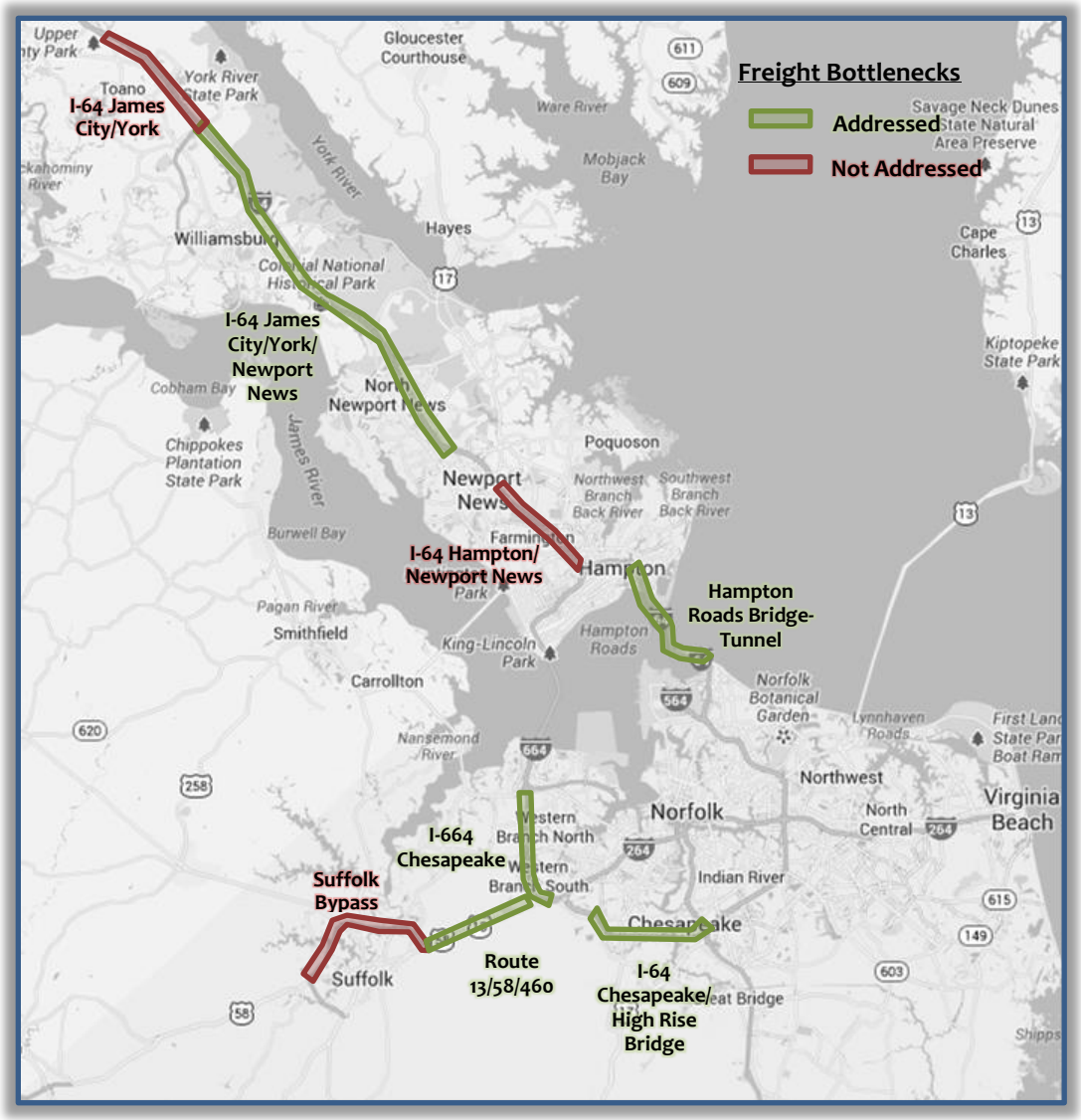
I. Bottlenecks addressed by an HRTF project

1. I-64 James City County/York County/Newport News
2. Hampton Roads Bridge-Tunnel
3. I-64 Chesapeake/High Rise Bridge
4. Route 13/58/460
5. I-664 Chesapeake

II. Bottlenecks not addressed by an HRTF project:

1. I-64 James City County/York County
2. Suffolk Bypass
3. I-64 Hampton/Newport News

Map 12 – Freight Bottlenecks Addressed by HRTF Candidate Projects



Background map source: Google.

EXISTING AND FUTURE TRUCK VOLUMES

As part of the new freight provisions within MAP-21, the USDOT must develop and maintain a National Freight Strategic Plan. Within the plan, the USDOT [in consultation with state DOTs and other stakeholders] must "forecast freight volumes" [§1115; 23 USC 167]. This section of the report provides the 2010 existing truck volumes and a 20-year forecast of truck volumes for those Hampton Roads highways that are anticipated to be part of the National Freight Network. Existing and future truck volumes within this section were obtained from the recently completed HRTPO study – Existing and Future Truck Delay in Hampton Roads[26].

WEEKDAY TRUCK VOLUMES – 2010 EXISTING

The 2010 existing weekday truck volumes, using the most recent Virginia Department of Transportation (VDOT) truck classification counts/estimates from 2009 to 2011[27], are provided on **Map 13** on the following page. A complete listing of all 2010 existing weekday truck volumes by roadway segment are provided in **Appendix B**.

Hampton Roads Peninsula

The roadway segment carrying the highest truck volumes on the Hampton Roads Peninsula is I-64 from J.C. Morris Boulevard (Newport News) to HRC Parkway (Hampton) with over 8,700 trucks per weekday.

Hampton Roads Southside

The highest truck volume location on the Hampton Roads Southside is currently in Chesapeake along I-664 from I-64/I-264 to Routes 13/58/460 with approximately 8,300 trucks per weekday.

WEEKDAY TRUCK VOLUMES – 20-YEAR FORECAST

The 20-year forecast weekday truck volumes were obtained from the recent HRTPO truck delay study, which used a "change method" from the Hampton Roads travel demand model (see **Map 14**)[28]. A complete listing of all 20-year forecast weekday truck volumes by roadway segment are provided in **Appendix B**.

[26] *Existing and Future Truck Delay in Hampton Roads*, HRTPO, September 2013.

[27] *Ibid*

[28] *Existing and Future Truck Delay in Hampton Roads*, HRTPO, September 2013, p. 15.

Hampton Roads Peninsula

I-64 on the Hampton Roads Peninsula is expected to carry the highest truck volumes in the future with the highest truck segments on I-64 in York County from Route 143 to Route 199 (east of Williamsburg) with approximately 10,600 trucks per weekday and on I-64 from J.C. Morris Boulevard (Newport News) to HRC Parkway (Hampton) with approximately 10,500 trucks per weekday.

Hampton Roads Southside

The highest truck volume location for the Hampton Roads Southside that is expected in 20 years is along I-64 in Chesapeake across the High Rise Bridge from I-464 to George Washington Highway with approximately 9,300 trucks per weekday.

CHANGE IN WEEKDAY TRUCK VOLUMES – 2010 EXISTING TO 20-YEAR FORECAST

The change in truck volumes from 2010 existing to the 20-year forecast is provided in **Map 15**. Calculations of changes from 2010 existing to the 20-year forecast for all highways that are anticipated to be part of the National Freight Network are provided in **Appendix B**.

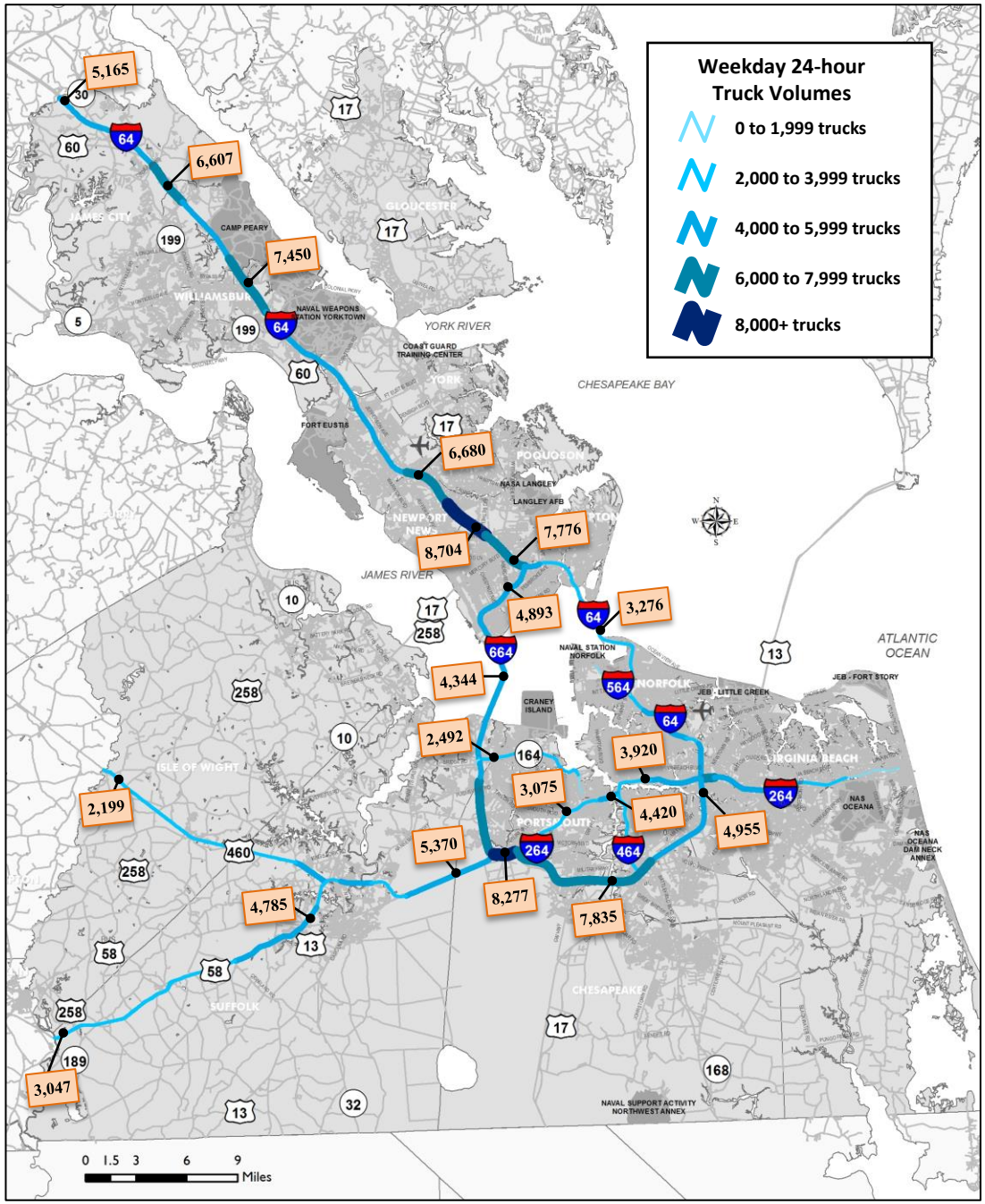
Hampton Roads Peninsula

An increase in truck travel is forecasted for the Peninsula. Truck volumes along I-64 between I-664 in Hampton and the New Kent county line are expected to increase significantly, from 1,700 to 3,500 trucks per weekday, depending on the location. Approximately 1,400 additional trucks are projected to use I-664 in Hampton in 20 years.

Hampton Roads Southside

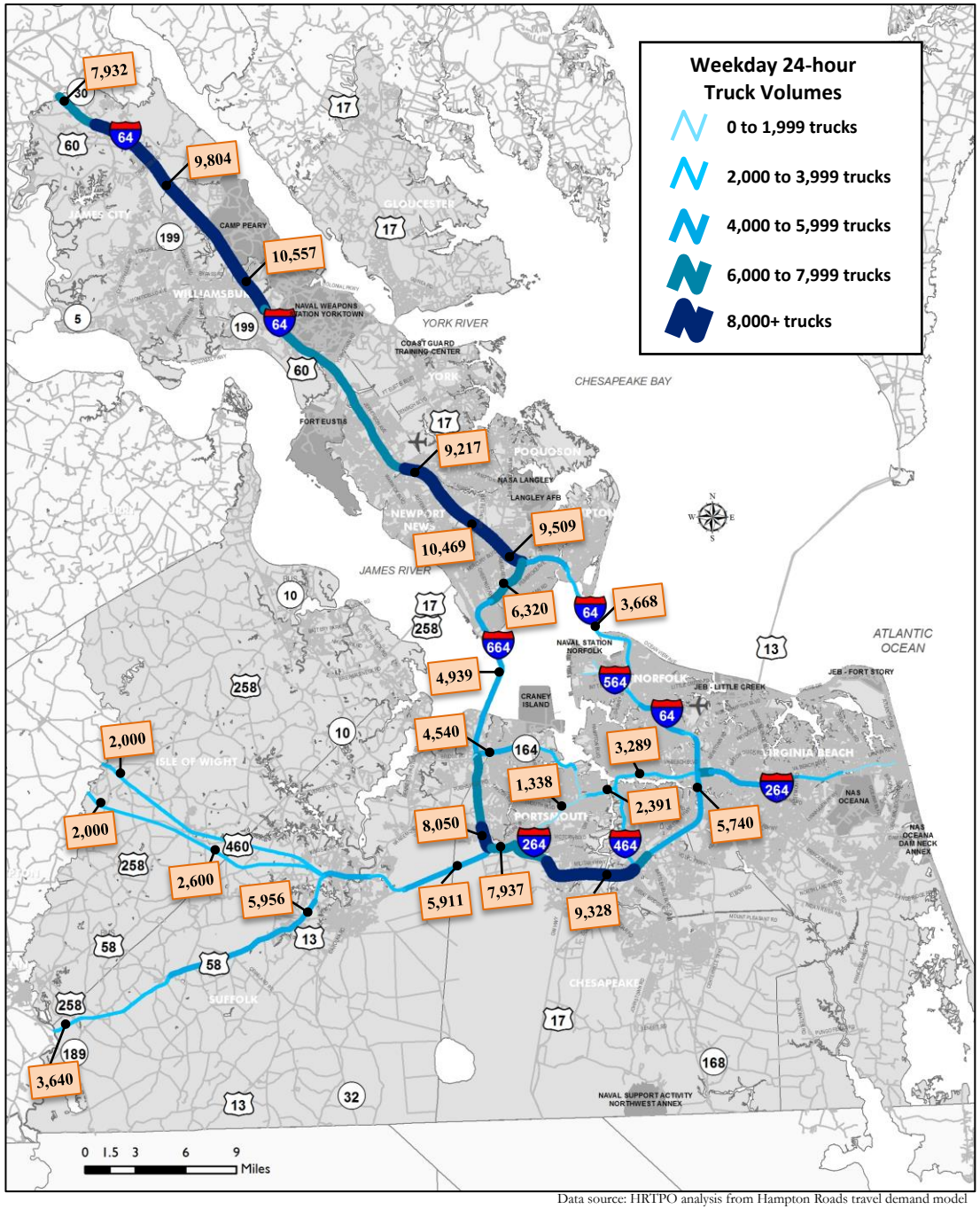
Tolls on the Downtown Tunnel and Midtown Tunnel are expected to shift truck travel on the Southside. Truck volumes along I-264 between I-64 in Norfolk and I-64/I-664 in Chesapeake (including the Downtown Tunnel) are expected to decrease significantly by approximately 500 to 2,000 trucks per weekday in 20 years. Nearly 1,500 additional trucks are projected to use I-64 in Chesapeake across the High-Rise Bridge in 20 years.

Map 13 – Weekday Truck Volumes on Freight Network – 2010 Existing



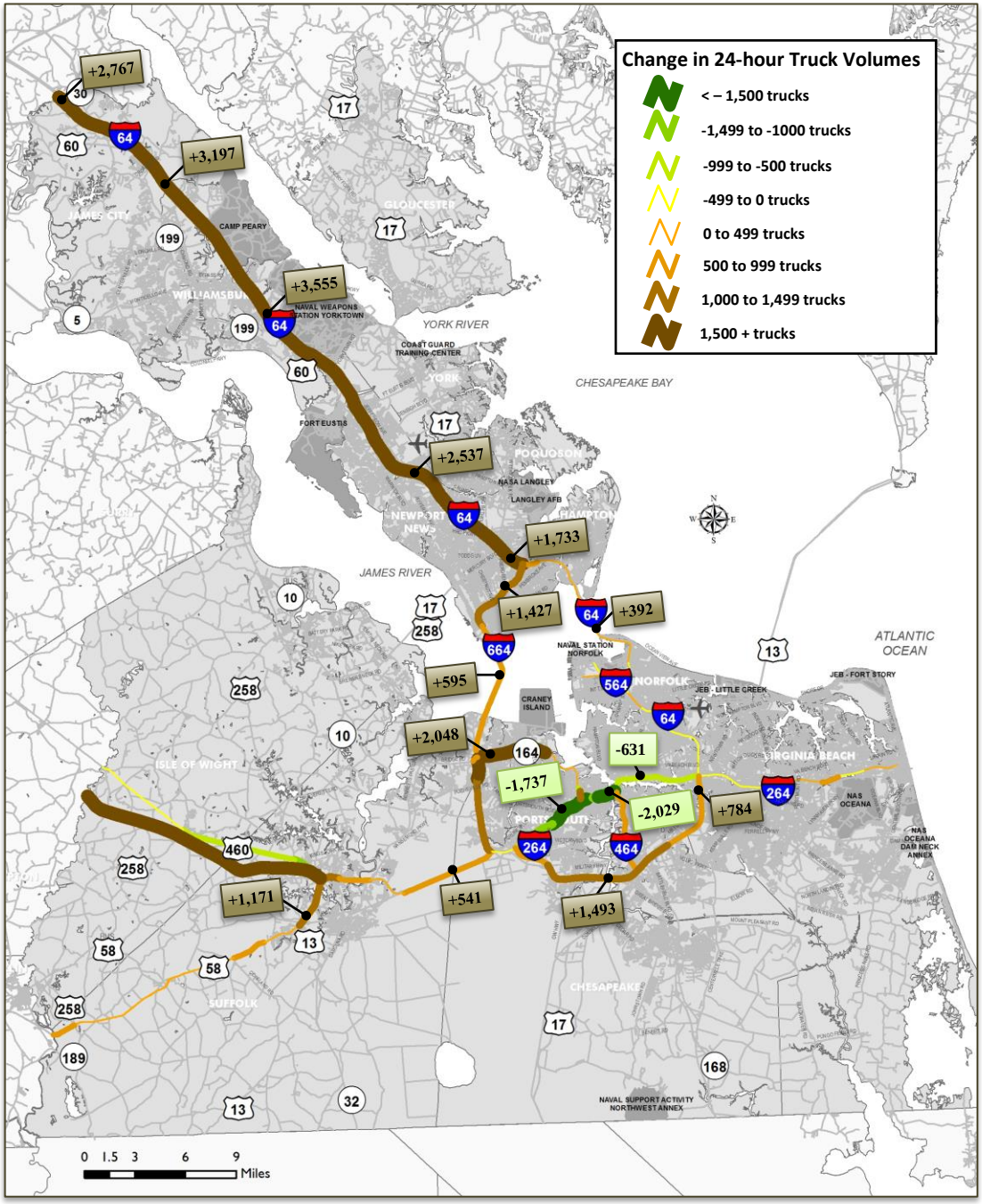
Data source: 2009-2011 VDOT classification counts/estimates

Map 14 – Weekday Truck Volumes on Freight Network – 20-Year Forecast



Data source: HRTPO analysis from Hampton Roads travel demand model

Map 15 – Change in Weekday Truck Volumes on Freight Network (2010 Existing to 20-Year Forecast)



Major Trade Gateways

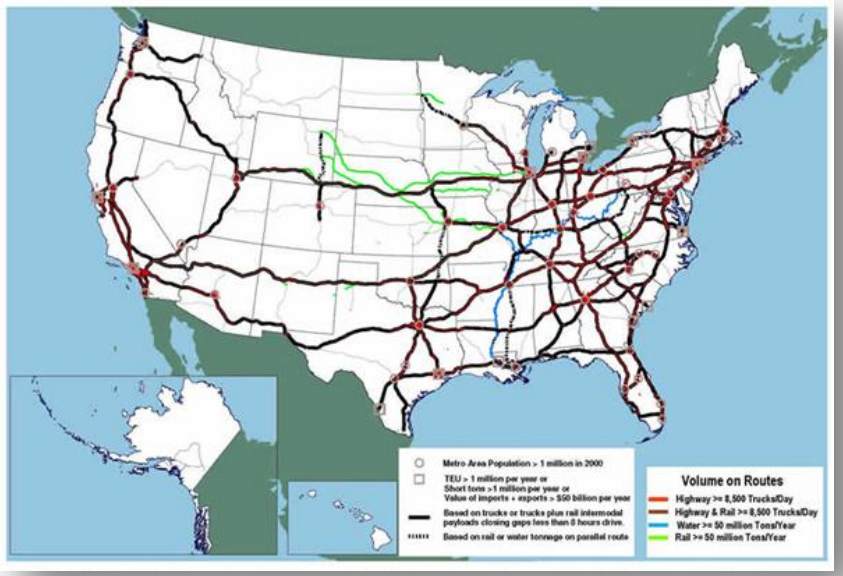
According to the MAP-21 freight provisions, the USDOT must "identify major trade gateways and national freight corridors" within a National Freight Strategic Plan within three years of enactment of MAP-21 legislation [§1115; 23 USC 167]. This section of the study identifies major trade gateways along the National Freight Network – Hampton Roads Base Network in preparation of this effort.

National, Gateway, and Intrastate Freight Corridors in Virginia

The Commonwealth of Virginia has recently identified three types of freight corridors within the state base on two criteria – (1) the importance of the freight corridors to nationwide freight mobility and (2) the connection to key international gateways for goods movement within the Commonwealth's transportation network[29]. The three Virginia corridor types are[30]:

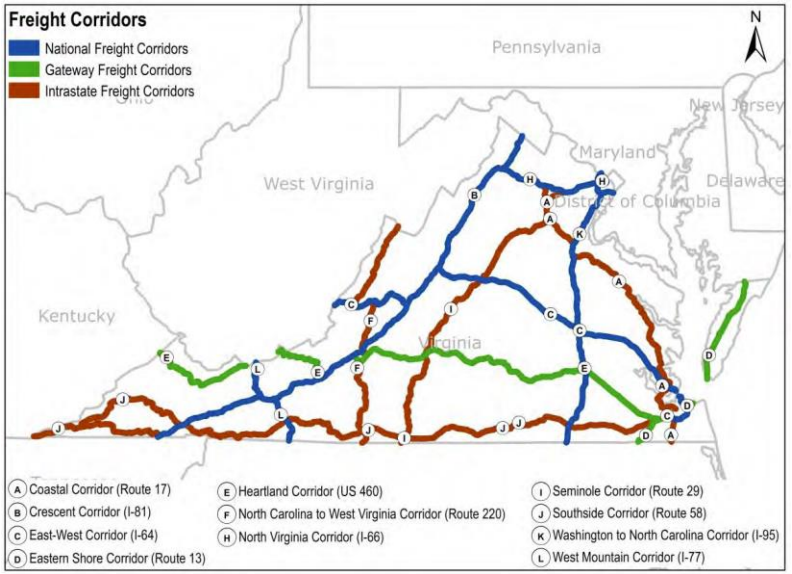
1. **National Freight Corridors** – carry the greatest volumes of freight measured in tonnage over the surface transportation system. Virginia's National Freight Corridors align with the USDOT Major Freight Corridors.
2. **Gateway Freight Corridors** – provide access to major entry points for multimodal cargo such as the Port facilities in Hampton Roads and the Mid-Atlantic Regional Spaceport. The cargo moving over these corridors is critical to the total economy even though the total volume tends to be lower than volume on the National Freight Corridors.
3. **Intrastate Freight Corridors** – primarily facilitate the movement of goods around Virginia and also connect flows to the National and Gateway Freight Corridors.

USDOT Major Freight Corridors



Notes: Highway & Rail is daily truck payload equivalents based on annual average daily truck traffic plus average daily intermodal service on parallel railroads. Average daily intermodal service is the annual tonnage moved by container-on-flatcar and trailer-on-flatcar service divided by 365 days per year and 16 tons per average truck payload.
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, 2008.

Virginia's Freight Corridors



Source: Draft Virginia Multimodal Freight Plan, 2013.

[29] *Draft Virginia Multimodal Freight Plan*, VDOT Office of Intermodal Planning and Investment, Prepared by Cambridge Systematics, Inc., November 2013, Ch. 4, p. 4-1 to 4-4.
[30] *Ibid.*

Major Trade Gateways in Hampton Roads – Existing

Many of the trucks that travel in Hampton Roads have origins and destinations located outside of the region. Trucks that travel across the Hampton Roads border use various regional gateways. The most heavily used gateway in Hampton Roads by trucks is I-64, which is the only Interstate route into and out of the region. As shown on **Map 13** in the previous section, approximately 5,165 trucks entered or exited the region via I-64 in 2010. The 2nd and 3rd highest gateways for trucks entering and exiting Hampton Roads are Route 58 and Route 460 – carrying approximately 3,047 trucks and 2,199 trucks respectively each weekday in 2010.

This study has identified a base network of Hampton Roads highways that are anticipated to be part of the National Freight Network. Within this network, I-64 (East-West Freight Corridor) has been identified within the draft Virginia Multimodal Freight Plan as a National Freight Corridor, Route 460 (Heartland Freight Corridor) as a Gateway Freight Corridor, and Route 58 (Southside Freight Corridor) as an Intrastate Freight Corridor[31]. Given that Route 58 is the second highest truck gateway in Hampton Roads (39% busier than Route 460) and that it provides access via Interstates I-95 and I-85 to all states south of the Virginia border to/from the Port facilities in Hampton Roads, HRTPO staff recommends that the eastern portion of Route 58 (east of I-85) be designated as a Gateway Freight Corridor[32]. Staff concurs with the state's corridor designations for I-64 and Route 460.

Based on existing truck volumes in Hampton Roads and in accordance with Virginia's categorization of freight corridors[33], the following major trade gateways have been identified by HRTPO staff for existing freight movement (see **Map 16**):

1. I-64 in James City County (National Freight Corridor)
2. Route 58 in Suffolk (Gateway Freight Corridor)
3. Route 460 in Isle of Wight County (Gateway Freight Corridor)

It is important to note that other corridors within Hampton Roads have been identified by the Commonwealth of Virginia as Gateway Freight Corridors (i.e. Route 13) and Intrastate Freight Corridors (i.e. Route 17). Even though these corridors play an important role in freight movement, they are not identified as major trade gateways in Hampton Roads as they are less critical on a national level.

Major Trade Gateways in Hampton Roads – Future

Trucks are anticipated to remain the primary mover of domestic freight in and out of Hampton Roads over the next 20 to 30 years, according to Federal Highway Administration's (FHWA) Freight Analysis Framework (FAF)[34]. I-64 on the Hampton Roads Peninsula is expected to remain the primary trade gateway in 20 years carrying over 7,900 trucks per weekday, as shown on **Map 14** in the previous section. The 2nd highest trade gateway for trucks in the next 20 years is expected to be Route 58, carrying approximately 3,600 trucks each weekday. The 3rd major trade gateway in 20 years is anticipated to be the Commonwealth Connector (new Route 460) with an estimated 2,000 trucks per weekday. Given that the Commonwealth Connector will operate as a limited access highway, it will become the major trade gateway for the Route 460 corridor in the future.

Based on 20-year forecasted truck volumes in Hampton Roads and in accordance with Virginia's categorization of freight corridors, the following major trade gateways have been identified by HRTPO staff for future freight movement (see **Map 17**):

1. I-64 in James City County (National Freight Corridor)
2. Route 58 in Suffolk (Gateway Freight Corridor)
3. Commonwealth Connector (new Route 460) in Isle of Wight County (Gateway Freight Corridor)

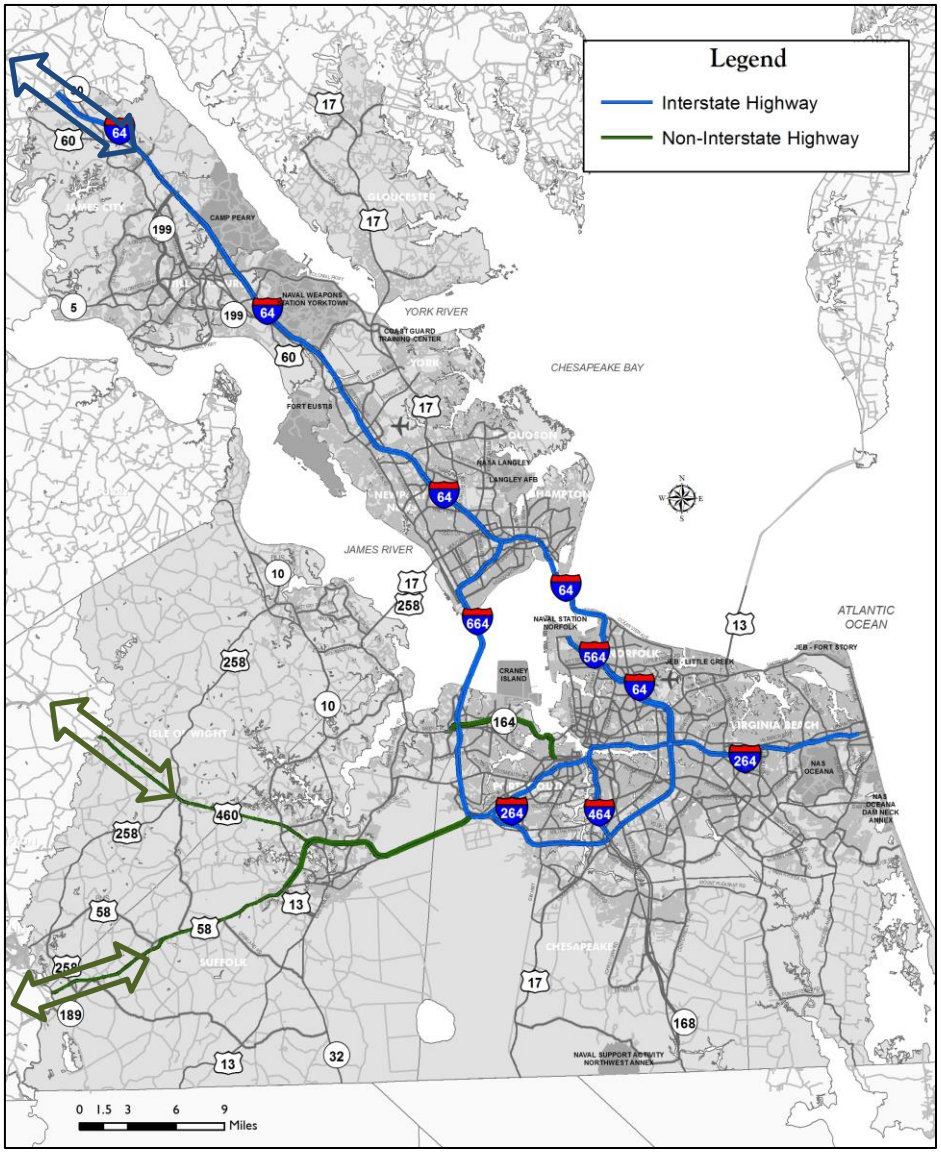
[31] *Ibid.*

[32] This recommendation was submitted by HRTPO staff on the DRAFT Virginia Multimodal Freight Plan, November 2013.

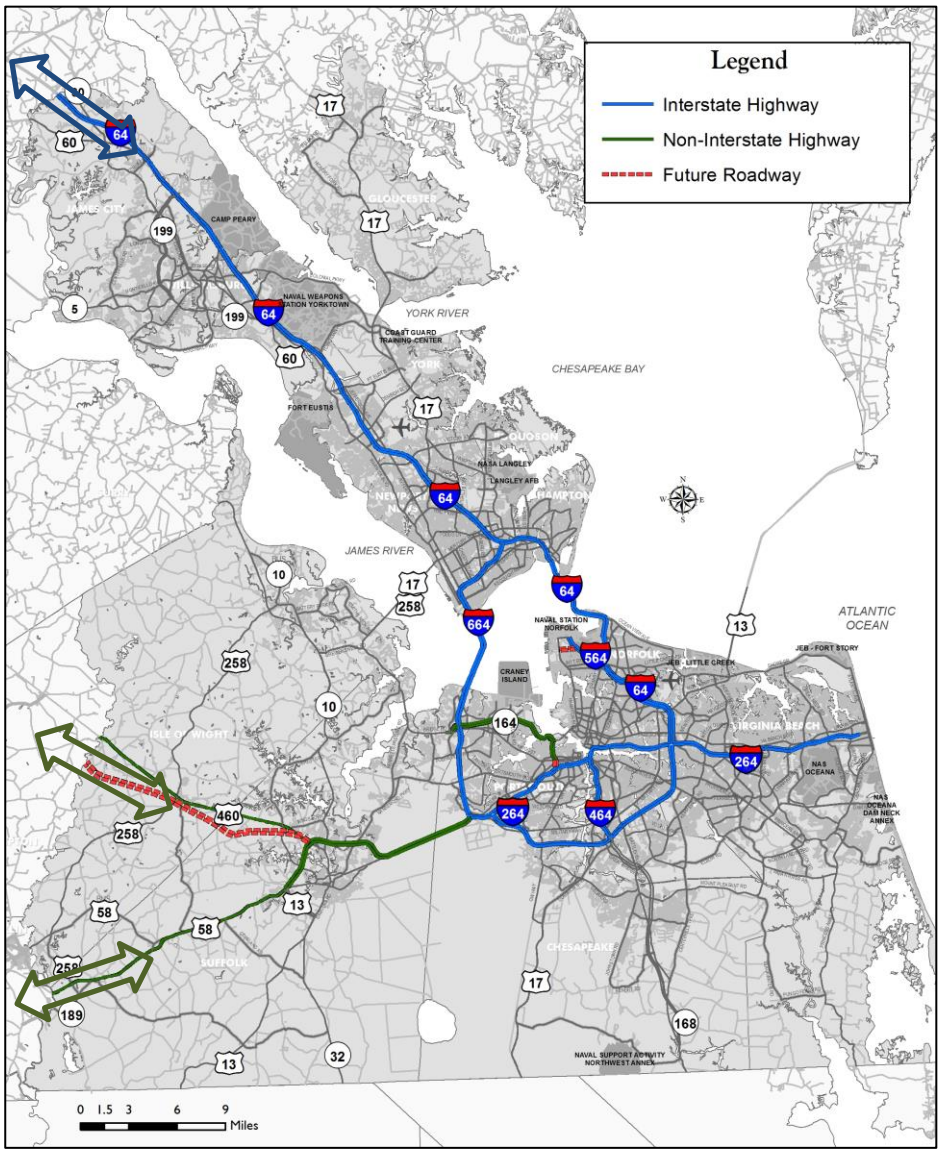
[33] As modified by HRTPO staff recommendation.

[34] *Hampton Roads Regional Freight Study: 2012 Update*, HRTPO, September 2012, p. 11.

Map 16 – Major Trade Gateways in Hampton Roads – Existing



Map 17 – Major Trade Gateways in Hampton Roads – Future



Recommendations and Next Steps

Recommendations

MAP-21 legislation included a number of provisions to improve the condition and performance of the National Freight Network and support investment in freight-related surface transportation projects. It places strong emphasis on freight movement and requires participation from States, Metropolitan Planning Organizations (MPOs), and other stakeholders. States and MPOs that are organized, with data and analyses, will better position themselves for potential funding initiatives and benefit in the next authorization. Establishment of the National Freight Network under MAP-21 is underway and is not expected to be finalized until mid-2014[35].

This study analyzed Hampton Roads highways that are anticipated to be part of the National Freight Network, addressing several required elements of the National Freight Strategic Plan [the Hampton Roads portion] where data is available. Completing these items for the Hampton Roads region will give Virginia a head start in completing these new MAP-21 requirements and may serve as a model for other regions in Virginia to follow. Upon approval by the HRTPO Board, the findings of this regional study will be forwarded to the Virginia Department of Transportation (VDOT) and the Federal Highway Administration (FHWA) in order to position Hampton Roads for future freight infrastructure funding.

Based on the analysis presented in this report, HRTPO staff prepared the following set of recommendations in order to improve future freight movement along the National Freight Network – Hampton Roads Base Network:

National Freight Network

- It is recommended that FHWA include all of the roadways identified in **Map 1** on page 13 (National Freight Network – Hampton Roads Base Network) in the final designation of the National Freight Network. Roadways in Hampton Roads that were identified in this study include:
    - all interstate highways
    - non-interstate highways (Route 58, Route 460/Pruden Boulevard, Suffolk Bypass, Western Freeway, MLK Freeway), and
    - future roadways (Commonwealth Connector – new Route 460, MLK Extension, Intermodal Connector).

Congested Roadways

- HRTPO staff intends to evaluate, develop, and apply congestion mitigation strategies to all severely congested (Level of Service E or F) segments of the National Freight Network – Hampton Roads Base Network in the next Hampton Roads Congestion Management Process (CMP) update.

Deficient Bridges

- It is recommended that the bridge owners (VDOT or Hampton Roads localities) rehabilitate or replace the following Structurally Deficient bridges that are located on the National Freight Network – Hampton Roads Base Network:
    - I-264 over Lynnhaven Parkway in Virginia Beach (Federal ID: 22228)
    - I-64 Eastbound over Northampton Boulevard in Norfolk (Federal ID: 20858)
    - I-64 Eastbound Ramp over Northampton Boulevard in Norfolk (Federal ID: 20856)
    - Hampton Roads Bridge-Tunnel Eastbound in Hampton (Federal ID: 20352)
- It is recommended that the bridge owners (VDOT or Hampton Roads localities) closely monitor the remaining 106 Functionally Obsolete bridges. It is recommended that priority be given to these facilities for rehabilitation or replacement, if necessary.

Vertical Clearances below Preferred Height

- It is recommended that VDOT use a minimum vertical clearance of 14 feet as tunnels are constructed or replaced at the following locations:
    - Downtown Tunnel Eastbound under Southern Branch Elizabeth River in Norfolk (Federal ID: 20952)

[35] *Overview of the Draft Highway Primary Freight Network*, US Department of Transportation, Federal Highway Administration, Talking Freight Seminar Presentation, November 20, 2013.

- Downtown Tunnel Westbound under Southern Branch Elizabeth River in Norfolk (Federal ID: 20951)
- Hampton Roads Bridge-Tunnel Westbound tunnel under Hampton Roads in Hampton (Federal ID: 20354)
- Midtown Tunnel under Elizabeth River in Norfolk (Federal ID: 20808)

- It is recommended that VDOT use a minimum vertical clearance of 16 feet as Interstate bridge structures are constructed or replaced at the following locations:
  - I-64 over Lasalle Avenue in Hampton (Federal ID: 20326)
  - I-64 Eastbound over Ramp from Northampton Boulevard in Norfolk (Federal ID: 20852)
  - I-64 Westbound over Ramp from Northampton Boulevard in Norfolk (Federal ID: 20854)
  - I-64 Eastbound Ramp over Northampton Boulevard in Norfolk (Federal ID: 20856)
  - I-64 Eastbound over Northampton Boulevard in Norfolk (Federal ID: 20858)
  - I-64 Westbound over Northampton Boulevard in Norfolk (Federal ID: 20860)
  - Admiral Taussig Boulevard over I-564 Ramps in Norfolk (Federal ID: 21021)
  - I-564 Southbound over Granby Street in Norfolk (Federal ID: 21072)
  - Court Street over I-264 Westbound in Portsmouth (Federal ID: 21193)
  - I-264 Eastbound Ramp over Frederick Boulevard in Portsmouth (Federal ID: 21222)
  - I-264 over Frederick Boulevard in Portsmouth (Federal ID: 21229)
  - I-264 over Ramp from Frederick Boulevard in Portsmouth (Federal ID: 21235)
  - I-264 over Victory Boulevard in Portsmouth (Federal ID: 21237)
  - I-264 over Effingham Street in Portsmouth (Federal ID: 21240)
  - I-264 over London Bridge Road in Virginia Beach (Federal ID: 22232)
  - I-264 over Birdneck Road in Virginia Beach (Federal ID: 22243)

Inadequate Roadway Lane Widths

- If the Commonwealth Connector (new Route 460) is not built[36], it is recommended that VDOT widen the lanes of existing Route 460 (average lane widths of 10 feet) to a minimum of 12 feet in order to safely accommodate commercial vehicles:
  - Route 460 in Isle of Wight County from the Southampton County line to the Suffolk City line
  - Pruden Boulevard (Route 460) in Suffolk from the Isle of Wight County line to the Suffolk Bypass

Poor Pavement Conditions

- It is recommended that VDOT continue to improve all roadway pavement sections in Hampton Roads with CCI values below 60 (poor and very poor), which are considered "deficient".

Freight Bottlenecks on Highways

- On October 17, 2013, the HRTPO Board approved a resolution supporting a Hampton Roads Transportation Fund (HRTF) set of candidate projects (see **Map 11** on page 38). Upon completion of these projects, three of the six future freight bottlenecks that are identified within this study are expected to be fully improved (see **Table 9** on page 37). It is recommended that the HRTPO Board consider including projects in its next Long-Range Transportation Plan that address the remaining three future freight bottlenecks in Hampton Roads:
  - I-64 James City County/York County – Route 30 (James City County) to Route 199/646 (York County) (Total Weekday Truck Delay – 524 hours)
  - Suffolk Bypass – Pruden Boulevard to Wilroy Road (Suffolk) (Total Weekday Truck Delay – 159 hours)
  - I-64 Hampton/Newport News – JC Morris Boulevard (Newport News) to I-664 (Hampton) (Total Weekday Truck Delay – 191 hours)
- It is recommended that VDOT and other MPOs/Planning Districts in Virginia determine existing and future freight bottlenecks on highways using a similar methodology[37] as the

[36] Gov.-elect Terry McAuliffe recommended additional study before moving forward on the roadway project. The project also requires the approval by the Army Corps of Engineers due to destruction of wetlands. Virginian Pilot, December 5, 2013.

[37] *Existing and Future Truck Delay in Hampton Roads*, HRTPO, September 2013.

HRTPO (i.e. using truck component of VDOT's regional travel demand models and truck counts) in order to compare and prioritize freight bottlenecks across the entire state.

Forecast Freight Volumes

- HRTPO staff intends to update the 20-year forecast weekday truck volumes in Hampton Roads on a regular basis (e.g. 5-year cycle) as conditions change and to be used as input to future versions of the HRTPO Long-Range Transportation Plan, the Virginia Multimodal Freight Plan, and the National Freight Strategic Plan.

Major Trade Gateways

- It is recommended that the major trade gateways identified in this study be included in the Virginia Multimodal Freight Plan and the National Freight Strategic Plan for the existing highway network[38]:
  - I-64 in James City County (National Freight Corridor)
  - Route 58 in Suffolk (Gateway Freight Corridor)[39]
  - Route 460 in Isle of Wight County (Gateway Freight Corridor)

NEXT STEPS

Upon approval of this study by the HRTPO Board, the HRTPO staff plans to forward it to VDOT and FHWA to assist with the final development of the National Freight Network and to serve as input to the National Freight Strategic Plan and the Freight Conditions and Performance Report. This study will also serve as an important framework for local freight infrastructure improvements.

HRTPO staff intends to work with the Freight Transportation Advisory Committee (advisory committee for the HRTPO Board) to comment on the draft National Freight Network (as parts are released by USDOT) to include the National Freight Network – Hampton Roads Base Network – identified in this study – in the final designation of the National Freight Network. Furthermore, the HRTPO staff intends on updating this document once the National Freight Network is finalized.

[38] For the future highway network, HRTPO staff recommends that the Commonwealth Connector (new Route 460) in Isle of Wight County be designated as a major trade gateway in place of Route 460, if it is built.

[39] HRTPO staff recommended that the eastern portion of Route 58 (east of I-85) be designated as a Gateway Freight Corridor – this comment was submitted on the DRAFT Virginia Multimodal Freight Plan, November 2013.

APPENDICES

APPENDIX A:
TRAFFIC VOLUMES, SPEEDS, AND CONGESTION
(NATIONAL FREIGHT NETWORK – HAMPTON ROADS BASE NETWORK)

The following tables show the results from the recently published Volumes, Speeds, and Congestion on Major Roadways in Hampton Roads[40]. Weekday traffic volumes have been updated from the HRTPO Congestion Management Process (CMP) database through August 2013.

[40] *Volumes, Speeds, and Congestion on Major Roadways in Hampton Roads*, HRTPO, June 2013.

LEGEND – TRAFFIC VOLUME, SPEED, AND CONGESTION DATA TABLES

JURIS NAME
Includes the names of each jurisdiction as shown below:

CHES – Chesapeake
FR – Franklin
GLO – Gloucester County
HAM – Hampton
IW – Isle of Wight County
JCC – James City County
NN – Newport News
NOR – Norfolk
POQ – Poquoson
PORT – Portsmouth
SH – Southampton County
SUF – Suffolk
SUR – Surry County
VB – Virginia Beach
WMB – Williamsburg
YC – York County

WEEKDAY TRAFFIC VOLUMES
These columns show the most recent weekday traffic count by roadway segment from the HRTPO Congestion Management Process (CMP) database through August 2013.

SPEED
Speed data is collected by INRIX on many roadways in Hampton Roads. The yearly average speeds are calculated by direction for each of the four hours in the morning (AM) peak period (5-9 am) and the afternoon (PM) peak period (3-7 pm). These speeds represent an average of weekdays (Tuesdays-Thursdays) throughout 2012.

This column shows the lowest of the four hourly average speeds that occur in each direction in each peak period.

A "-" indicates that INRIX speed data is not available for that segment.

TRAVEL TIME INDEX (TTI)
The travel time index is calculated by INRIX for each roadway segment where speed data is collected. The TTI represents the ratio of travel time in the peak hour to travel time in free-flow conditions. A TTI of 1.20 means a 20-minute free flow trip takes 24 minutes in the peak hour.

The yearly average travel time index is calculated for each of the four hours in the AM and PM peak period. This column shows the highest of these four TTIs that occur in each direction. It occurs during the same hour as the speed shown in the previous column.

A "-" indicates that travel time index data is not available for that segment.

CONGESTION LEVEL
Congestion levels are shown in these columns for the AM and PM peak hour. Congestion levels are based on the travel time index when speed data is available, or Highway Capacity Manual (HCM) level of service (LOS) methods for roadways without speed data.

Congestion levels for roadways **with** speed data are shown based on the table below:

Congestion Level		Freeway	Arterial
Low	LOW	TTI < 1.15	TTI < 1.25
Moderate	MOD	1.15 ≤ TTI < 1.3	1.25 ≤ TTI < 1.4
Severe	SEV	TTI ≥ 1.3	TTI ≥ 1.4

Congestion levels for roadways **without** speed data are shown based on the table below:

Congestion Level		HCM LOS
Low	LOW	A-C
Moderate	MOD	D
Severe	SEV	E-F

JURIS NAME	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	WEEKDAY TRAFFIC VOLUMES*			2012 SPEED AND CONGESTION DATA											
								AM PEAK HOUR						PM PEAK HOUR					
								SPEED (mph)		TRAVEL TIME INDEX		CONGESTION LEVEL		SPEED (mph)		TRAVEL TIME INDEX		CONGESTION LEVEL	
					ONE-WAY EXISTING	TWO-WAY EXISTING	COUNT YEAR	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
PORT	M L K FREEWAY	HIGH ST	LONDON BLVD	NB	5,951	12,796	2010	-	-	-	-	LOW		-	-	-	-	LOW	
				SB	6,844		2010	-	-	-	-	LOW		-	-	-	-	LOW	
PORT	M L K FREEWAY	LONDON BLVD	WESTERN FREEWAY/MIDTOWN TUNNEL	NB	18,723	36,989	2012	30	-	1.82	-	SEV	-	39	-	1.30	-	SEV	-
				SB	18,266		2012	-	48	-	1.07	-	LOW	-	48	-	1.06	-	LOW
SUF	PRUDEN BLVD	ISLE OF WIGHT CL	LAKE PRINCE DR			14,998	2011	52	51	1.01	1.02	LOW	LOW	52	50	1.01	1.04	LOW	LOW
SUF	PRUDEN BLVD	LAKE PRINCE DR	KINGS FORK RD			18,251	2011	42	42	1.09	1.13	LOW	LOW	43	43	1.08	1.12	LOW	LOW
SUF	PRUDEN BLVD	KINGS FORK RD	SUFFOLK BYPASS			18,209	2011	39	40	1.07	1.15	LOW	LOW	40	40	1.04	1.14	LOW	LOW
SUF	PRUDEN BLVD	SUFFOLK BYPASS	GODWIN BLVD			10,587	2011	38	38	1.11	1.11	LOW	LOW	36	38	1.16	1.10	LOW	LOW
VB	I-64	NORFOLK CL	INDIAN RIVER RD	EB	74,977	148,090	2012	61	-	0.98	-	LOW	-	49	-	1.23	-	MOD	-
				WB	73,113		2012	-	49	-	1.27	-	MOD	-	50	-	1.24	-	MOD
VB	I-64	INDIAN RIVER RD	CITY LINE RD/CHESEAPEAKE CL	EB	69,141	134,585	2012	62	-	0.99	-	LOW	-	61	-	1.00	-	LOW	-
				WB	65,444		2012	-	57	-	1.08	-	LOW	-	61	-	1.01	-	LOW

Appendix A: Traffic Volumes, Speeds, and Congestion (National Freight Network – Hampton Roads Base Network)

JURIS NAME	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	WEEKDAY TRAFFIC VOLUMES*			2012 SPEED AND CONGESTION DATA											
								AM PEAK HOUR						PM PEAK HOUR					
								SPEED (mph)		TRAVEL TIME INDEX		CONGESTION LEVEL		SPEED (mph)		TRAVEL TIME INDEX		CONGESTION LEVEL	
					ONE-WAY EXISTING	TWO-WAY EXISTING	COUNT YEAR	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
CHES	I-64	CITY LINE RD/VA BEACH CL	GREENBRIER PKWY	EB	69,141	134,585	2012	62	-	0.99	-	LOW	-	61	-	1.00	-	LOW	-
				WB	65,444		2012	-	57	-	1.08	-	LOW	-	61	-	1.01	-	LOW
CHES	I-64	GREENBRIER PKWY	BATTLEFIELD BLVD	EB	67,141	133,314	2012	62	-	0.99	-	LOW	-	54	-	1.18	-	MOD	-
				WB	66,173		2012	-	63	-	1.00	-	LOW	-	64	-	0.99	-	LOW
CHES	I-64	BATTLEFIELD BLVD	I-464	EB	60,542	111,564	2012	61	-	1.00	-	LOW	-	36	-	1.89	-	SEV	-
				WB	51,022		2008	-	62	-	0.99	-	LOW	-	63	-	0.98	-	LOW
CHES	I-64	I-464	GEORGE WASHINGTON HWY	EB	44,030	88,335	2012	61	-	0.98	-	LOW	-	51	-	1.23	-	MOD	-
				WB	44,305		2012	-	58	-	1.05	-	LOW	-	58	-	1.05	-	LOW
CHES	I-64	GEORGE WASHINGTON HWY	MILITARY HWY	EB	39,243	77,462	2012	63	-	0.97	-	LOW	-	59	-	1.05	-	LOW	-
				WB	38,219		2012	-	37	-	1.73	-	SEV	-	49	-	1.28	-	MOD
CHES	I-64	MILITARY HWY	I-264&664	EB	38,714	75,460	2012	62	-	0.98	-	LOW	-	57	-	1.09	-	LOW	-
				WB	36,746		2012	-	50	-	1.26	-	MOD	-	54	-	1.16	-	MOD
CHES	I-264	I-64&664	WCL PORTSMOUTH	EB	27,749	56,970	2012	61	-	0.99	-	LOW	-	61	-	1.00	-	LOW	-
				WB	29,221		2009	-	61	-	0.99	-	LOW	-	60	-	1.00	-	LOW
CHES	I-464	I-64	MILITARY HWY	NB	30,101	58,136	2012	56	-	1.06	-	LOW	-	57	-	1.03	-	LOW	-
				SB	28,035		2012	-	58	-	1.06	-	LOW	-	60	-	1.03	-	LOW
CHES	I-464	MILITARY HWY	FREEMAN AVE	NB	28,298	49,565	2012	63	-	1.01	-	LOW	-	62	-	1.02	-	LOW	-
				SB	21,267		2012	-	59	-	1.02	-	LOW	-	62	-	0.98	-	LOW
CHES	I-464	FREEMAN AVE	POINDEXTER ST	NB	26,728	49,711	2012	62	-	1.03	-	LOW	-	62	-	1.02	-	LOW	-
				SB	22,983		2012	-	60	-	1.05	-	LOW	-	63	-	1.01	-	LOW
CHES	I-464	POINDEXTER ST	NORFOLK CL	NB	27,877	51,569	2012	48	-	1.30	-	SEV	-	58	-	1.07	-	LOW	-
				SB	23,692		2012	-	59	-	1.05	-	LOW	-	61	-	1.01	-	LOW
CHES	I-664	I-64 & I-264	ROUTES 13/58/460	SB	58,490	119,660	2012	61	-	0.99	-	LOW	-	61	-	0.99	-	LOW	-
				NB	61,170		2009	-	62	-	0.99	-	LOW	-	55	-	1.14	-	LOW
CHES	I-664	ROUTES 13/58/460	DOCK LANDING RD	SB	46,506	92,548	2012	60	-	1.03	-	LOW	-	61	-	1.01	-	LOW	-
				NB	46,042		2012	-	63	-	0.99	-	LOW	-	59	-	1.06	-	LOW
CHES	I-664	DOCK LANDING RD	PORTSMOUTH BLVD	SB	45,747	92,201	2012	62	-	1.02	-	LOW	-	62	-	1.02	-	LOW	-
				NB	46,454		2012	-	63	-	0.99	-	LOW	-	63	-	1.00	-	LOW
CHES	I-664	PORTSMOUTH BLVD	PUGHSVILLE RD	SB	43,902	87,535	2012	63	-	1.00	-	LOW	-	60	-	1.06	-	LOW	-
				NB	43,633		2012	-	63	-	0.99	-	LOW	-	63	-	0.98	-	LOW
CHES	I-664	PUGHSVILLE RD	SUFFOLK CL	SB	42,898	83,511	2012	64	-	0.99	-	LOW	-	58	-	1.11	-	LOW	-
				NB	40,613		2008	-	63	-	1.00	-	LOW	-	64	-	0.99	-	LOW
CHES	ROUTE 13/58/460	SUFFOLK CL	I-664	EB	35,095	70,160	2012	61	-	1.01	-	LOW	-	62	-	1.00	-	LOW	-
				WB	35,065		2012	-	63	-	1.00	-	LOW	-	63	-	0.99	-	LOW
HAM	I-64	NEWPORT NEWS CL	HRC PARKWAY	EB	83,629	165,780	2010	65	-	0.99	-	LOW	-	65	-	0.99	-	LOW	-
				WB	82,151		2010	-	64	-	0.98	-	LOW	-	62	-	1.01	-	LOW
HAM	I-64	HRC PARKWAY	MAGRUDER BLVD	EB	74,462	147,276	2010	66	-	0.98	-	LOW	-	66	-	0.98	-	LOW	-
				WB	72,814		2010	-	65	-	0.97	-	LOW	-	62	-	1.02	-	LOW
HAM	I-64	MAGRUDER BLVD	MERCURY BLVD	EB	79,577	150,996	2011	65	-	0.97	-	LOW	-	65	-	0.97	-	LOW	-
				WB	71,419		2011	-	65	-	0.97	-	LOW	-	64	-	0.98	-	LOW
HAM	I-64	MERCURY BLVD	I-664	EB	72,648	145,179	2012	64	-	0.98	-	LOW	-	64	-	0.98	-	LOW	-
				WB	72,531		2012	-	64	-	0.97	-	LOW	-	63	-	0.99	-	LOW
HAM	I-64	I-664	ARMISTEAD AVE	EB	63,185	125,154	2010	61	-	1.02	-	LOW	-	61	-	1.02	-	LOW	-
				WB	61,969		2010	-	65	-	0.99	-	LOW	-	64	-	0.99	-	LOW
HAM	I-64	ARMISTEAD AVE	RIP RAP RD	EB	56,684	104,324	2011	58	-	1.08	-	LOW	-	58	-	1.08	-	LOW	-
				WB	47,640		2011	-	64	-	0.98	-	LOW	-	63	-	0.98	-	LOW
HAM	I-64	RIP RAP RD	SETTLERS LANDING RD	EB	56,684	104,324	2011	33	-	2.00	-	SEV	-	38	-	1.86	-	SEV	-
				WB	47,640		2011	-	64	-	0.98	-	LOW	-	63	-	0.98	-	LOW
HAM	I-64	SETTLERS LANDING RD	MALLORY ST	EB	47,404	96,501	2010	26	-	2.39	-	SEV	-	28	-	2.39	-	SEV	-
				WB	49,097		2010	-	63	-	0.97	-	LOW	-	63	-	0.98	-	LOW
HAM	I-64/HRBT	MALLORY ST	NORFOLK CL	EB	46,088	90,397	2012	51	-	1.14	-	LOW	-	48	-	1.20	-	MOD	-
				WB	44,309		2012	-	57	-	1.03	-	LOW	-	46	-	1.38	-	SEV

*Weekday traffic volumes have been updated from the HRTPO Congestion Management Process (CMP) database through August 2013.

Appendix A: Traffic Volumes, Speeds, and Congestion (National Freight Network – Hampton Roads Base Network)

JURIS NAME	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	WEEKDAY TRAFFIC VOLUMES*			2012 SPEED AND CONGESTION DATA											
								AM PEAK HOUR						PM PEAK HOUR					
								SPEED (mph)		TRAVEL TIME INDEX		CONGESTION LEVEL		SPEED (mph)		TRAVEL TIME INDEX		CONGESTION LEVEL	
					ONE-WAY EXISTING	TWO-WAY EXISTING	COUNT YEAR	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
HAM	I-664	NEWPORT NEWS CL	ABERDEEN RD	SB	38,504	76,586	2010	62	-	0.98	-	LOW	-	63	-	0.98	-	LOW	-
				NB	38,082		2010	-	63	-	0.98	-	LOW	-	63	-	0.98	-	LOW
HAM	I-664	ABERDEEN RD	POWER PLANT PKWY	SB	36,890	73,469	2012	63	-	0.98	-	LOW	-	64	-	0.97	-	LOW	-
				NB	36,579		2012	-	64	-	0.97	-	LOW	-	63	-	0.99	-	LOW
HAM	I-664	POWER PLANT PKWY	I-64	SB	42,715	84,512	2010	63	-	0.97	-	LOW	-	62	-	0.98	-	LOW	-
				NB	41,797		2010	-	62	-	0.98	-	LOW	-	60	-	1.02	-	LOW
IW	ROUTE 460	SOUTHAMPTON CL	FIRETOWER RD (RTE 644)			9,861	2011	55	56	1.01	1.02	LOW	LOW	55	57	1.02	1.02	LOW	LOW
IW	ROUTE 460	FIRETOWER RD (RTE 644)	WCL WINDSOR			9,861	2011	55	56	1.01	1.02	LOW	LOW	55	57	1.02	1.02	LOW	LOW
IW/WIND	ROUTE 460	WCL WINDSOR	ROUTE 258			9,861	2011	55	56	1.01	1.02	LOW	LOW	55	57	1.02	1.02	LOW	LOW
IW/WIND	ROUTE 460	ROUTE 258	COURT ST (RTE 610)			14,054	2011	31	33	1.15	1.08	LOW	LOW	30	32	1.16	1.13	LOW	LOW
IW	ROUTE 460	COURT ST (RTE 610)	ECL WINDSOR			15,315	2011	52	51	1.01	1.02	LOW	LOW	52	50	1.01	1.04	LOW	LOW
IW	ROUTE 460	ECL WINDSOR	SUFFOLK CL			15,315	2011	52	51	1.01	1.02	LOW	LOW	52	50	1.01	1.04	LOW	LOW
JCC	I-64	NEW KENT CL	RTE 30	EB	23,202	45,758	2012	69	-	0.95	-	LOW	-	70	-	0.93	-	LOW	-
				WB	22,556		2012	-	68	-	0.96	-	LOW	-	70	-	0.93	-	LOW
JCC	I-64	RTE 30	CROAKER RD (RTE 607)	EB	26,387	52,061	2012	69	-	0.95	-	LOW	-	69	-	0.94	-	LOW	-
				WB	25,674		2012	-	68	-	0.96	-	LOW	-	70	-	0.94	-	LOW
JCC	I-64	CROAKER RD (RTE 607)	YORK CL	EB	29,765	58,461	2012	68	-	0.95	-	LOW	-	69	-	0.94	-	LOW	-
				WB	28,696		2012	-	67	-	0.96	-	LOW	-	69	-	0.95	-	LOW
JCC	I-64	YORK CL	NEWPORT NEWS CL	EB	42,495	87,885	2010	66	-	0.99	-	LOW	-	60	-	1.13	-	LOW	-
				WB	45,390		2010	-	67	-	0.97	-	LOW	-	66	-	1.00	-	LOW
NN	I-64	JAMES CITY CL	RTE 143 (NORTH)	EB	42,495	87,885	2010	66	-	0.99	-	LOW	-	60	-	1.13	-	LOW	-
				WB	45,390		2010	-	67	-	0.97	-	LOW	-	66	-	1.00	-	LOW
NN	I-64	RTE 143 (NORTH)	YORKTOWN RD	EB	43,637	87,312	2010	64	-	1.02	-	LOW	-	55	-	1.25	-	MOD	-
				WB	43,675		2010	-	67	-	0.97	-	LOW	-	66	-	0.98	-	LOW
NN	I-64	YORKTOWN RD	FORT EUSTIS BLVD	EB	46,996	94,337	2010	62	-	1.05	-	LOW	-	49	-	1.47	-	SEV	-
				WB	47,341		2010	-	67	-	0.98	-	LOW	-	66	-	0.99	-	LOW
NN	I-64	FORT EUSTIS BLVD	JEFFERSON AVE	EB	52,479	103,475	2010	65	-	0.99	-	LOW	-	60	-	1.09	-	LOW	-
				WB	50,996		2010	-	64	-	1.01	-	LOW	-	58	-	1.11	-	LOW
NN	I-64	JEFFERSON AVE	OYSTER POINT RD	EB	63,384	127,241	2010	66	-	0.98	-	LOW	-	65	-	0.98	-	LOW	-
				WB	63,857		2010	-	65	-	0.97	-	LOW	-	61	-	1.06	-	LOW
NN	I-64	OYSTER POINT RD	J C MORRIS BLVD	EB	67,299	133,166	2012	65	-	0.98	-	LOW	-	65	-	0.98	-	LOW	-
				WB	65,867		2012	-	65	-	0.98	-	LOW	-	65	-	0.98	-	LOW
NN	I-64	J C MORRIS BLVD	HAMPTON CL	EB	83,629	165,780	2010	65	-	0.99	-	LOW	-	65	-	0.99	-	LOW	-
				WB	82,151		2010	-	64	-	0.98	-	LOW	-	62	-	1.01	-	LOW
NN	I-664/MMMBT	SUFFOLK CL	TERMINAL AVE	SB	30,987	63,088	2012	63	-	0.98	-	LOW	-	57	-	1.07	-	LOW	-
				NB	32,101		2012	-	61	-	0.98	-	LOW	-	62	-	0.97	-	LOW
NN	I-664	TERMINAL AVE	23RD ST	SB	27,054	63,188	2010	59	-	1.01	-	LOW	-	23	-	2.76	-	SEV	-
				NB	36,134		2010	-	63	-	0.99	-	LOW	-	63	-	0.99	-	LOW
NN	I-664	23RD ST	CHESTNUT AVE	SB	35,508	69,586	2010	62	-	0.99	-	LOW	-	47	-	1.44	-	SEV	-
				NB	34,078		2010	-	64	-	0.98	-	LOW	-	63	-	0.98	-	LOW
NN	I-664	CHESTNUT AVE	HAMPTON CL	SB	38,504	76,586	2010	62	-	0.98	-	LOW	-	63	-	0.98	-	LOW	-
				NB	38,082		2010	-	63	-	0.98	-	LOW	-	63	-	0.98	-	LOW
NOR	I-64/HRBT	HAMPTON CL	OCEAN VIEW AVE	EB	46,088	90,397	2012	51	-	1.14	-	LOW	-	48	-	1.20	-	MOD	-
				WB	44,309		2012	-	57	-	1.03	-	LOW	-	46	-	1.38	-	SEV
NOR	I-64	OCEAN VIEW AVE	4TH VIEW AVE	EB	46,088	90,397	2012	62	-	0.97	-	LOW	-	58	-	1.05	-	LOW	-
				WB	44,309		2012	-	58	-	1.04	-	LOW	-	30	-	2.14	-	SEV
NOR	I-64	4TH VIEW AVE	BAY AVE	EB	46,608	88,590	2012	62	-	0.98	-	LOW	-	50	-	1.26	-	MOD	-
				WB	41,982		2012	-	61	-	1.02	-	LOW	-	23	-	3.12	-	SEV
NOR	I-64	BAY AVE	GRANBY ST	EB	52,964	99,901	2012	62	-	0.98	-	LOW	-	52	-	1.17	-	MOD	-
				WB	46,937		2012	-	62	-	0.99	-	LOW	-	36	-	2.01	-	SEV
NOR	I-64	GRANBY ST	I-564/LITTLE CREEK RD	EB	52,964	99,901	2012	62	-	0.98	-	LOW	-	52	-	1.17	-	MOD	-
				WB	46,937		2012	-	62	-	0.99	-	LOW	-	36	-	2.01	-	SEV

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JURIS NAME	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	WEEKDAY TRAFFIC VOLUMES*			2012 SPEED AND CONGESTION DATA											
								AM PEAK HOUR						PM PEAK HOUR					
								SPEED (mph)		TRAVEL TIME INDEX		CONGESTION LEVEL		SPEED (mph)		TRAVEL TIME INDEX		CONGESTION LEVEL	
					ONE-WAY EXISTING	TWO-WAY EXISTING	COUNT YEAR	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
NOR	I-64	I-564/LITTLE CREEK RD	TIDEWATER DR	REV	24,847		2010	-	64	-	1.01	-	LOW	61	-	1.05	-	LOW	-
				EB	53,199	134,943	2012	63	-	0.99	-	LOW	-	42	-	1.53	-	SEV	-
				WB	56,897		2012	-	61	-	1.01	-	LOW	-	53	-	1.24	-	MOD
NOR	I-64	TIDEWATER DR	CHESAPEAKE BLVD	REV	24,847		2010	-	65	-	0.99	-	LOW	60	-	1.08	-	LOW	-
				EB	58,772	144,645	2012	61	-	1.01	-	LOW	-	36	-	1.72	-	SEV	-
				WB	61,026		2012	-	58	-	1.08	-	LOW	-	62	-	0.99	-	LOW
NOR	I-64	CHESAPEAKE BLVD	NORVIEW AVE	REV	24,847		2010	-	65	-	1.00	-	LOW	60	-	1.08	-	LOW	-
				EB	68,784	162,899	2006	59	-	1.04	-	LOW	-	36	-	1.75	-	SEV	-
				WB	69,268		2012	-	59	-	1.04	-	LOW	-	62	-	0.98	-	LOW
NOR	I-64	NORVIEW AVE	MILITARY HWY	REV	24,847		2010	-	66	-	0.98	-	LOW	62	-	1.05	-	LOW	-
				EB	71,105	168,157	2012	60	-	1.02	-	LOW	-	44	-	1.39	-	SEV	-
				WB	72,205		2012	-	58	-	1.05	-	LOW	-	62	-	0.99	-	LOW
NOR	I-64	MILITARY HWY	NORTHAMPTON BLVD	REV	24,847		2010	-	66	-	0.98	-	LOW	62	-	1.04	-	LOW	-
				EB	60,374	156,977	2012	61	-	1.00	-	LOW	-	42	-	1.51	-	SEV	-
				WB	71,756		2012	-	57	-	1.07	-	LOW	-	62	-	0.99	-	LOW
NOR	I-64	NORTHAMPTON BLVD	I-264	REV	18,177		2006	-	64	-	1.02	-	LOW	62	-	1.06	-	LOW	-
				EB	75,649	181,528	2012	55	-	1.08	-	LOW	-	41	-	1.46	-	SEV	-
				WB	87,702		2012	-	56	-	1.10	-	LOW	-	58	-	1.06	-	LOW
NOR	I-64	I-264	VA BEACH CL	EB	74,977	148,090	2012	61	-	0.98	-	LOW	-	49	-	1.23	-	MOD	-
				WB	73,113		2012	-	49	-	1.27	-	MOD	-	50	-	1.24	-	MOD
NOR	I-264/DOWNTOWN TUNNEL	PORTSMOUTH CL	I-464	EB	46,851	96,785	2012	27	-	1.70	-	SEV	-	33	-	1.42	-	SEV	-
				WB	49,934		2012	-	38	-	1.30	-	SEV	-	37	-	1.35	-	SEV
NOR	I-264/BERKLEY BRIDGE	I-464	WATERSIDE/CITY HALL/TIDEWATER	EB	64,418	111,344	2011	40	-	1.17	-	MOD	-	45	-	1.04	-	LOW	-
				WB	46,926		2011	-	24	-	1.97	-	SEV	-	12	-	3.94	-	SEV
NOR	I-264	WATERSIDE/CITY HALL/TIDEWATER	BRAMBLETON AVE	EB	53,382	102,134	2012	55	-	1.03	-	LOW	-	54	-	1.05	-	LOW	-
				WB	48,752		2012	-	41	-	1.36	-	SEV	-	16	-	3.46	-	SEV
NOR	I-264	BRAMBLETON AVE	BALLENTINE BLVD	EB	66,539	131,527	2012	61	-	1.00	-	LOW	-	59	-	1.05	-	LOW	-
				WB	64,988		2012	-	56	-	1.07	-	LOW	-	37	-	1.68	-	SEV
NOR	I-264	BALLENTINE BLVD	MILITARY HWY	EB	64,320	129,255	2012	61	-	1.01	-	LOW	-	58	-	1.06	-	LOW	-
				WB	64,935		2012	-	61	-	1.00	-	LOW	-	61	-	1.00	-	LOW
NOR	I-264	MILITARY HWY	I-64	EB	63,550	121,436	2012	61	-	1.01	-	LOW	-	53	-	1.17	-	MOD	-
				WB	57,886		2012	-	64	-	0.98	-	LOW	-	62	-	1.00	-	LOW
NOR	I-264	I-64	NEWTOWN RD/WCL VA. BEACH	EB	125,000	254,872	2006	63	-	1.01	-	LOW	-	46	-	1.39	-	SEV	-
				WB	129,872		2006	-	62	-	1.01	-	LOW	-	55	-	1.13	-	LOW
NOR	I-464	CHESAPEAKE CL	SOUTH MAIN ST	NB	27,877	51,569	2012	48	-	1.30	-	SEV	-	58	-	1.07	-	LOW	-
				SB	23,692		2012	-	59	-	1.05	-	LOW	-	61	-	1.01	-	LOW
NOR	I-464	SOUTH MAIN ST	I-264	NB	26,036	47,355	2009	36	-	1.63	-	SEV	-	51	-	1.13	-	LOW	-
				SB	21,319		2009	-	48	-	1.21	-	MOD	-	54	-	1.06	-	LOW
NOR	I-564	ADMIRAL TAUSSIG BLVD	FUTURE INTERMODAL CONNECTOR	NB	20,363	42,902	2012	34	-	1.71	-	SEV	-	50	-	1.16	-	MOD	-
				SB	22,539		2012	-	49	-	1.17	-	MOD	-	48	-	1.20	-	MOD
NOR	I-564	FUTURE INTERMODAL CONNECTOR	INTERNATIONAL TERMINAL BLVD	NB	20,363	42,902	2012	34	-	1.71	-	SEV	-	50	-	1.16	-	MOD	-
				SB	22,539		2012	-	49	-	1.17	-	MOD	-	48	-	1.20	-	MOD
NOR	I-564	INTERNATIONAL TERMINAL BLVD	I-64	NB	38,879	67,502	2012	46	-	1.34	-	SEV	-	50	-	1.23	-	MOD	-
				SB	28,623		2009	-	50	-	1.20	-	MOD	-	40	-	1.50	-	SEV
PORT	I-264	WCL PORTSMOUTH	GREENWOOD DR	EB	27,749	56,970	2012	61	-	0.99	-	LOW	-	61	-	1.00	-	LOW	-
				WB	29,221		2009	-	61	-	0.99	-	LOW	-	60	-	1.00	-	LOW
PORT	I-264	GREENWOOD DR	VICTORY BLVD	EB	27,055	54,718	2012	62	-	0.99	-	LOW	-	62	-	0.99	-	LOW	-
				WB	27,663		2012	-	62	-	1.00	-	LOW	-	61	-	1.01	-	LOW
PORT	I-264	VICTORY BLVD	PORTSMOUTH BLVD	EB	32,211	63,935	2012	61	-	1.01	-	LOW	-	62	-	0.99	-	LOW	-
				WB	31,724		2012	-	62	-	1.01	-	LOW	-	62	-	1.00	-	LOW
PORT	I-264	PORTSMOUTH BLVD	FREDERICK BLVD	EB	32,513	65,684	2012	51	-	1.25	-	MOD	-	61	-	1.01	-	LOW	-
				WB	33,171		2012	-	61	-	1.01	-	LOW	-	61	-	1.00	-	LOW

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JURIS NAME	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	WEEKDAY TRAFFIC VOLUMES*			2012 SPEED AND CONGESTION DATA									
								AM PEAK HOUR						PM PEAK HOUR					
								SPEED (mph)		TRAVEL TIME INDEX		CONGESTION LEVEL		SPEED (mph)		TRAVEL TIME INDEX		CONGESTION LEVEL	
					ONE-WAY EXISTING	TWO-WAY EXISTING	COUNT YEAR	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
PORT	I-264	FREDERICK BLVD	FUTURE MLK FWY	EB	40,279	79,058	2012	29	-	2.29	-	SEV	-	48	-	1.29	-	MOD	-
				WB	38,779		2012	-	62	-	0.97	-	LOW	-	62	-	0.97	-	LOW
PORT	I-264	FUTURE MLK FWY	DES MOINES AVE	EB	40,279	79,058	2012	29	-	2.29	-	SEV	-	48	-	1.29	-	MOD	-
				WB	38,779		2012	-	62	-	0.97	-	LOW	-	62	-	0.97	-	LOW
PORT	I-264	DES MOINES AVE	EFFINGHAM ST	EB	37,254	72,965	2012	15	-	3.57	-	SEV	-	17	-	3.25	-	SEV	-
				WB	35,711		2012	-	60	-	1.00	-	LOW	-	60	-	1.00	-	LOW
PORT	I-264/DOWNTOWN TUNNEL	EFFINGHAM ST	NORFOLK CL	EB	46,851	96,785	2012	27	-	1.70	-	SEV	-	33	-	1.42	-	SEV	-
				WB	49,934		2012	-	38	-	1.30	-	SEV	-	37	-	1.35	-	SEV
PORT	M L K FREEWAY	HIGH ST	LONDON BLVD	NB	5,951	12,796	2010	-	-	-	-	LOW		-	-	-	-	LOW	
				SB	6,844		2010	-	-	-	-	LOW		-	-	-	-	LOW	
PORT	M L K FREEWAY	LONDON BLVD	WESTERN FREEWAY/MIDTOWN TUNNEL	NB	18,723	36,989	2012	30	-	1.82	-	SEV	-	39	-	1.30	-	SEV	-
				SB	18,266		2012	-	48	-	1.07	-	LOW	-	48	-	1.06	-	LOW
PORT	WESTERN FWY	SUFFOLK CL	TOWNE POINT RD	EB	25,310	51,169	2012	62	-	1.01	-	LOW	-	62	-	1.00	-	LOW	-
				WB	25,859		2012	-	61	-	1.02	-	LOW	-	61	-	1.03	-	LOW
PORT	WESTERN FWY	TOWNE POINT RD	CEDAR LN	EB	27,173	54,639	2012	62	-	1.02	-	LOW	-	62	-	1.01	-	LOW	-
				WB	27,466		2012	-	62	-	1.02	-	LOW	-	61	-	1.02	-	LOW
PORT	WESTERN FWY	CEDAR LN	APM BLVD	EB	24,756	50,038	2009	49	-	1.32	-	SEV	-	60	-	1.02	-	LOW	-
				WB	25,282		2009	-	59	-	1.03	-	LOW	-	59	-	1.02	-	LOW
PORT	WESTERN FWY	APM BLVD	WEST NORFOLK RD	EB	22,965	47,056	2012	49	-	1.32	-	SEV	-	60	-	1.02	-	LOW	-
				WB	24,091		2012	-	59	-	1.03	-	LOW	-	59	-	1.02	-	LOW
PORT	WESTERN FWY	WEST NORFOLK RD	MLK FREEWAY/MIDTOWN TUNNEL	EB	26,754	53,861	2012	40	-	1.40	-	SEV	-	52	-	1.03	-	LOW	-
				WB	27,107		2012	-	54	-	1.02	-	LOW	-	54	-	1.02	-	LOW
SUF	I-664	CHESAPEAKE CL	BRIDGE RD	SB	42,898	83,511	2012	64	-	0.99	-	LOW	-	58	-	1.11	-	LOW	-
				NB	40,613		2008	-	63	-	1.00	-	LOW	-	64	-	0.99	-	LOW
SUF	I-664	BRIDGE RD	WESTERN FWY	SB	28,298	57,399	2008	64	-	0.99	-	LOW	-	58	-	1.11	-	LOW	-
				NB	29,101		2008	-	63	-	1.00	-	LOW	-	64	-	0.99	-	LOW
SUF	I-664	WESTERN FWY	COLLEGE DR	SB	30,645	63,302	2012	65	-	0.99	-	LOW	-	64	-	1.00	-	LOW	-
				NB	32,657		2010	-	64	-	0.99	-	LOW	-	64	-	0.99	-	LOW
SUF	I-664/MMMBT	COLLEGE DR	NEWPORT NEWS CL	SB	30,987	63,088	2012	63	-	0.98	-	LOW	-	57	-	1.07	-	LOW	-
				NB	32,101		2012	-	61	-	0.98	-	LOW	-	62	-	0.97	-	LOW
SUF	PRUDEN BLVD	ISLE OF WIGHT CL	LAKE PRINCE DR			14,998	2011	52	51	1.01	1.02	LOW	LOW	52	50	1.01	1.04	LOW	LOW
SUF	PRUDEN BLVD	LAKE PRINCE DR	KINGS FORK RD			18,251	2011	42	42	1.09	1.13	LOW	LOW	43	43	1.08	1.12	LOW	LOW
SUF	PRUDEN BLVD	KINGS FORK RD	SUFFOLK BYPASS			18,209	2011	39	40	1.07	1.15	LOW	LOW	40	40	1.04	1.14	LOW	LOW
SUF	ROUTE 13/58/460	SUFFOLK BYPASS	CHESAPEAKE CL	EB	35,095	70,160	2012	61	-	1.01	-	LOW	-	62	-	1.00	-	LOW	-
				WB	35,065		2012	-	63	-	1.00	-	LOW	-	63	-	0.99	-	LOW
SUF	ROUTE 58	SOUTHAMPTON CL	RTE 189/258			17,413	2011	64	63	0.99	1.00	LOW	LOW	63	64	1.00	0.99	LOW	LOW
SUF	ROUTE 58	RTE 189/258	RTE 272 (S. QUAY RD)			15,663	2011	63	63	0.98	0.99	LOW	LOW	63	64	0.98	0.99	LOW	LOW
SUF	ROUTE 58	RTE 272	S. QUAY RD (ROUTE 189)			18,626	2011	62	63	0.99	0.99	LOW	LOW	62	63	0.99	0.99	LOW	LOW
SUF	ROUTE 58 (HOLLAND BYPASS)	S. QUAY RD (ROUTE 189)	BUS RTE 58 (HOLLAND RD)			18,818	2011	61	61	0.98	1.00	LOW	LOW	61	62	0.98	0.99	LOW	LOW
SUF	ROUTE 58 (HOLLAND RD)	BUS RTE 58 (HOLLAND RD)	RTE 649 (LUMMIS RD)			22,120	2011	60	60	0.99	1.00	LOW	LOW	60	60	0.99	0.99	LOW	LOW
SUF	ROUTE 58 (HOLLAND RD)	RTE 649 (LUMMIS RD)	RTE 643 (MANNING BRIDGE RD)			23,276	2011	50	55	1.09	1.01	LOW	LOW	50	51	1.08	1.08	LOW	LOW
SUF	ROUTE 58 (HOLLAND RD)	RTE. 643 (MANNING BRIDGE RD)	COVE POINT DR			27,861	2011	50	55	1.09	1.01	LOW	LOW	50	51	1.08	1.08	LOW	LOW
SUF	ROUTE 58 (HOLLAND RD)	COVE POINT DR	SUFFOLK BYPASS			30,165	2011	40	39	1.10	1.19	LOW	LOW	39	36	1.13	1.28	LOW	MOD
SUF	SUFFOLK BYPASS	HOLLAND RD	PITCHKETTLE RD	EB	17,052	34,411	2011	62	-	1.00	-	LOW	-	62	-	1.00	-	LOW	-
				WB	17,359		2011	-	57	-	1.01	-	LOW	-	55	-	1.06	-	LOW
SUF	SUFFOLK BYPASS	PITCHKETTLE RD	PRUDEN BLVD	EB	18,186	36,139	2011	63	-	0.97	-	LOW	-	63	-	0.98	-	LOW	-
				WB	17,953		2011	-	63	-	1.00	-	LOW	-	64	-	0.98	-	LOW
SUF	SUFFOLK BYPASS	PRUDEN BLVD	GODWIN BLVD	EB	20,008	42,550	2012	63	-	0.98	-	LOW	-	62	-	0.98	-	LOW	-
				WB	22,542		2012	-	58	-	1.01	-	LOW	-	59	-	1.00	-	LOW
SUF	SUFFOLK BYPASS	GODWIN BLVD	WILROY RD	EB	26,357	53,633	2012	64	-	0.98	-	LOW	-	64	-	0.97	-	LOW	-
				WB	27,276		2012	-	63	-	0.98	-	LOW	-	63	-	0.99	-	LOW

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JURIS NAME	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	WEEKDAY TRAFFIC VOLUMES*			2012 SPEED AND CONGESTION DATA											
								AM PEAK HOUR						PM PEAK HOUR					
								SPEED (mph)		TRAVEL TIME INDEX		CONGESTION LEVEL		SPEED (mph)		TRAVEL TIME INDEX		CONGESTION LEVEL	
					ONE-WAY EXISTING	TWO-WAY EXISTING	COUNT YEAR	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
SUF	SUFFOLK BYPASS	WILROY RD	ROUTES 13/58/460	EB	23,121	45,487	2012	64	-	0.98	-	LOW	-	64	-	0.97	-	LOW	-
				WB	22,366		2012	-	64	-	0.98	-	LOW	-	64	-	0.97	-	LOW
SUF	WESTERN FWY	BRIDGE RD	I-664	EB	7,145	20,501	2008	57	-	1.01	-	LOW	-	58	-	1.00	-	LOW	-
				WB	13,356		2008	-	57	-	0.99	-	LOW	-	57	-	1.00	-	LOW
SUF	WESTERN FWY	I-664	COLLEGE DR	EB	19,983	40,440	2012	60	-	1.03	-	LOW	-	60	-	1.02	-	LOW	-
				WB	20,457		2012	-	57	-	0.99	-	LOW	-	57	-	1.00	-	LOW
SUF	WESTERN FWY	COLLEGE DR	PORTSMOUTH CL	EB	25,310	51,169	2012	62	-	1.01	-	LOW	-	62	-	1.00	-	LOW	-
				WB	25,859		2012	-	61	-	1.02	-	LOW	-	61	-	1.03	-	LOW
VB	I-64	NORFOLK CL	INDIAN RIVER RD	EB	74,977	148,090	2012	61	-	0.98	-	LOW	-	49	-	1.23	-	MOD	-
				WB	73,113		2012	-	49	-	1.27	-	MOD	-	50	-	1.24	-	MOD
VB	I-64	INDIAN RIVER RD	CITY LINE RD/CHESEAPEAKE CL	EB	69,141	134,585	2012	62	-	0.99	-	LOW	-	61	-	1.00	-	LOW	-
				WB	65,444		2012	-	57	-	1.08	-	LOW	-	61	-	1.01	-	LOW
VB	I-264	NEWTOWN RD/ECL NORFOLK	WITCHDUCK RD	EB	100,873	194,757	2012	61	-	1.01	-	LOW	-	44	-	1.44	-	SEV	-
				WB	93,884		2012	-	63	-	1.00	-	LOW	-	59	-	1.08	-	LOW
VB	I-264	WITCHDUCK RD	INDEPENDENCE BLVD	EB	98,972	199,581	2012	62	-	1.00	-	LOW	-	59	-	1.07	-	LOW	-
				WB	100,609		2012	-	59	-	1.06	-	LOW	-	59	-	1.06	-	LOW
VB	I-264	INDEPENDENCE BLVD	ROSEMONT RD	EB	76,570	155,217	2012	62	-	1.00	-	LOW	-	63	-	0.99	-	LOW	-
				WB	78,647		2012	-	58	-	1.09	-	LOW	-	62	-	1.00	-	LOW
VB	I-264	ROSEMONT RD	LYNNHAVEN PKWY	EB	65,194	135,889	2012	62	-	1.01	-	LOW	-	63	-	0.99	-	LOW	-
				WB	70,695		2012	-	61	-	1.03	-	LOW	-	63	-	0.99	-	LOW
VB	I-264	LYNNHAVEN PKWY	LONDON BRIDGE RD	EB	63,098	128,112	2012	61	-	1.03	-	LOW	-	63	-	0.99	-	LOW	-
				WB	65,014		2012	-	62	-	0.99	-	LOW	-	62	-	0.99	-	LOW
VB	I-264	LONDON BRIDGE RD	LASKIN RD	EB	51,349	116,363	2012	61	-	1.03	-	LOW	-	63	-	0.99	-	LOW	-
				WB	65,014		2012	-	62	-	0.99	-	LOW	-	62	-	0.99	-	LOW
VB	I-264	LASKIN RD	FIRST COLONIAL RD	EB	28,577	65,568	2012	61	-	1.03	-	LOW	-	63	-	0.99	-	LOW	-
				WB	36,991		2012	-	63	-	0.99	-	LOW	-	63	-	0.99	-	LOW
VB	I-264	FIRST COLONIAL RD	S.E. PARKWAY CORRIDOR	EB	26,986	54,479	2012	61	-	1.02	-	LOW	-	61	-	1.01	-	LOW	-
				WB	27,493		2012	-	61	-	1.00	-	LOW	-	61	-	1.01	-	LOW
VB	I-264	S.E. PARKWAY CORRIDOR	BIRDNECK RD	EB	26,986	54,479	2012	61	-	1.02	-	LOW	-	61	-	1.01	-	LOW	-
				WB	27,493		2012	-	61	-	1.00	-	LOW	-	61	-	1.01	-	LOW
VB	I-264	BIRDNECK RD	PARKS AVE	EB	12,695	24,658	2012	57	-	1.05	-	LOW	-	57	-	1.06	-	LOW	-
				WB	11,963		2012	-	53	-	0.99	-	LOW	-	52	-	1.01	-	LOW
YC	I-64	JAMES CITY CL	RTE 199/646	EB	29,765	58,461	2012	68	-	0.95	-	LOW	-	69	-	0.94	-	LOW	-
				WB	28,696		2012	-	67	-	0.96	-	LOW	-	69	-	0.95	-	LOW
YC	I-64	RTE 199/646	RTE 143	EB	28,337	56,366	2012	69	-	0.95	-	LOW	-	69	-	0.94	-	LOW	-
				WB	28,029		2012	-	67	-	0.97	-	LOW	-	68	-	0.95	-	LOW
YC	I-64	RTE 143	RTE 199 (EAST OF WILLIAMSBURG)	EB	32,648	65,349	2010	68	-	0.96	-	LOW	-	68	-	0.95	-	LOW	-
				WB	32,701		2010	-	67	-	0.97	-	LOW	-	69	-	0.95	-	LOW
YC	I-64	RTE 199 (EAST OF WILLIAMSBURG)	GROVE CONNECTOR	EB	42,140	83,621	2010	67	-	0.97	-	LOW	-	66	-	0.98	-	LOW	-
				WB	41,481		2010	-	65	-	0.98	-	LOW	-	66	-	0.97	-	LOW
YC	I-64	GROVE CONNECTOR	JAMES CITY CL	EB	42,495	87,885	2010	66	-	0.99	-	LOW	-	60	-	1.13	-	LOW	-
				WB	45,390		2010	-	67	-	0.97	-	LOW	-	66	-	1.00	-	LOW

*Weekday traffic volumes have been updated from the HRTPO Congestion Management Process (CMP) database through August 2013.

APPENDIX B:
TRUCK VOLUMES, TOTAL WEEKDAY TRUCK DELAY, TRUCK DELAY PER MILE – 2010 EXISTING AND 20-YEAR FORECAST
(NATIONAL FREIGHT NETWORK – HAMPTON ROADS BASE NETWORK)

The following table shows the results from the recently published Existing and Future Truck Delay in Hampton Roads[41].

[41] *Existing and Future Truck Delay in Hampton Roads*, HRTPO, September 2013.

Appendix B: Truck Volumes, Total Weekday Truck Delay, Truck Delay Per Mile – 2010 Existing and 20-Year Forecast (National Freight Network – Hampton Roads Base Network)

Juris	Facility Name	Segment From	Segment To	Dir	CMP Segment Length (mi)	2010 Existing Weekday Truck Volume	20-Year Forecast Weekday Truck Volume	Change in Weekday Truck Volume	2010 Existing TOTAL Weekday Truck Delay (hours)	20-Year Forecast TOTAL Weekday Truck Delay (hours)	2010 Existing Truck Delay per Mile (hrs/mi)	20-Year Forecast Truck Delay per Mile (hrs/mi)
JCC	I-64	NEW KENT CL	RTE 30	EW	2.69	5,165	7,932	2,767	0.4	41.0	0.1	15.2
JCC	I-64	RTE 30	CROAKER RD (RTE 607)	EW	4.34	5,871	8,885	3,014	1.0	160.4	0.2	**37.0**
JCC	I-64	CROAKER RD (RTE 607)	YORK CL	EW	1.67	6,607	9,804	3,197	1.2	194.5	0.7	**116.5**
YC	I-64	JAMES CITY CL	RTE 199/646	EW	1.12	6,607	9,804	3,197	0.8	169.0	0.7	**150.9**
YC	I-64	RTE 199/646	RTE 143	EW	4.29	5,965	9,020	3,055	3.5	347.7	0.8	**81.1**
YC	I-64	RTE 143	RTE 199 (EAST OF WILLIAMSBURG)	EW	3.88	7,450	10,557	3,107	6.3	218.8	1.6	**56.4**
YC	I-64	RTE 199 (EAST OF WILLIAMSBURG)	GROVE CONNECTOR	EW	1.14	4,390	7,945	3,555	1.8	120.9	1.6	**106.1**
YC	I-64	GROVE CONNECTOR	JAMES CITY CL	EW	0.85	4,613	7,555	2,942	1.7	103.9	2.0	**122.2**
JCC	I-64	YORK CL	NEWPORT NEWS CL	EW	2.38	4,613	7,555	2,942	4.7	290.9	2.0	**122.2**
NN	I-64	JAMES CITY CL	RTE 143 (NORTH)	EW	0.27	4,613	7,211	2,598	0.5	21.5	2.0	**79.5**
NN	I-64	RTE 143 (NORTH)	YORKTOWN RD	EW	0.88	4,584	7,043	2,459	3.6	47.2	4.1	**53.6**
NN	I-64	YORKTOWN RD	FORT EUSTIS BLVD	EW	2.45	4,953	7,468	2,515	13.9	225.5	5.7	**92.0**
NN	I-64	FORT EUSTIS BLVD	JEFFERSON AVE	EW	4.86	5,433	7,743	2,310	18.7	697.7	3.8	**143.6**
NN	I-64	JEFFERSON AVE	OYSTER POINT RD	EW	1.60	6,680	9,217	2,537	10.1	20.1	6.3	12.6
NN	I-64	OYSTER POINT RD	J C MORRIS BLVD	EW	1.64	7,037	9,627	2,590	5.7	35.7	3.5	21.8
NN	I-64	J C MORRIS BLVD	HAMPTON CL	EW	0.90	8,704	10,469	1,765	4.7	30.7	5.3	**34.1**
HAM	I-64	NEWPORT NEWS CL	HRC PARKWAY	EW	2.24	8,704	10,469	1,765	11.8	72.1	5.3	**32.2**
HAM	I-64	HRC PARKWAY	MAGRUDER BLVD	EW	0.77	7,733	9,483	1,750	5.0	18.0	6.5	23.4
HAM	I-64	MAGRUDER BLVD	MERCURY BLVD	EW	1.04	7,931	9,801	1,870	4.7	30.5	4.5	29.3
HAM	I-64	MERCURY BLVD	I-664	EW	0.96	7,776	9,509	1,733	4.7	40.1	4.9	**41.8**
HAM	I-64	I-664	ARMISTEAD AVE	EW	0.88	4,571	5,181	610	2.6	9.4	3.0	10.6
HAM	I-64	ARMISTEAD AVE	RIP RAP RD	EW	0.46	3,830	4,246	416	2.0	7.8	4.4	16.9
HAM	I-64	RIP RAP RD	SETTLERS LANDING RD	EW	1.55	3,830	4,264	434	22.9	21.1	14.8	13.6
HAM	I-64	SETTLERS LANDING RD	MALLORY ST	EW	0.54	3,518	3,914	396	10.4	28.1	19.2	**52.1**
HAM	I-64/HRBT	MALLORY ST	NORFOLK CL	EW	3.69	3,276	3,668	392	36.2	319.7	9.8	**86.6**
NOR	I-64/HRBT	HAMPTON CL	OCEAN VIEW AVE	EW	0.19	3,276	3,668	392	1.9	16.5	9.8	**86.6**
NOR	I-64	OCEAN VIEW AVE	4TH VIEW AVE	EW	1.82	3,279	3,549	270	17.8	80.4	9.8	**44.2**
NOR	I-64	4TH VIEW AVE	BAY AVE	EW	1.01	3,078	3,110	32	17.3	17.2	17.2	17.0
NOR	I-64	BAY AVE	GRANBY ST	EW	1.60	3,435	3,430	(5)	21.2	45.4	13.2	28.4
NOR	I-64	GRANBY ST	I-564/LITTLE CREEK RD	EW	0.21	3,435	3,553	118	2.3	1.2	10.9	5.6
NOR	I-64	I-564/LITTLE CREEK RD	TIDEWATER DR	EW	1.17	3,859	3,890	31	10.7	4.9	9.2	4.1
NOR	I-64	TIDEWATER DR	CHESAPEAKE BLVD	EW	1.04	4,122	4,056	(66)	8.4	8.8	8.1	8.4
NOR	I-64	CHESAPEAKE BLVD	NORVIEW AVE	EW	0.97	4,382	4,300	(82)	8.1	10.3	8.3	10.6
NOR	I-64	NORVIEW AVE	MILITARY HWY	EW	1.22	4,828	4,772	(56)	7.1	23.9	5.8	19.6
NOR	I-64	MILITARY HWY	NORTHAMPTON BLVD	EW	1.07	3,938	3,817	(121)	6.3	10.3	5.9	9.7
NOR	I-64	NORTHAMPTON BLVD	I-264	EW	2.12	5,437	5,323	(114)	21.2	16.8	10.0	7.9
NOR	I-64	I-264	VA BEACH CL	EW	0.93	4,955	5,739	784	8.3	13.3	8.9	14.3

Appendix B: Truck Volumes, Total Weekday Truck Delay, Truck Delay Per Mile – 2010 Existing and 20-Year Forecast (National Freight Network – Hampton Roads Base Network)

Juris	Facility Name	Segment From	Segment To	Dir	CMP Segment Length (mi)	2010 Existing Weekday Truck Volume	20-Year Forecast Weekday Truck Volume	Change in Weekday Truck Volume	2010 Existing TOTAL Weekday Truck Delay (hours)	20-Year Forecast TOTAL Weekday Truck Delay (hours)	2010 Existing Truck Delay per Mile (hrs/mi)	20-Year Forecast Truck Delay per Mile (hrs/mi)
VB	I-64	NORFOLK CL	INDIAN RIVER RD	EW	1.57	4,955	5,740	785	14.0	22.1	8.9	14.1
VB	I-64	INDIAN RIVER RD	CHESEAPEAKE CL	EW	1.36	4,360	5,317	957	3.6	14.8	2.6	10.9
CHES	I-64	VA BEACH CL	GREENBRIER PKWY	EW	1.30	4,360	5,317	957	3.4	15.3	2.6	11.8
CHES	I-64	GREENBRIER PKWY	BATTLEFIELD BLVD	EW	1.42	4,226	5,297	1,071	9.4	5.9	6.6	4.2
CHES	I-64	BATTLEFIELD BLVD	I-464	EW	1.08	6,374	7,390	1,016	29.4	9.2	27.2	8.5
CHES	I-64	I-464	GEORGE WASHINGTON HWY	EW	4.38	7,835	9,328	1,493	39.3	563.8	9.0	128.7
CHES	I-64	GEORGE WASHINGTON HWY	MILITARY HWY	EW	1.53	7,220	8,710	1,490	34.1	99.2	22.3	64.8
CHES	I-64	MILITARY HWY	I-264&664	EW	2.31	6,989	7,935	946	29.7	45.2	12.9	19.5
CHES	I-264	I-64&664	WCL PORTSMOUTH	EW	1.23	2,616	2,003	(613)	1.5	9.8	1.2	8.0
PORT	I-264	WCL PORTSMOUTH	GREENWOOD DR	EW	0.42	2,616	1,996	(620)	0.5	3.6	1.2	8.6
PORT	I-264	GREENWOOD DR	VICTORY BLVD	EW	1.31	2,564	1,267	(1,297)	1.9	1.8	1.4	1.4
PORT	I-264	VICTORY BLVD	PORTSMOUTH BLVD	EW	0.75	2,876	1,238	(1,638)	1.6	0.9	2.1	1.3
PORT	I-264	PORTSMOUTH BLVD	FREDERICK BLVD	EW	0.91	3,075	1,338	(1,737)	4.6	0.8	5.1	0.9
PORT	I-264	FREDERICK BLVD	FUTURE MLK FWY	EW	0.45	3,624	1,653	(1,971)	10.1	0.6	22.5	1.4
PORT	I-264	FUTURE MLK FWY	DES MOINES AVE	EW	0.51	3,624	1,946	(1,678)	11.5	1.1	22.5	2.1
PORT	I-264	DES MOINES AVE	EFFINGHAM ST	EW	0.72	3,360	2,079	(1,281)	26.0	1.7	36.2	2.4
PORT	I-264/DOWNTOWN TUNNEL	EFFINGHAM ST	NORFOLK CL	EW	0.72	4,420	2,391	(2,029)	51.3	36.4	71.2	50.5
NOR	I-264/DOWNTOWN TUNNEL	PORTSMOUTH CL	I-464	EW	0.40	4,420	2,391	(2,029)	28.5	20.2	71.2	50.5
NOR	I-264/BERKLEY BRIDGE	I-464	WATERSIDE/CITY HALL/TIDEWATER	EW	0.72	3,194	2,594	(600)	31.9	13.3	44.4	18.5
NOR	I-264	WATERSIDE/CITY HALL/TIDEWATER	BRAMBLETON AVE	EW	0.91	3,137	2,502	(635)	31.5	3.5	34.6	3.8
NOR	I-264	BRAMBLETON AVE	BALLENTINE BLVD	EW	0.85	3,920	3,289	(631)	9.4	6.0	11.1	7.1
NOR	I-264	BALLENTINE BLVD	MILITARY HWY	EW	2.43	4,042	3,476	(566)	12.2	14.6	5.0	6.0
NOR	I-264	MILITARY HWY	I-64	EW	0.78	4,000	3,485	(515)	3.7	2.8	4.7	3.5
NOR	I-264	I-64	NEWTOWN RD/WCL VA. BEACH	EW	0.74	6,218	6,009	(209)	7.1	10.6	9.7	14.3
VB	I-264	NEWTOWN RD/ECL NORFOLK	WITCHDUCK RD	EW	1.47	5,204	5,024	(180)	11.6	42.8	7.9	29.1
VB	I-264	WITCHDUCK RD	INDEPENDENCE BLVD	EW	1.27	5,104	4,950	(154)	6.8	23.0	5.4	18.1
VB	I-264	INDEPENDENCE BLVD	ROSEMONT RD	EW	2.36	4,070	4,044	(26)	7.6	16.3	3.2	6.9
VB	I-264	ROSEMONT RD	LYNNHAVEN PKWY	EW	1.72	3,517	3,772	255	4.7	16.5	2.7	9.6
VB	I-264	LYNNHAVEN PKWY	LONDON BRIDGE RD	EW	0.65	3,073	3,841	768	1.6	5.0	2.5	7.7
VB	I-264	LONDON BRIDGE RD	LASKIN RD	EW	0.83	3,073	3,016	(57)	2.1	3.6	2.5	4.3
VB	I-264	LASKIN RD	FIRST COLONIAL RD	EW	1.19	1,608	1,593	(15)	1.2	1.6	1.0	1.3
VB	I-264	FIRST COLONIAL RD	S.E. PARKWAY LOCATION	EW	0.92	1,537	1,605	68	1.0	1.4	1.1	1.5
VB	I-264	S.E. PARKWAY LOCATION	BIRDNECK RD	EW	0.56	1,537	1,605	68	0.6	0.8	1.1	1.5
VB	I-264	BIRDNECK RD	PARKS AVE	EW	0.49	760	812	52	1.4	0.1	2.8	0.3
CHES	I-464	I-64	MILITARY HWY	NS	1.00	2,758	3,676	918	4.2	3.6	4.2	3.6
CHES	I-464	MILITARY HWY	FREEMAN AVE	NS	0.97	2,447	3,091	644	2.4	2.5	2.5	2.6
CHES	I-464	FREEMAN AVE	POINDEXTER ST	NS	1.90	2,410	3,035	625	5.8	5.8	3.0	3.1

Appendix B: Truck Volumes, Total Weekday Truck Delay, Truck Delay Per Mile – 2010 Existing and 20-Year Forecast (National Freight Network – Hampton Roads Base Network)

Juris	Facility Name	Segment From	Segment To	Dir	CMP Segment Length (mi)	2010 Existing Weekday Truck Volume	20-Year Forecast Weekday Truck Volume	Change in Weekday Truck Volume	2010 Existing TOTAL Weekday Truck Delay (hours)	20-Year Forecast TOTAL Weekday Truck Delay (hours)	2010 Existing Truck Delay per Mile (hrs/mi)	20-Year Forecast Truck Delay per Mile (hrs/mi)
CHES	I-464	POINDEXTER ST	NORFOLK CL	NS	0.72	2,432	3,097	665	3.5	7.8	4.9	10.8
NOR	I-464	CHESAPEAKE CL	SOUTH MAIN ST	NS	0.42	2,432	3,097	665	2.1	4.7	4.9	11.1
NOR	I-464	SOUTH MAIN ST	I-264	NS	0.61	2,294	2,998	704	5.1	5.4	8.4	8.9
NOR	I-564	ADMIRAL TAUSSIG BLVD	FUTURE INTERMODAL CONNECTOR	NS	0.50	987	497	(490)	3.0	0.1	6.0	0.1
NOR	I-564	FUTURE INTERMODAL CONNECTOR	INTERNATIONAL TERMINAL BLVD	NS	1.37	987	757	(230)	8.2	0.7	6.0	0.5
NOR	I-564	INTERNATIONAL TERMINAL BLVD	I-64	NS	0.90	1,637	1,399	(238)	5.4	0.4	6.0	0.4
CHES	I-664	I-64 & I-264	ROUTES 13/58/460	EW	1.70	8,277	7,937	(340)	11.0	15.7	6.5	9.2
CHES	I-664	ROUTES 13/58/460	DOCK LANDING RD	EW	1.25	6,550	8,050	1,500	6.4	97.6	5.2	78.1
CHES	I-664	DOCK LANDING RD	PORTSMOUTH BLVD	EW	1.14	6,474	7,955	1,481	5.5	55.6	4.8	48.8
CHES	I-664	PORTSMOUTH BLVD	PUGHSVILLE RD	EW	2.06	6,122	7,564	1,442	8.1	52.4	3.9	25.4
CHES	I-664	PUGHSVILLE RD	SUFFOLK CL	EW	0.83	5,471	7,071	1,600	4.2	8.0	5.0	9.6
SUF	I-664	CHESAPEAKE CL	BRIDGE RD	EW	0.74	5,471	7,071	1,600	3.7	38.3	5.0	51.7
SUF	I-664	BRIDGE RD	WESTERN FWY	EW	0.15	3,904	5,163	1,259	0.6	1.6	3.9	10.8
SUF	I-664	WESTERN FWY	COLLEGE DR	EW	1.41	4,318	5,097	779	4.8	6.9	3.4	4.9
SUF	I-664/MMMBT	COLLEGE DR	NEWPORT NEWS CL	EW	3.28	4,344	4,939	595	10.0	52.9	3.1	16.1
NN	I-664/MMMBT	SUFFOLK CL	TERMINAL AVE	EW	2.85	4,344	4,939	595	8.7	61.3	3.1	21.5
NN	I-664	TERMINAL AVE	23RD ST	EW	0.92	4,306	4,973	667	8.6	8.6	9.3	9.3
NN	I-664	23RD ST	CHESTNUT AVE	EW	1.69	4,730	5,795	1,065	7.8	10.2	4.6	6.1
NN	I-664	CHESTNUT AVE	HAMPTON CL	EW	0.24	5,207	6,591	1,384	0.8	2.2	3.3	9.4
HAM	I-664	NEWPORT NEWS CL	ABERDEEN RD	EW	0.44	5,207	6,591	1,384	1.4	4.1	3.3	9.4
HAM	I-664	ABERDEEN RD	POWER PLANT PKWY	EW	1.29	4,893	6,320	1,427	2.4	11.5	1.9	8.9
HAM	I-664	POWER PLANT PKWY	I-64	EW	1.38	5,746	7,116	1,370	7.0	10.9	5.1	7.9
CHES	ROUTE 13/58/460	SUFFOLK CL	I-664	EW	2.50	5,370	5,911	541	7.5	248.7	3.0	99.5
IW	ROUTE 460	SOUTHAMPTON CL	FIRETOWER RD (RTE 644)	EW	0.54	2,199	2,000	(199)	0.5	0.9	1.0	1.8
IW	ROUTE 460	FIRETOWER RD (RTE 644)	WCL WINDSOR	EW	5.56	2,199	2,000	(199)	5.4	12.1	1.0	2.2
IW/WIND	ROUTE 460	WCL WINDSOR	ROUTE 258	EW	0.08	2,199	2,000	(199)	0.1	0.2	1.0	2.0
IW/WIND	ROUTE 460	ROUTE 258	COURT ST (RTE 610)	EW	0.46	3,134	2,600	(534)	8.3	1.4	18.1	2.9
IW	ROUTE 460	COURT ST (RTE 610)	ECL WINDSOR	EW	0.75	3,415	2,600	(815)	1.8	3.9	2.4	5.3
IW	ROUTE 460	ECL WINDSOR	SUFFOLK CL	EW	2.35	3,415	2,600	(815)	5.6	12.4	2.4	5.3
IW	COMMONWEALTH CONNECTOR (RTE 460)	SOUTHAMPTON CL	ROUTE 258	EW	6.18	-	2,000	2,000	-	1.5	-	0.2
IW	COMMONWEALTH CONNECTOR (RTE 460)	ROUTE 258	SUFFOLK CL	EW	3.56	-	2,600	2,600	-	1.1	-	0.3
NOR	INTERMODAL CONNECTOR	SECOND ST	I-564	EW	1.50	-	286	286	-	0.1	-	0.0
PORT	MLK EXTENSION	I-264	HIGH ST	NS	0.57	-	1,072	1,072	-	1.3	-	2.3
PORT	M L K FREEWAY	HIGH ST	LONDON BLVD	NS	0.23	1,530	839	(691)	-	0.2	-	1.1

Appendix B: Truck Volumes, Total Weekday Truck Delay, Truck Delay Per Mile – 2010 Existing and 20-Year Forecast (National Freight Network – Hampton Roads Base Network)

Juris	Facility Name	Segment From	Segment To	Dir	CMP Segment Length (mi)	2010 Existing Weekday Truck Volume	20-Year Forecast Weekday Truck Volume	Change in Weekday Truck Volume	2010 Existing TOTAL Weekday Truck Delay (hours)	20-Year Forecast TOTAL Weekday Truck Delay (hours)	2010 Existing Truck Delay per Mile (hrs/mi)	20-Year Forecast Truck Delay per Mile (hrs/mi)
PORT	M L K FREEWAY	LONDON BLVD	WESTERN FREEWAY/MIDTOWN TUNNEL	NS	0.98	1,396	1,408	12	5.7	2.1	5.9	2.2
PORT	WESTERN FWY	SUFFOLK CL	TOWN POINT RD	EW	1.01	2,492	4,540	2,048	3.0	22.6	3.0	22.3
PORT	WESTERN FWY	TOWN POINT RD	CEDAR LN	EW	1.31	2,298	4,266	1,968	3.9	24.1	3.0	18.4
PORT	WESTERN FWY	CEDAR LN	APM BLVD	EW	1.00	2,019	3,949	1,930	4.1	17.7	4.1	17.7
PORT	WESTERN FWY	APM BLVD	WEST NORFOLK RD	EW	0.61	2,019	2,151	132	2.5	5.9	4.1	9.7
PORT	WESTERN FWY	WEST NORFOLK RD	MLK FREEWAY/MIDTOWN TUNNEL	EW	1.78	2,634	2,918	284	21.2	83.5	11.9	46.9
SUF	PRUDEN BLVD	ISLE OF WIGHT CL	LAKE PRINCE DR	EW	3.08	3,345	2,600	(745)	7.2	21.1	2.3	6.8
SUF	PRUDEN BLVD	LAKE PRINCE DR	KINGS FORK RD	EW	0.58	4,070	2,900	(1,170)	9.5	4.6	16.4	8.0
SUF	PRUDEN BLVD	KINGS FORK RD	SUFFOLK BYPASS	EW	1.47	4,061	2,900	(1,161)	13.8	24.0	9.4	16.3
SUF	ROUTE 13/58/460	SUFFOLK BYPASS	CHESAPEAKE CL	EW	3.61	5,370	5,911	541	10.8	359.1	3.0	99.5
SUF	ROUTE 58	SOUTHAMPTON CL	RTE 189/258	EW	1.34	3,047	3,640	593	1.0	4.8	0.7	3.6
SUF	ROUTE 58	RTE 189/258	RTE 272 (S. QUAY RD)	EW	1.26	2,741	3,170	429	0.5	4.1	0.4	3.3
SUF	ROUTE 58	RTE 272	S. QUAY RD (ROUTE 189)	EW	4.17	3,260	3,713	453	3.0	20.2	0.7	4.8
SUF	ROUTE 58 (HOLLAND BYPASS)	S. QUAY RD (ROUTE 189)	BUS RTE 58 (HOLLAND RD)	EW	1.19	3,293	3,751	458	1.3	6.6	1.1	5.5
SUF	ROUTE 58 (HOLLAND RD)	BUS RTE 58 (HOLLAND RD)	RTE 649 (LUMMIS RD)	EW	4.01	3,871	4,350	479	8.2	37.5	2.0	9.4
SUF	ROUTE 58 (HOLLAND RD)	RTE 649 (LUMMIS RD)	RTE 643 (MANNING BRIDGE RD)	EW	2.05	4,073	4,616	543	4.4	28.8	2.2	14.1
SUF	ROUTE 58 (HOLLAND RD)	RTE. 643 (MANNING BRIDGE RD)	COVE POINT DR	EW	1.03	4,876	5,365	489	2.7	15.4	2.6	15.0
SUF	ROUTE 58 (HOLLAND RD)	COVE POINT DR	SUFFOLK BYPASS	EW	1.20	5,279	5,742	463	26.3	18.8	21.9	15.7
SUF	COMMONWEALTH CONNECTOR (RTE 460)	ISLE OF WIGHT CL	SUFFOLK BYPASS	EW	5.13	-	2,900	2,900	-	1.8	-	0.4
SUF	SUFFOLK BYPASS	HOLLAND RD	PITCHKETTLE RD	EW	1.69	4,785	5,956	1,171	10.3	27.9	6.1	16.5
SUF	SUFFOLK BYPASS	PITCHKETTLE RD	PRUDEN BLVD	EW	1.63	2,704	3,830	1,126	1.7	16.5	1.0	10.1
SUF	SUFFOLK BYPASS	PRUDEN BLVD	GODWIN BLVD	EW	1.06	3,162	4,178	1,016	1.2	34.5	1.2	32.5
SUF	SUFFOLK BYPASS	GODWIN BLVD	WILROY RD	EW	1.85	3,999	4,562	563	2.0	124.1	1.1	67.1
SUF	SUFFOLK BYPASS	WILROY RD	ROUTES 13/58/460	EW	2.02	3,306	3,764	458	1.6	40.1	0.8	19.8
SUF	WESTERN FWY	BRIDGE RD	I-664	EW	0.74	1,046	1,615	569	-	1.8	-	2.5
SUF	WESTERN FWY	I-664	COLLEGE DR	EW	0.57	2,066	4,027	1,961	1.5	4.9	2.6	8.5
SUF	WESTERN FWY	COLLEGE DR	PORTSMOUTH CL	EW	0.20	2,492	4,540	2,048	0.6	3.2	3.0	15.9

APPENDIX C:
PUBLIC COMMENTS

The Positioning Hampton Roads for Freight Infrastructure Funding – MAP-21 and Beyond study was released for public comment from January 8, 2014 until January 22, 2014. All public comments and HRTPO staff responses are included in Appendix C.

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HRTPO Public Comment (via email)

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RE: Public Comment Regarding the Positioning Hampton Roads for Freight Infrastructure Funding – MAP-21 and Beyond Draft Report (HRTPO Staff Response Follows Public Comment)

Name: Andy Hecker/FTAC Staff
Date: January 22, 2014
Subject: TPO Freight Infrastructure Funding Comments

Comments were requested for the TPO report presented by Sam, "Positioning Hampton Roads for Freight Infrastructure Funding". Much of the report that contains the abstract on MAP-21, or provides detail data on freight movement stands by itself and no comments are needed. Several brief comments below are warranted:

HRTPO Staff Response:
Thank you for reviewing and submitting comments on the Positioning Hampton Roads for Freight Infrastructure Funding – MAP-21 and Beyond DRAFT report. We have taken your comments into consideration and have provided detailed responses below.

1. On page 8 the first paragraph does not include any details on freight movements beyond trucks. Suggest following the sentence that ends with the word "medicine" Additional statements about rail moving commodities, coal, chemicals, autos, etc. and ports moving international trade by container, Ro-Ro and bulk be added.

HRTPO Staff Response:
In response to your comment, the following sentence has been added to the first paragraph on page 8:

The Port of Virginia conducts international trade of containerized, bulk, break-bulk, and roll-on/roll-off cargo and railroads (e.g. Norfolk Southern and CSX) transport various commodities, such as coal, automobiles, and chemicals.

2. Because of the timing Page 14 goes back and forth between the desired PFN, the actual PFN and what is and isn't included. It is a bit confusing between the "anticipated PFN and the "draft designated" PFN. The first sentence provides a list of segments included in the draft designation of the PFN but not this study. It should probably explain why.

HRTPO Staff Response:
Since the release of our DRAFT version of the study, we have decided to change the name of our network from "Anticipated MAP-21 National Freight Network for Hampton Roads" to "National Freight Network – Hampton Roads Base Network". In response to your comment, we have revised the section on page 14 to include the following:

The draft initial designation of the highway PFN included intermodal connectors and last-mile connections to ports, which were not anticipated by HRTPO staff and regional stakeholders when developing the National Freight Network – Hampton Roads Base Network.

If any of these roadway segments listed above are included in the final PFN, HRTPO staff will include them when completing a planned update to this document.

3. On page 35 the HRBT and 64 segments within Newport News are not shown as severe and on page 36 with the 20 year forecast several segments around Newport news are not "red" severe. Yet on page 41 they show the largest weekday truck volumes and the second largest daily truck volume (10,469) in the 20 year forecast. While not necessarily wrong it is curious why it is not severely congested. If it speaks to it also takes personal vehicles to be the most severely congested that might be an interesting point.

HRTPO Staff Response:
Map 8 (page 35) and Map 9 (page 36) show severe truck delay for locations > 30.01 hrs/mi. We divided the total delay by segment length to "level the field" between short and long segments. The 2010 INRIX average weekday travel speeds are higher than the estimated travel speeds for the 20-year forecast (from the regional travel demand model) for the HRBT and I64 segments within NN/Hampton and therefore do not result in severe truck delays. The high truck volumes in NN for 2010 Existing (8,704) have existing travel speeds near free flow speeds and thus result in lower truck delays. HRBT has lower existing speeds (compared to NN segments), but much less truck volume for 2010 Existing (3,276). Yes, you are correct that as total traffic (including personal vehicles) increase, speeds decrease with congestion and thus result in higher truck delay.

4. On page 43 The 164 segment shows a change in weekday truck traffic expected of 2,048. North on 664 the increase is +595. To the south it shows an increase of +541. Where do the remaining increases go? Is it across the high rise?

HRTPO Staff Response:
We originally received a comment from Virginia Port Authority staff on the Existing and Future Truck Delay in Hampton Roads (September 2013) study that weekday truck volumes on Route 164 (Western Freeway) were low. HRTPO staff reviewed the data and found that future trucks were not fully accounted for at the new APMT facility given the anticipated growth. Staff made modifications to the truck component of the regional travel demand model for future revisions (now based on port TEU forecasts). Staff also adjusted truck volumes on Route 164 (Western Freeway) to account for anticipated growth at APMT. Truck volumes beyond Route 164 (Western Freeway) were not adjusted – when staff performs another update to the study on "future truck delay in Hampton Roads", these new truck volumes will be reflected in surrounding roadways.