

## **1. PURPOSE AND NEED**

### **1.1 INTRODUCTION**

The Virginia Department of Transportation (VDOT), in cooperation with the Federal Highway Administration (FHWA), is preparing a Supplemental Environmental Impact Statement (SEIS) under the National Environmental Policy Act (NEPA) for the Hampton Roads Crossing Study (HRCS) located in the cities of Chesapeake, Hampton, Newport News, Norfolk, Portsmouth, and Suffolk, Virginia. The SEIS re-evaluates the findings of the Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) that were approved by FHWA in 2001.

In the 2001 HRCS FEIS, the purpose for the proposed action was defined as: “...to develop and analyze intermodal alternatives that can work together to improve accessibility, mobility, and goods movement in the Hampton Roads metropolitan area to help relieve the congestion that occurs at the existing Interstate 64 (I-64) Hampton Roads Bridge-Tunnel (HRBT).”

The purpose of the HRCS is to relieve congestion at the I-64 HRBT in a manner that improves accessibility, transit, emergency evacuation, and military and goods movement along the primary transportation corridors in the Hampton Roads region, including the I-64, I-664, I-564, and VA 164 corridors. The HRCS will address the following needs (in the order of presentation in the Purpose and Need section):

- Accommodate travel demand – capacity is inadequate on the Study Area Corridors, contributing to congestion at the HRBT;
- Improve transit access – the lack of transit access across the Hampton Roads waterway;
- Increase regional accessibility – limited number of water crossings, inadequate highway capacity, and severe congestion decrease accessibility;
- Address geometric deficiencies – insufficient vertical and horizontal clearance at the HRBT contribute to congestion;
- Enhance emergency evacuation capability – increase capacity for emergency evacuation, particularly at the HRBT;
- Improve strategic military connectivity – congestion impedes military movement missions; and,
- Increase access to port facilities – inadequate access to interstate highway travel in the Study Area Corridors impacts regional commerce.

The following sections describe the history of the HRCS leading to the development of the HRCS SEIS, the Study Area Corridors and transportation services, and existing and future transportation needs in the Study Area Corridors. The chapter concludes with a purpose statement designed to meet the needs of FHWA and VDOT’s regulatory partners and a summary of the transportation needs discussed earlier in the chapter.

### **1.2 HISTORY OF STUDY**

The HRCS originated with Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) funding to study improvements to relieve congestion at the HRBT. The following presents a brief history of the origins of the current study and actions leading to the commencement of the HRCS SEIS:

- 1991: ISTEA allocated demonstration funds for, "... highway projects demonstrating innovative techniques of highway construction and finance." The I-64 crossing of Hampton Roads was included as one of the innovative projects.
- 1992: The Virginia General Assembly passed Joint Resolution 132 directing VDOT to conduct a study of congestion at the HRBT. The study concluded that short-term measures would not solve congestion at the HRBT and that a long-term, large-scale solution would be required.
- 1997: The I-64 Crossing Major Investment Study was completed resulting in the following milestones: establishment of purpose and need, consideration of alternatives, selection of the locally preferred alternative by the Metropolitan Planning Organization (MPO), and endorsement of the locally preferred alternative by the Commonwealth Transportation Board (CTB).
- 1999: In October the HRCS Draft Environmental Impact Statement (DEIS) was issued.
- 2000: In July the CTB selected a location for the HRCS.
- 2001: The HRCS FEIS and ROD were issued. These documents identified Candidate Build Alternative (CBA) 9 as the preferred alternative. CBA-9 included improvements to the I-664/Monitor-Merrimac Memorial Bridge-Tunnel (MMMBT), the construction of a new east-west bridge-tunnel connecting the MMMBT with I-564 in Norfolk (locally referred to as "Patriots Crossing"), and a north-south bridge connecting "Patriots Crossing" to VA 164 (locally referred to as the "Craney Island Connector").
- 2003: In November FHWA and VDOT completed a NEPA re-evaluation of the HRCS FEIS. The re-evaluation analyzed implementing a portion of the preferred alternative, based on an un-solicited public-private partnership proposal. The data included in the re-evaluation documented that there did not appear to be any changes to the project or the surrounding environment that resulted in significant environmental impacts not already evaluated in the FEIS.
- 2011: FHWA and VDOT completed an Environmental Assessment (EA)/re-evaluation of the HRCS FEIS covering the segments of the preferred alternative that make up "Patriots Crossing".
- 2011: FHWA and VDOT initiated an EIS for the I-64 HRBT corridor.
- 2012: In December FHWA issued a DEIS for the I-64 HRBT corridor.
- 2013: In February VDOT followed up on its 2011 submittal of the EA/re-evaluation for the HRCS FEIS and submitted a revised document and a request for a Finding of No Significant Impact (FONSI). FHWA did not take action on VDOT's request because the project was not properly funded for construction in the Hampton Roads Transportation Planning Organization's (HRTPO) constrained long range plan (CLRP).
- 2015: In July FHWA and VDOT initiated the HRCS SEIS.
- 2015: In August FHWA rescinded its Notice of Intent (NOI) to prepare the HRBT EIS. Public and agency comments and concerns regarding the magnitude of potential environmental impacts from the Build Alternatives proposed in the DEIS led to FHWA's decision to rescind the NOI. The Build Alternatives would have resulted in severe impacts to a variety of environmental resources, including communities and neighborhoods, historic properties, parks, and natural resources. A preferred alternative was not identified by the HRBT EIS study.

### **1.3 STUDY AREA CORRIDORS**

“Hampton Roads” is the name of the water body that is located at the confluence of the James River, the Elizabeth River, the Nansemond River and the Chesapeake Bay. It also is the locally adopted name for the metropolitan region. The Hampton Roads water body divides the region into two sections: the “Southside” which includes Isle of Wight County and the cities of Chesapeake, Norfolk, Portsmouth, Suffolk, and Virginia Beach; and the “Peninsula,” including the cities of Hampton, Newport News, Poquoson, and Williamsburg, as well as James City and York counties.

The three alternatives retained for analysis in the 2001 FEIS, as well as input from the public during the initial scoping phase of the SEIS, were used to establish the Study Area Corridors shown in **Figure 1-1**. These corridors include I-664, I-64, I-564, VA 164, as well as proposed corridors over water and in the vicinity of Craney Island. The new interchanges depicted north of Craney Island and at the southern end of the MMMBT are conceptual, are based on the 2001 FEIS, and are subject to change as described in Chapter 2 Alternatives. The Study Area Corridors are described below.

#### I-64

The I-64 Study Area Corridor extends from 1.7 miles west of the I-664 interchange in Hampton to the I-564 interchange in Norfolk, a distance of approximately 14 miles, including the 3.5-mile long HRBT (**Figures 1-2a to 1-2c**).

#### I-564

I-564 is the primary access between Naval Station Norfolk (NAVSTA Norfolk), Naval Support Activity Hampton Roads (NSA Hampton Roads), and the Norfolk International Terminals (NIT) on the west and I-64 on the east, a distance of approximately 3 miles (**Figures 1-3a to 1-3c**). The HRCS I-564 Study Area Corridor includes the existing I-564 from the I-64 interchange to approximately 1.77 miles northwest where the new I-564 Intermodal Connector alignment turns west and follows the Norfolk Southern rail line through NAVSTA Norfolk and NIT to the shoreline. It proceeds west across the Elizabeth River to a point north of Craney Island. This section is the “I-564 Connector”. The location of the new interchange north of Craney Island shown is based upon the 2001 FEIS and subject to change. The corridor then turns south along the east side of Craney Island until it ties into VA 164. This section is the “VA 164 Connector”.

#### VA 164

Based on public and agency comments, the HRCS SEIS Study Area Corridors have been expanded beyond the limits of the alternatives defined in the 2001 FEIS. This new Study Area Corridor extends east-west along VA 164 approximately 3.4 miles from Virginia International Gateway Boulevard to I-664 (**Figure 1-4**).

#### I-664

The I-664 Study Area Corridor includes the entire 20.8-mile length of I-664 (**Figures 1-5a to 1-5d**). I-664 originates at the I-64 interchange in Hampton on the Peninsula, continues south through the City of Newport News, crosses Hampton Roads via the MMMBT, continues primarily south through the cities of Suffolk and Chesapeake, and ends at the I-264 interchange in the City of Chesapeake. The I-664 Study Area Corridor includes a section extending from the I-564 Connector north of Craney Island to a tie in at the I-664/MMMBT. This section of the corridor is the “I-664 Connector”. The I-664 Connector tie in to the MMMBT as shown is conceptual based on the 2001 FEIS and subject to change.

Figure 1-1: HRCS Study Area Corridors

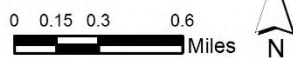


**Figure 1-2a: I-64 Study Area Corridor**

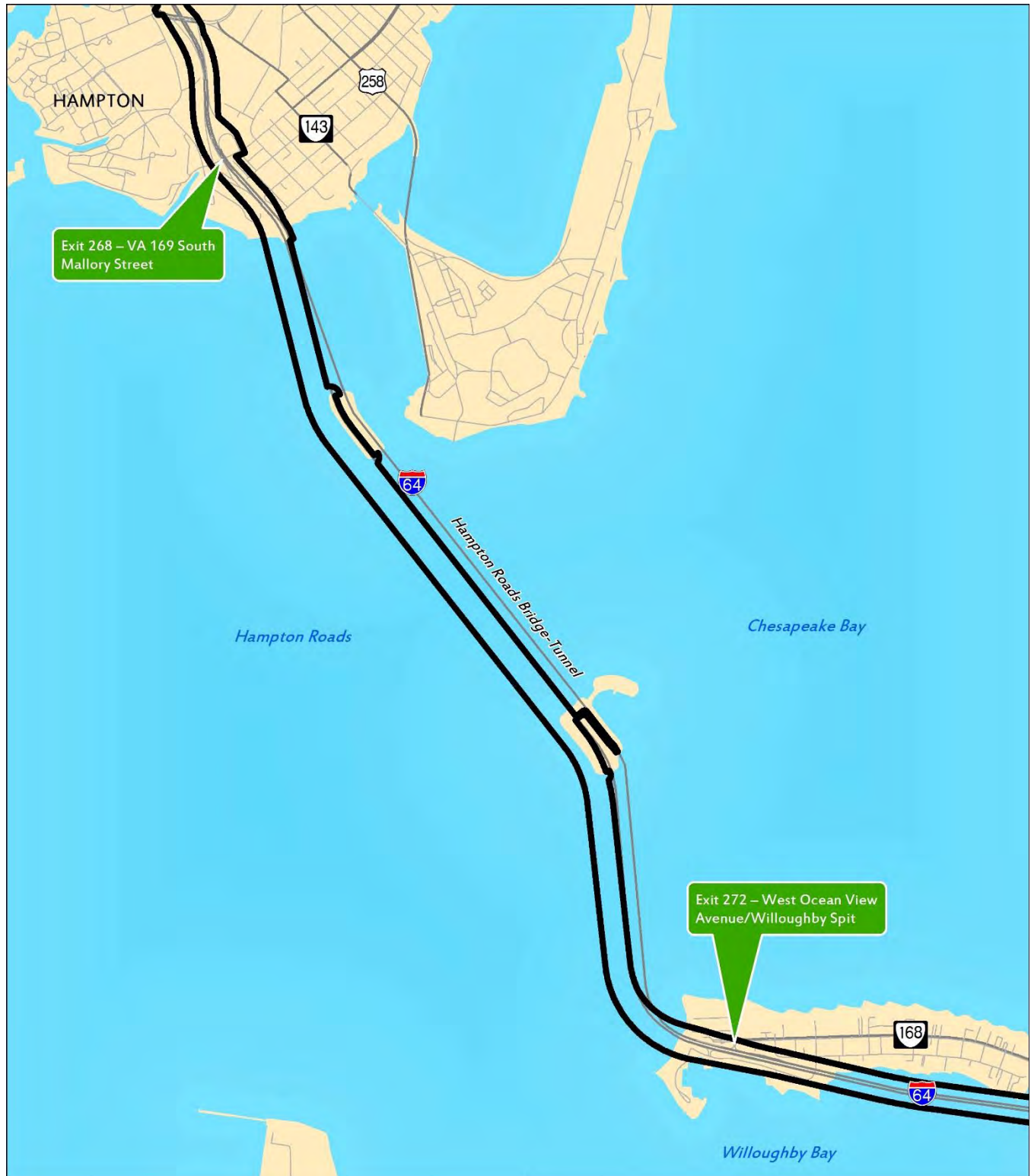


**Legend**

- Study Area Corridor
- Major Roads



**Figure 1-2b: I-64 Study Area Corridor**



**Legend**

- Study Area Corridor
- Major Roads



**HRCS SEIS**  
Hampton Roads Crossing Study SEIS

**I-64 Study Area Corridor**

**Figure 1-2c: I-64 Study Area Corridor**



<p><b>Legend</b></p> <p>— Study Area Corridor</p> <p>— Major Roads</p>	<p>0 0.125 0.25 0.5 Miles</p>	<p>U.S. Department of Transportation <b>Federal Highway Administration</b></p>	<p><b>HRCS SEIS</b> Hampton Roads Crossing Study SEIS</p> <p><b>I-64 Study Area Corridor</b></p>
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**Figure 1-3a: I-564 Study Area Corridor**



<p><b>Legend</b></p> <p>— Study Area Corridor</p> <p>— Major Roads</p> <p>0 0.15 0.3 0.6 Miles</p> <p>North Arrow</p>	<p><b>VDOT</b></p> <p>U.S. Department of Transportation <b>Federal Highway Administration</b></p>	<p><b>HRCS SEIS</b> Hampton Roads Crossing Study SEIS</p> <p><b>I-564 Study Area Corridor</b></p>
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**Figure 1-3b: I-564 Study Area Corridor**



<p><b>Legend</b></p> <p>— Study Area Corridor</p> <p>— Major Roads</p> <p>0 0.15 0.3 0.6 Miles</p> <p>N</p>	<p><b>VDOT</b></p> <p>U.S. Department of Transportation <b>Federal Highway Administration</b></p>	<p><b>HRCS SEIS</b> Hampton Roads Crossing Study SEIS</p> <p><b>I-564 Study Area Corridor</b></p>
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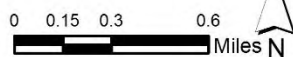
**Figure 1-3c: I-564 Study Area Corridor**



**Legend**

— Study Area Corridor

— Major Roads



**HRCS SEIS**  
Hampton Roads Crossing Study SEIS

**I-564 Study  
Area Corridor**

**Figure 1-4: VA 164 Study Area Corridor**



**Legend**

- Study Area Corridor
- Major Roads



0 0.175 0.35 0.7  
Miles



**HRCS SEIS**  
Hampton Roads Crossing Study SEIS

**VA 164 Study  
Area Corridor**

**Figure 1-5a: I-664 Study Area Corridor**



<p><b>Legend</b></p> <p>— Study Area Corridor</p> <p>— Major Roads</p> <p>0 0.15 0.3 0.6 Miles</p> <p>N</p>	<p><b>VDOT</b></p> <p>U.S. Department of Transportation <b>Federal Highway Administration</b></p>	<p><b>HRCS SEIS</b> Hampton Roads Crossing Study SEIS</p> <p><b>I-664 Study Area Corridor</b></p>
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**Figure 1-5b: I-664 Study Area Corridor**



<p><b>Legend</b></p> <p>— Study Area Corridor</p> <p>— Major Roads</p> <p>0 0.15 0.3 0.6 Miles</p> <p>N</p>	<p><b>VDOT</b></p> <p>U.S. Department of Transportation <b>Federal Highway Administration</b></p>	<p><b>HRCS SEIS</b> Hampton Roads Crossing Study SEIS</p> <p><b>I-664 Study Area Corridor</b></p>
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**Figure 1-5c: I-664 Study Area Corridor**



**Legend**

— Study Area Corridor

— Major Roads

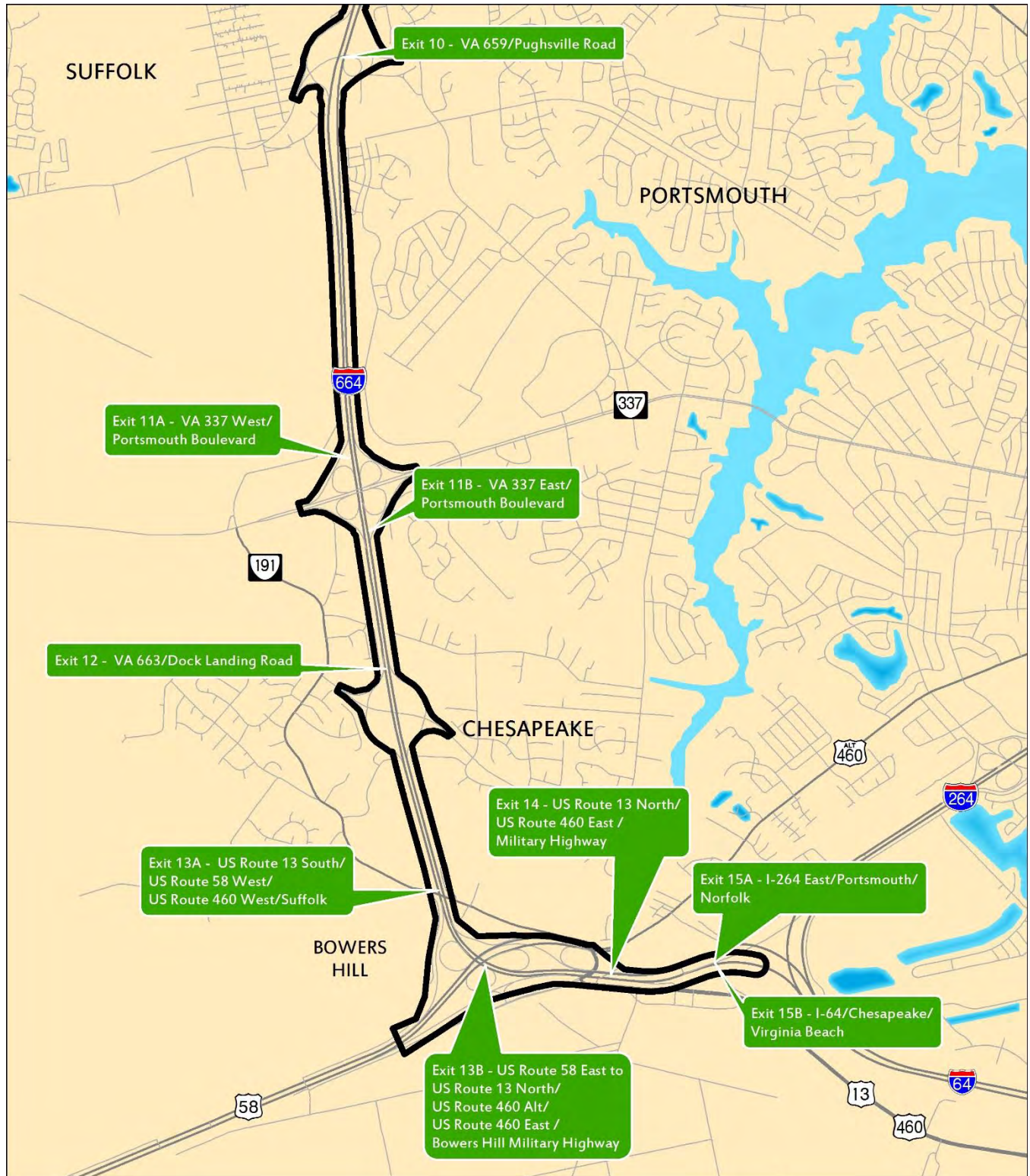
0 0.15 0.3 0.6  
Miles



**HRCS SEIS**  
Hampton Roads Crossing Study SEIS

**I-664 Study Area Corridor**

**Figure 1-5d: I-664 Study Area Corridor**



<p><b>Legend</b></p> <p>— Study Area Corridor</p> <p>— Major Roads</p> <p>0 0.15 0.3 0.6 Miles</p> <p>N</p>	<p><b>VDOT</b></p> <p>U.S. Department of Transportation <b>Federal Highway Administration</b></p>	<p><b>HRCS SEIS</b> Hampton Roads Crossing Study SEIS</p> <p><b>I-664 Study Area Corridor</b></p>
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## **1.4 NEEDS: EXISTING CONDITIONS**

### **1.4.1 Overview**

I-64 and I-664 are critical links in the regional transportation network of the Hampton Roads region. The region has extensive bodies of water that narrow transportation choice. When congestion is severe or incidents occur at the HRBT, traffic diverts to the only two other crossings of the Hampton Roads waterway: the MMBBT or the James River Bridge that are already severely congested at peak travel times.

The I-64, I-664, I-564, and VA 164 Study Area Corridors serve multiple transportation purposes, including commuter, freight movements, military mobility, tourism, and emergency evacuation. However, traffic capacity is inadequate at peak travel times on all these corridors, leading to reduced speeds and long and unpredictable travel times and congestion. These factors impact regional transportation accessibility as described below.

### **1.4.2 Accommodate Travel Demand**

Travel demand on I-64, I-564, I-664, and VA 164 is generated by various modes including commuters, freight movements, military, and tourism. Recent population estimates indicate 1,677,338 persons live in the Hampton Roads area of which 835,342 are in the civilian labor force in the region (US Census Bureau, 2013; Virginia Economic Development Partnership, 2015). The Hampton Roads interstate network provides a vital regional link for commuters traveling to and from large regional employers and institutions, such as:

- **US Military Installations:** More than 20 military installations are located in the greater Hampton Roads area (see Section 1.3.6). These military installations are major employers with approximately 136,000 personnel that contribute to travel demand in the Hampton Roads region (US Bureau of Economic Analysis, 2014).
- **The Port of Virginia:** Located in Hampton Roads region, Richmond and Warrenton County, the Port of Virginia handled 19.7 million tons of cargo in 2015, ranking Virginia the fifth largest port in the nation (Port of Virginia, 2015a). The Port of Virginia generates primarily truck traffic using the HRCS Study Area Corridors. The majority of other cargo is shipped via rail along a primary route extending from the Newport News Marine Terminal along the Peninsula to points northwest, and Southside routes heading west from NIT, Portsmouth Marine Terminal, and Virginia International Gateway terminal through the City of Suffolk to points further west (**Figure 1-6**). No rail water crossings over Hampton Roads currently exist. The decision to ship goods from the port on truck or rail is not made solely on the availability of rail facilities and transport. Factors considered in the decision to use trucks versus rail include the time sensitivity of cargo, availability of and proximity to intermodal rail facilities, efficiency/accessibility of highway networks, cargo weight and volume, and fuel cost (Port of Virginia, 2015b).
- **Newport News Shipbuilding:** This shipyard is accessed via I-664 and is located at the mouth of the James River in the City of Newport News. It is the nation's sole-industrial designer, builder, and re-fueler of nuclear-powered aircraft carriers and is one of only two shipyards in the US capable of designing and building nuclear-powered submarines.
- **Sentara Health Care:** Headquartered in the City of Norfolk, Sentara has 20,000 employees, making it the second-largest employer in the Hampton Roads metropolitan area (Hampton Roads



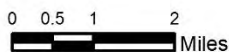
**Figure 1-6: Hampton Roads Major Ports**



**Legend**

— Study Area Corridors

— Major Roads



**HRCS SEIS**  
Hampton Roads Crossing Study SEIS

**Hampton Roads  
Major Ports**

Economic Development Alliance (HREDA), 2015). Sentara health care facilities are located throughout the region and accessed by all major roads in the area.

- Bank of America: Located in the City of Norfolk, the bank has an estimated 3,600 employees (HREDA, 2015).
- Old Dominion University: Located in the City of Norfolk, the university has 4,000 employees (HREDA, 2015) and approximately 25,000 students.
- Naval Medical Center: Located in the City of Portsmouth, the hospital with 5,400 employees (HREDA, 2015) is accessed indirectly by VA 164.

Major tourism and recreation in the region centers on the beach fronts, historic sites and museums, and regional city centers. Other major destinations for travelers through Hampton Roads are the Eastern Shore via the Chesapeake Bay Bridge-Tunnel; and the Outer Banks of North Carolina via I-64 and I-664 to Route 168 in the City of Chesapeake. Much of the tourist-related traffic is seasonal and related to the beaches, resulting in summertime peaks in traffic volumes that are higher than typical weekday peaks. Virginia Beach alone hosts nearly six million overnight visitors annually (City of Virginia Beach, 2015).

I-64, I-564, and I-664 and VA 164 provide for other general travel for business and personal purposes between and within the cities of Hampton Roads, including shopping, recreation, and entertainment. Regional shopping destinations near the Study Area Corridors include: MacArthur Center in downtown Norfolk; Peninsula Town Center in the City of Hampton; City Center at Oyster Point and Patrick Henry Mall in the City of Newport News; High Street in the City of Portsmouth; Greenbrier and Chesapeake malls in the City of Chesapeake; and Town Center, Pembroke and Lynnhaven Malls in the City of Virginia Beach. Recreation on the water is a major activity in the region, including boating and fishing, particularly near the HRBT and MMMBT. Major regional entertainment venues include Town Point Park and Scope in the City of Norfolk, the Coliseum in the City of Hampton, NTelos Wireless Pavilion in the City of Portsmouth, and the Virginia Beach oceanfront.

Pedestrian and bicycle recreation are popular activities and modes of transportation in the Hampton Roads region. Currently bicycle and pedestrian travel across the HRBT and MMMBT specifically are prohibited by CTB policy regarding such use on limited access highways (VDOT, 2015a).

Linking most of the urbanized region, the Study Area Corridors are also a pipeline for the transport of goods of all kinds, including industrial supplies, building materials, foodstuffs, and business and personal consumables. Interstates 64, 564, 664, and VA 164 serve as routes for the transfer and delivery of local and regional freight movements across Hampton Roads. They also are a key link in transporting international freight to and from the region's shipping ports. For example, the Port of Virginia facilities in Hampton Roads handled over 18 million short tons of cargo during the first 11 months of Fiscal Year 2015 (Port of Virginia, 2015b).

Travel demand from these sources within the Study Area Corridors have resulted in 2015 traffic volumes on the study alignments as shown in **Table 1-1**. Higher travel demand exists on the I-64 Study Area Corridor because it has more direct connections to regional destinations; I-64 is the only interstate into and out of the Hampton Roads region.

**Table 1-1: Existing (2015) Traffic Volumes**

Roadway	Average Annual Daily Traffic	Average Weekday Daily Traffic	Eastbound AM (PM) Peak Hour	Westbound AM (PM) Peak Hour	Average Annual Daily Traffic Percent Trucks
HRBT (I-64)	86,400	89,200	3,375 (3,105)	3,070 (3,025)	3%
MMMBT (I-664)	61,000	64,300	2,080 (3,195)	3,060 (2,550)	6%
I-564 <sup>1</sup>	37,000	45,000	970 (3,945)	3,760 (1,230)	1%
VA 164 <sup>1</sup>	45,000	50,800	2,365 (2,150)	1,860 (2,635)	5%

<sup>1</sup>2014 data

### 1.4.3 Improve Transit Access

Hampton Roads Transit (HRT) is the major provider of public transportation throughout Hampton Roads. In the Study Area Corridors, HRT express bus service that travels through both the HRBT and MMMBT is called the ‘Metro Area Express’ (MAX). **Figure 1-7** and **Table 1-2** present the MAX routes on Study Area Corridors. MAX across the HRBT and MMMBT is the only public transit option that connects the Peninsula with the Southside.

The railway network in Hampton Roads provides transit mobility. Transit rail in the Hampton Roads region is provided via Amtrak, which has a station in the cities of Newport News and Norfolk, and the City of Norfolk light rail transit called “The Tide.” Amtrak provides daily trips out of the City of Norfolk to Petersburg and destinations north and from the Newport News Station to Richmond where further connections may be made. These lines are part of the Northeast Regional Service provided by Amtrak extending from the City of Newport News to Boston. The Tide is a light rail system operated by HRT within the confines of the City of Norfolk, with plans to expand the system into a regional light rail system. Extensions toward NAVSTA Norfolk and the City of Virginia Beach are currently being studied that evaluate Tide alignments along I-64 to the I-564 interchange, along I-564 northwest beyond the Study Area Corridors, and Hampton Boulevard (HRT, 2015a).

In 2011, the Virginia Department of Rail and Public Transportation (DRPT) in cooperation with others identified transit needs in Hampton Roads from a regional perspective (DRPT et al., 2011). Their report identifies the need for planning, building and maintaining an integrated, high-speed/high-capacity transit system that would help relieve traffic congestion and connect activity centers throughout Hampton Roads. The plan calls for additional crossings over Hampton Roads, including dedicated transit facilities should improvements be made to the HRBT or a third crossing be developed. Based on the findings of this effort and other previous studies, there is a need to improve accessibility to transit connections across Hampton Roads.

### 1.4.4 Increase Regional Accessibility

Regional transportation accessibility focuses on people and places, that is, getting people and goods to destinations in high demand. It is enhanced by increasing the speed one can travel to reach a destination and the subsequent reduction in travel time. Moreover, for transportation to be accessible, it needs to be reliable so that people and goods arrive as planned.

**Figure 1-7: MAX Routes**



**Legend**

— Study Area Corridors	— Route 922
— Major Roads	— Route 961
— Route 918	— Route 965
— Route 919	— Route 967

0 0.5 1 2 Miles

**VDOT**  
U.S. Department of Transportation  
**Federal Highway Administration**

**HRCS SEIS**  
Hampton Roads Crossing Study SEIS  
**HRT**  
**MAX Routes**

**Table 1-2: Metro Area Express Bus Transit Service on Study Area Corridors**

Route Number	City Connection	Route Termini	Study Area Corridors Overlap
918	Virginia Beach – Norfolk	Silver Leaf Park & Ride to Lafayette River Annex	Uses I-64
919	Virginia Beach-Norfolk	Silver Leaf Park & Ride NAVSTA Norfolk	Uses I-564, I-64, and HRBT
922	Chesapeake – Norfolk	Greenbrier Mall to Naval Station Norfolk	Uses I-64 and I-564
961	Norfolk – Newport News	Downtown Norfolk to Newport News Transit Center	Uses I-64, HRBT, and I-664
965	Newport News - Norfolk	Patrick Henry Mall to NAVSTA Norfolk	Uses I-64, HRBT, and I-564
967	Norfolk – Newport News	Military Highway Light Rail Station to Newport News Transit Center	Uses I-664 and MMMBT

Source: HRT (2015b)

**Increase Capacity**

Inadequate capacity leads to congestion which has an adverse effect on travel time and travel reliability. Traffic volumes on sections of I-64, I-664, I-564 and VA 164 routinely exceed capacity during peak periods. The generally accepted capacity of a single freeway lane is 2,200 vehicles per hour; however, potential capacity is reduced when considering factors such as narrow lanes, lack of shoulders, and high truck volumes (**Table 1-1**). Due to constricted horizontal and vertical clearances, tunnels provide less capacity than do landside roadways. HRTPO estimated the volume of vehicles crossing Hampton Roads via the HRBT, MMMBT, and James River Bridge increased 74 percent from 1990 to 2013. Most of this growth can be attributed to the MMMBT construction in 1992 (HRTPO, 2014a). Maximum existing capacity at the HRBT is estimated at 1,600 vehicles per hour per lane and 1,630 vehicles per hour per lane at the MMMBT.

Additional issues affect capacity at the bridge-tunnels in the Study Area Corridors. At the HRBT, lane drops and merges in close proximity to the tunnels contribute to bottleneck conditions and substantial traffic backups in both directions. Along I-564, inadequate capacity occurs during peak travel hours due to military gate constrictions that can back traffic up to I-64 in the morning. Currently, I-564 ends by transitioning to east-west oriented Admiral Taussig Boulevard which serves the NAVSTA Norfolk base, naval docks, and the NIT. Admiral Taussig Boulevard also has inadequate capacity at peak morning travel hours, causing traffic to back up on northbound I-564. The I-564 Intermodal Connector project, currently under construction, will address these issues, in part, by providing the port, NAVSTA Norfolk docks, and relocated Navy Gate 6 with direct access to I-564 via a new alignment and interchange (**Figure 1-8**).

**Figure 1-8: I-564 Intermodal Connector Project**



<p><b>Legend</b></p>	<p>— I-564 Intermodal Connector</p>	<p>— Major Roads</p>	<p>0 0.125 0.25 0.5 Miles</p>		 	<p><b>HRCS SEIS</b> Hampton Roads Crossing Study SEIS <b>I-564 Intermodal Connector Project</b></p>
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The proposed “Air Terminal Interchange” on I-564 (listed in the 2040 Long Range Transportation Plan) would provide improved access to other Navy gates. On the VA 164 Study Area Corridor, inadequate capacity can occur from the Cedar Lane interchange eastward during peak morning travel times.

The existing bridge-tunnels also do not provide sufficient capacity to allow for efficient maintenance of traffic during inspection, routine maintenance, or construction activities. Most routine maintenance results in shoulder closures or single lane closures within limits of operations or on isolated weekends. In some cases, during maintenance or construction at the HRBT or MMMBT, travel lanes may close altogether, requiring two-way traffic in a single tunnel tube and reducing capacity to one lane in each direction for an extended period of time without a viable detour. These activities result in substantial periodic congestion and delays beyond the congestion experienced during normal operation.

### **Relieve Congestion**

When travel demand exceeds capacity, congestion occurs. Congestion can be described as a condition characterized by unstable traffic flow, reduced travel speeds, stop-and-go movements, travel delays, and queuing. Congestion within the Study Area Corridors occurs in two forms: 1) on a regular basis at the same general location which is caused by inadequate capacity to accommodate traffic volumes; and, 2) on an irregular basis at varying times and locations. Causes of irregular congestion include weather events, crashes that obstruct the roadway, or other incidents that temporarily reduce capacity. Because peak traffic severely exceeds existing capacity and there are only three crossings connecting the Peninsula to the Southside (HRBT, MMMBT, and the James River Bridge), irregular incidents during peak travel times can cause prolonged traffic jams that essentially bring the I-64 and I-664 corridors to a standstill, which in turn has a domino effect on traffic on intersecting roadways. For example, at the HRBT, a recent study by the Transportation Research Institute at Old Dominion University (Cetin et al., 2015) found 28 percent of the total delays are incident-induced, and the incident duration of the worst vehicle accidents extended over an hour. The mean duration of both east and westbound incidents was five minutes or less. The time for the incident-induced queues to dissipate may extend beyond the duration of the incident itself; however, a reliable estimate of typical queue dissipation times is difficult to obtain, because queue dissipation time depends on many factors such as time of day and the presence of recurring congestion, weather conditions, incident type and duration, number of affected lanes, etc.

According to VDOT, traffic must be stopped in both directions at the HRBT to allow westbound over-height trucks to turn around. A total of 1,655 such incidents occurred in 2015, averaging between four and five times a day (VDOT, 2016a). A recent Virginia law (Code of Virginia 46.2-1110) allows drivers of such trucks to divert to a parking area to wait until peak travel times are passed in lieu of stopping traffic in both directions to turn around and to avoid a fine. Factors contributing to nonrecurring and recurring congestion at bridge-tunnels in general include the abrupt transition from daylight to dark lighting conditions in the tunnel, limited line-of-sight caused by tunnel structures, low overhead clearance, and the grades going down into and coming up out of the tunnels. These factors lead to fluctuations in travel speeds and disruptions in the traffic stream (FHWA, No Date; Smiley and Dewar, 2010). In the Hampton Roads area, narrow lanes and a lack of shoulders also contribute to congestion at the tunnels.

Sources of congestion at the HRBT have been studied numerous times. Most recently, the study by the Transportation Research Institute at Old Dominion University (Cetin et al., 2015) found that in the eastbound direction, the bottleneck is commonly observed at the tunnel entrance and inside the tunnel. In the westbound direction, it is generally at three locations: the tunnel entrance, inside the tunnel, and at the West Ocean View interchange ramp. The study concludes the HRBT corridor experiences a

significant level of congestion and delays, costing the traveling public approximately 1.13 million vehicle-hours or \$33.2 million annually in lost productivity, vehicle operation cost, and lost fuel (based on 2013 data). Of the total delay, the study identifies 72 percent is due to high volume while the rest (28 percent) is incident-induced. Over-height trucks contribute the most to incident-induced delays. Stopping the traffic to process over-height trucks cost \$2.58 million annually whereas all crashes in 2013 cost \$2.56 million annually. Disabled vehicles also contribute significantly to the incident-induced delays costing \$2.2 million.

In the most recent assessment of regional congestion by HRTPO (2014a), the HRBT segment of I-64 is ranked as the most congested freeway in the region. Nearly the entire I-64 roadway in the study limits is ranked among the most highly recurring and nonrecurring congested roadways in the Hampton Roads region, particularly in the afternoon peak period. The section of I-564 from Admiral Taussig Boulevard to Terminal Boulevard has high recurring congestion at that time, which may be partly relieved by the I-564 Intermodal Connector project. The sections of southbound I-664 on the Peninsula from Terminal Avenue to the MMMBT, on the Southside southbound from VA 164 to Pughsville Road, and northbound I-664 from Bowers Hill also have severe recurring congestion during the afternoon peak travel period.

Traffic studies often characterize congestion based on the Level of Service (LOS) concept. Level of Service is a letter-grade description of the quality of traffic flow, ranging from A (best) to F (worst). LOS is often used to assess the operational impacts of proposed alternative improvements. Several factors are considered in assessing LOS, as detailed in the *HRCS Traffic and Transportation Technical Report*. A minimum LOS has not been established for use in the HRCS purpose and need analysis primarily because LOS values may not be reasonably attainable in some situations, including heavily congested conditions such as occurs in the Study Area Corridors. FHWA revised policy (Memorandum May 6, 2016) also clarifies that the agency does not have regulations or policies that require specific minimum LOS values for improvement projects on the National Highway System (NHS). The NHS is a network of strategic highways that includes the Interstate Highway System as well as other roads important to the nation's economy, defense and mobility. Therefore, other performance measures may be used such as travel delay and travel reliability, as described below.

The HRTPO congestion study indicates the sections of HRCS interstate Study Area Corridors with the highest total delay per mile in the morning peak period in 2013 included eastbound I-64 from Armistead to Mallory Street interchanges in the City of Hampton with up to 194.5 total hours of delay per mile (**Figure 1-2A**). The northbound section of I-564 from Admiral Taussig Boulevard to Terminal Boulevard interchange in the City of Norfolk also has substantial travel times with up to 89.6 total hours of delay per mile (**Figure 1-3A**). In the afternoon/evening, the highest total delay per mile on I-64 extended westbound from Granby Street to Ocean View Avenue in the City of Norfolk with up to 257.7 total hours of delay per mile (**Figure 1-2C**). In the evening, I-64 eastbound from Rip Rap Road to Mallory Street in the City of Hampton has up to 214.0 total hours of delay per mile (**Figure 1-2A**). Sections of I-664 are in the top regional rankings for segments with the highest total delay per mile in the evening peak period, including southbound from Chestnut Avenue to Terminal Avenue in the City of Hampton with up to 148.4 total hours of delay per mile (**Figure 1-5A**). The severe congestion causing such high delay hours per mile translate into person-hour delay for travelers.

Queue lengths approaching the HRBT typically extend 3 to 5 miles long (depending on direction and time of day), which are another indicator of declining transportation accessibility. At the MMMBT, queue lengths typically extend from 2 to 3 miles southbound at peak travel times. On I-564 at the Gate 3A



interchange, traffic queued to enter Gate 3A at NAVSTA Norfolk can extend along northbound I-564 to I-64. The chokepoint causes recurring congestion to spill back to upstream locations, thereby reducing throughput at those locations as well. Additionally, because transit buses use general purpose travel lanes, the queuing and delays also impact transit services.

Severe recurring congestion occurs at the HRBT and along the I-64 Study Area Corridor. If irregular incidents occur during peak travel times, the I-64 corridor can experience prolonged traffic jams that disrupt the traffic stream, essentially shutting down mobility in the corridor. Drivers intending to avoid the HRBT may divert to the only other alternative crossings that connect the Southside to the Peninsula, which are the MMMBT and the James River Bridge. Moreover, both the MMMBT and sometimes the James River Bridge also experience severe congestion during the same peak travel times as at the HRBT (HRTPO, 2014a) and do not serve as an effective alternative. In severe incidents, gridlock occurs at all the major crossings connecting the Southside to the Peninsula.

Travel “reliability” is defined as how steady travel times are over the course of time, as measured generally from day to day. As traffic flows approach and exceed capacity and travel speeds decrease, travel times through the corridors become unpredictable. The higher traffic densities result in vehicles being more closely spaced, increasing the interaction among vehicles and distractions to drivers. The flow becomes unstable and abrupt stop-and-go traffic movements occur, a condition commonly experienced by local commuters and visitors to the region. Because of the unstable nature of the traffic flow, the exact onset, severity, and frequency of the congested conditions can be difficult to predict and the actual travel time may vary considerably from the average from one day to the next, especially when crashes or breakdowns result in lane restrictions or closures. Such incidents result in nonrecurring congestion, which compounds normal expected congestion and increases the unreliability of travel times in the corridor. A measure of the recurring and non-recurring delay that is typically experienced is expressed in the Travel Time Index (TTI), which is the ratio between travel time under free-flow, uncongested conditions and typical congested flow. For the HRBT, the HRTPO estimates that in 2013 the average annual TTI for the HRBT was as high as 1.85, which means that average peak period travel time is 85 percent higher than under free-flow conditions (HRTPO, 2013a). Higher TTIs have been observed during peak summer Fridays.

The same roadways in the Study Area Corridors with the highest total delay per mile discussed above also rank as having the most unreliable travel times in comparison to free-flow traffic conditions for the study routes, particularly at the HRBT (HRTPO, 2014a). Drivers wishing to avoid the highly unreliable travel times at the HRBT are limited to accessing the Peninsula or Southside at the two other crossings available (i.e., MMMBT and James River Bridge); however, these crossings also have unpredictable travel conditions at the same peak travel times as the HRBT. As described above, during irregular, severe traffic incidents, travel delay could extend for several hours at all the major Hampton Roads crossings.

#### **1.4.5 Address Geometric Deficiencies**

Geometrically deficient components on I-64 and at the HRBT include inadequate shoulder width and substandard vertical tunnel clearance, both of which contribute to recurring congestion. These elements fail to meet current VDOT interstate design standards, the American Association of State Highway and Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets*, and AASHTO’s *Guide Specifications for Bridges Vulnerable to Coastal Storms* (AASHTO 2008; 2011). Posted vertical tunnel clearance in the existing westbound HRBT tunnel is 13’-6”, below the 14’-6” vertical clearance standard for interstates. An average of 135 westbound over-height trucks per month must be stopped and inspected on the HRBT, causing disruption to traffic flow. Vertical clearance at the MMMBT is 14’-6” in

both directions. Over-height vehicles are usually not an issue at the eastbound HRBT or at the MMMBT because any vehicles taller than 14'6" would require a permit to travel on interstate and state roadways and would be unable to pass under most bridges. All of these deficiencies contribute to congestion at the HRBT when traffic volumes are high or severe weather events occur. At the HRBT, the vertical clearance above the water on the approach bridges does not meet AASHTO standards. Thus, water could overtop the bridge structures during a severe storm, reducing evacuation options.

Incident response and management is difficult due to limited space in the tunnels and on the tunnel approach bridges and the lack of viable detour options to maintain traffic flow. **Table 1-3** compares the total number of crashes and average crash rate per 100 million vehicle miles traveled for the Study Area Corridors and the VDOT Hampton Roads District. Average crash rates on the I-64 Study Area Corridor are substantially higher than the 2013 VDOT average crash rate for Hampton Roads District interstates. On I-64, the eastbound crashes were concentrated where the number of lanes reduce from three to two. The most westbound crashes on I-64 occur near Bayville Street and the westbound HRBT portal. On I-664, the crashes were generally concentrated on the approaches to the northbound and southbound bridge-tunnels. Crashes in both directions on I-564 are concentrated near I-64. Eastbound crashes occurred primarily near the Portsmouth Marine Terminal east of the VA 164 Study Area Corridor. Many crashes on westbound VA 164 occurred near I-664. The majority of reported crashes in the Study Area Corridors were rear-end collisions, which are indicative of congested stop-and-go conditions. As geometric deficiencies contribute to safety and congestion issues, there is a need to address these conditions.

**Table 1-3: Total Crashes and Average Crash Rates in the Study Area Corridors and VDOT Hampton Roads District**

Roadway	From	To	Direction	Corridor Length (miles)	2012-2014 Total Crashes	Average Crash Rate <sup>1</sup>
Statewide Interstates	n/a	n/a	n/a	n/a	16,139 <sup>2</sup>	67.56 <sup>2</sup>
VDOT Hampton Roads District Interstates <sup>3</sup>	n/a	n/a	n/a	n/a	3,781 <sup>2</sup>	81 <sup>2</sup>
VDOT Hampton Roads District Primary Roads	n/a	n/a	n/a	n/a	2,030 <sup>2</sup>	95 <sup>2</sup>
I-64	I-664	I-564	Eastbound	12.51	930	152
I-64	I-664	I-564	Westbound	13.37	800	135
I-564	I-64	Admiral Taussig Boulevard	Northbound	2.77	71	86
I-564	I-64	Admiral Taussig Boulevard	Southbound	2.64	65	125
I-664	I-64	I-264	Northbound	20.57	588	71
I-664	I-64	I-264	Southbound	20.79	531	71
VA 164	I-664	US 58	Eastbound	6.9	73	22
VA 164	I-664	US 58	Westbound	6.9	55	16

Source: Virginia Department of Motor Vehicles (DMV) (2013); VDOT (2013b)

<sup>1</sup>Average crash rate per 100 million vehicle miles traveled.

<sup>2</sup>2013 data only (DMV, 2013).

<sup>3</sup>I-64, I-95, I-264, I-464, I-564, I-664.

#### **1.4.6 Enhance Emergency Evacuation Capability**

As a coastal metropolitan area, the Hampton Roads region is highly susceptible to hurricanes and nor'easter storms that combine high winds with storm surge and torrential rains to cause flooding. In the event of an emergency, designated evacuation routes in the Hampton Roads region include I-64, I-664, I-264, US Route 13, US Route 17, US Route 60, US Route 58, US Route 460, and US Route 10. The Chesapeake Bay Bridge-Tunnel is not a designated evacuation route and will shut down under certain severe weather conditions. Among these routes, I-64 is the only route where the lane reversal infrastructure is set up for emergency purposes. According to the 2013 Virginia Hurricane Evacuation Guide (VDOT, 2013a), residents south of I-264 are directed to use I-64/I-264; I-664 North, US Route 17 North; US Route 58 West; US Route 10 West; and US Route 460 West for hurricane evacuation. Residents of the cities of Norfolk and Virginia Beach located north of I-264 are directed to use I-64 and the HRBT in the event of a hurricane evacuation.

The tunnels are equipped with storm doors which can be shut to prevent flooding. While this would preserve the tunnel structure, it would close off a vital route for evacuees and/or emergency personnel. Theoretically, the call for an evacuation would occur sufficiently in advance of a storm event to allow the population to leave the area, even if routes are cut off. However, given the unpredictable nature and path of some storm events, the call to evacuate sufficiently in advance of a storm event to allow the population to safely leave the area is not always possible.

In April 2010, the United States Department of Transportation (USDOT) prepared a report entitled "Highway Evacuations in Selected Metropolitan Areas: Assessment of Impediments" (USDOT, 2010). This report focused on the highway system's ability to safely evacuate large numbers of people from 26 metropolitan areas that are high-threat, high-density areas. The Hampton Roads area, identified in this report as the cities of Virginia Beach, Norfolk and Newport News, was the 31st most congested area in the country and 35th most densely populated. It identifies five top highway impediments to effective large-scale, mass evacuations. Among these impediments are water crossings. There are a limited number of crossings that can handle the large volume of traffic that would have to evacuate from the area in case of an emergency. There are a limited number of water crossings in the Hampton Roads region, hampering the ability to effectively evacuate the population. These crossings are known bottlenecks during daily traffic and are expected to be more so during evacuations. Although each crossing has measures in place to ensure they are not blocked by flooding or other events during evacuations, the HRBT bridges have substandard vertical clearance above the water and may be overtopped in heavy storms. Another impediment to evacuation is that the Hampton Roads region is low lying, and US 17, US 460, and US 58 are prone to flooding, further exacerbating evacuation conditions even after evacuees make it past the available water crossings.

#### **1.4.7 Improve Strategic Military Connectivity**

I-64, I-564, I-664, and VA 164 provide for the movement of military personnel and equipment within the Study Area Corridors. These roadways are part of the Strategic Highway Network (STRAHNET), which is designated by FHWA in coordination with the US Department of Defense (DoD) (US Army, 2012). STRAHNET is the network of highways that are deemed necessary to the United States' strategic defense policy. The STRAHNET provides access, continuity, and emergency capabilities to important military installations and ports. Military installations in the Hampton Roads region include:

- NAVSTA Norfolk
- NSA Hampton Roads
- Norfolk Naval Shipyard
- Joint Forces Staff College
- Lafayette River Annex
- Camp Allen
- Portsmouth Naval Hospital
- St. Juliens Creek Annex
- US Coast Guard Station near Craney Island
- Craney Island US Naval Supply Center
- Joint Expeditionary Base Little Creek – Fort Story
- Naval Air Station Oceana
- Dam Neck Naval Base
- Virginia National Guard Camp Pendleton
- Naval Auxiliary Field Fentress
- Langley Air Force Base
- NASA Langley Research Center
- Fort Eustis
- Camp Peary
- Yorktown Naval Weapons Station
- Naval Supply Center Cheatham Annex

Currently, the only access to the Navy installations from I-564 is via the Gate 3A interchange and via the I-564 terminus where it transitions to Admiral Taussig Boulevard. I-564 currently terminates at Admiral Taussig Boulevard that continues northwest toward the NAVSTA Norfolk docks. The NAVSTA Norfolk docks are currently only accessed via local roads northwest of the I-564 terminus. However, several projects are underway to improve their access. As mentioned above, the I-564 Intermodal Connector project will provide the NAVSTA Norfolk docks and Navy Gate 6 direct access to I-564 via a new alignment and other Navy gates would potentially gain direct access via the proposed Air Terminal Interchange.

US Navy comments on previous studies involving the HRCS and HRBT indicate military missions and operations in Hampton Roads have substantially changed since the 2001 HRCS FEIS as security is a greater need today. Major realignment of missions affecting the distribution of Navy personnel and logistics have occurred as well (US Navy, 2012). The US Navy considers the severe congestion at the HRBT, on I-564, and other study routes as impairing the Navy mission and mobility.

Approximately 136,000 military and civilian personnel are located at military installations in the Hampton Roads region (US Bureau of Economic Analysis, 2014). In its 2011 Hampton Roads Military Transportation Needs Study, HRTPO reported that transportation congestion on the HRBT might hinder the ability to maintain or bring additional military personnel to the region; increases travel times between military installations during business hours, and detracts from mission performance effectiveness and efficiency (HRTPO, 2011a). Congestion on other STRAHNET roadways, including I-664, I-564, and VA 164, coupled with the limited number of major crossings over Hampton Roads also impede military mobility.

The majority of military personnel live off base and face a daily commute throughout the region. Additionally, daily occupational duties require travel in between any number of the military installations found throughout Hampton Roads and other installations in Virginia and the District of Columbia. Efficient

military operations require a sufficient transportation network so that cargo and personnel can be moved as quickly and as safely as possible.

In addition, the Ports for National Defense (PND) Program identifies and assesses the adequacy and responsiveness of defense-important infrastructure at ports that support DoD deployments. The PND Program has identified the Port of Virginia (including the NIT, Newport News, and Portsmouth Marine terminals) as one of the designated strategic seaports on the east coast (HRTPO, 2011a). STRAHNET roadways into these terminals are severely congested at peak travel times, adversely affecting military mobility.

Military mobility is currently impeded by insufficient local transportation infrastructure in the Study Area Corridors. In 2009, the HRTPO was notified by the military that congestion and delays at bridges and tunnels impedes mission performance effectiveness and efficiency. In fiscal year 2013, the Navy's total direct economic impact to the Hampton Roads region was \$9.1 billion (US Navy, 2015). Based on the role and the presence of the military in the region, previous studies recommend giving priority to transportation projects that improve severe congestion on the roadways serving the military, including I-564, the I-564 and I-64 interchange, and HRBT (HRTPO, 2012a).

#### **1.4.8 Increase Access to Port Facilities**

The Port of Virginia is a hub port. Approximately 30 international shipping lines offer direct service to and from Virginia, with connections to 200 plus countries around the world. Recently, the Port of Virginia in cooperation with the US Army Corps of Engineers (USACE) launched a three-year feasibility study for the deepening of the federal navigation channel that passes through Hampton Roads and the Elizabeth River (Port of Virginia, 2015c). The Port of Virginia is able to serve the largest cargo vessels in the world because of its naturally deep harbor and no overhead restrictions.

**Figure 1-6** shows the state-owned and major privately held ports in the Hampton Roads area. In the Study Area Corridors, the Port of Virginia moves freight through Hampton Roads at the NIT and Newport News Marine Terminal, and leases the Virginia International Gateway (formerly APM) Terminals facility in the City of Portsmouth. It also manages the Port of Richmond and the Virginia Inland Port facility at Front Royal. In addition, a new marine terminal at Craney Island is expected to be operational in the late 2020's/early 2030s (Port of Virginia, 2015b). The Virginia Port Authority also owns the Newport News Marine Terminal that handles break bulk cargo (i.e. individually loaded cargo) and the Portsmouth Marine Terminal. Major privately-held terminals in the region include Lambert's Point Docks and Elizabeth River Terminals.

I-564 terminates at Admiral Taussig Boulevard which continues northwest toward NAVSTA Norfolk and Hampton Boulevard from which northern NIT is accessible. The I-564 Intermodal Connector project will provide NIT direct access to I-564 via this new alignment, which is under construction. Another recent improvement is the Hampton Boulevard Grade Separation project that eliminates conflicts at the at-grade railroad at Hampton Boulevard by going under the railroad.

During Fiscal Year 2015, the majority of containers passing through the port were transported by truck (64 percent), followed in frequency by rail (32 percent) and barge (4 percent) (Port of Virginia, 2015b). Approximately 17,000 freight trucks enter and exit Hampton Roads each weekday (HRTPO, 2014b). In 2015, traffic studies for the HRCS SEIS documented freight traffic comprises three percent of daily traffic at the HRBT and six percent of daily traffic at the MMMBT. HRTPO estimates 10 percent of all regional

truck travel entered or exited the Port of Virginia terminals in the Hampton Roads region (HRTPO, 2015). These freight trucks are not only impacted by regional congestion but contribute to it as well. Roadway congestion on the study corridors adds to the operating costs of companies and shippers, impacting the economic competitiveness of the Port of Virginia and therefore Hampton Roads and the State of Virginia.

Predictably, the majority of truck delay both during the day and at peak travel times occurs on the interstates throughout the region, particularly at bridges and tunnels (HRTPO, 2012b). In 2015, approximately 2,600 trucks crossed between the Peninsula and the Southside daily via the HRBT and 3,700 via the MMMBT. Efficiency of truck travel through the HRBT and MMMBT is particularly hampered by congestion on these routes.

Freight volumes in the region are on a growth trend. Between 2013 and 2014, a 1.2 percent increase in general cargo tons occurred, even though there was an 18 percent drop in coal shipped through the Hampton Roads region (HRTPO, 2015). Even more recently in Fiscal Year 2015, total cargo tonnage in Port of Virginia terminals in the area was up 7.0 percent from 2014 (Port of Virginia, 2015b). The HRTPO states “Hampton Roads has some of the worst congestion in the country, and the majority of containers that pass through the Port of Virginia are transported by truck. These trucks are not only impacted by regional congestion but contribute to it as well. With freight volumes expected to grow significantly, trucks will further contribute to and be impacted by roadway congestion in the future” (HRTPO, 2011b). The percentage of freight in the port moved by rail is growing and it is expected to continue to increase (HRTPO, 2014a). With the regional importance and location of the Port of Virginia, freight rail runs through almost every city in Hampton Roads. Two main freight rail corridors serve the Hampton Roads region, primarily on the Peninsula and the Southside. One corridor originates at the Newport News Marine Terminal and extends northwest up the Peninsula to Richmond. The other consists of feeder rails from the NIT, Portsmouth Marine Terminal, and Virginia International Gateway terminal (among other smaller terminals) leading west, joining either the Norfolk Southern Railroad heading northwest out of the City of Suffolk along US 460 toward the Petersburg/Richmond area, or joining the CSX railroad heading west-southwest out of the City of Suffolk. No rail water crossings over Hampton Roads currently exist.

## **1.5 NEEDS: FUTURE CONDITIONS**

### **1.5.1 Overview**

I-64 and I-664 are critical links in the regional transportation network of the Hampton Roads region. The region has extensive bodies of water that narrow transportation choice. When congestion is severe or incidents occur at the HRBT, traffic diverts to the only two other crossings of the Hampton Roads waterway: the MMMBT or the James River Bridge that are already severely congested at peak travel times.

The I-64, I-664, I-564, and VA 164 Study Area Corridors serve multiple transportation purposes, including commuter, freight movements, military mobility, tourism, and emergency evacuation. However, traffic capacity is inadequate at peak travel times on all these corridors, leading to reduced speeds and long and unpredictable travel times and congestion. These factors impact regional transportation accessibility as described below.

**1.5.2 Accommodate Travel Demand**

The population of Hampton Roads region is expected to increase from 1.7 million in 2010 to 2.04 million by 2040 (HRTPO, 2013b). Between 2015 and 2040, traffic volumes under the No-Build conditions are forecasted to grow as shown in **Table 1-4**. Average weekday daily traffic at the HRBT is expected to increase 26 percent. Similarly, average weekday daily traffic is expected to increase 41 percent at the MMMBT, 60 percent on I-564, and 29 percent on VA 164 in the Study Area Corridors. The purpose of the proposed improvements is to accommodate future travel demand needs in the Study Area Corridors generated, in part, by the large number of military installations, port facilities, major employers, and tourism and recreation opportunities.

**Table 1-4: Future (2040) No-Build Traffic Volumes**

Roadway	Average Weekday Daily Traffic Volume	Eastbound (Southbound) (per peak hour)		Westbound (Northbound) (per peak hour)	
		AM	PM	AM	PM
I-64 (HRBT)	112,200	4,175	4,285	4,250	3,915
I-664 (MMMBT)	90,700	2,960	4,150	4,310	3,530
I-564	71,900	1,050	4,315	4,275	1,415
VA 164	65,600	3,115	2,790	2,350	3,390

**1.5.3 Improve Transit Access**

With the expected increase in population and travel demand, mass transit across Hampton Roads will become even more important in mitigating congestion and travel delay. Existing transit, however, would contend with even more congestion than experienced today. The 2011 Hampton Roads Transit Vision Plan (DRPT et al., 2011) foresees the need for multimodal transit by 2025, and beyond that, provides greater mobility options through an integrated high-capacity transit system. Transit modes needed include light rail, commuter rail, enhanced bus, bus rapid transit, and high speed ferry. The plan recommends that any new harbor or river crossings include dedicated facilities for transit, specifically if improvements to the HRBT or a new “Third Crossing” move forward. The plan states regional transit corridors to connect activity centers throughout the Hampton Roads Region are needed, as are improving transit to underserved areas, and implementing travel demand management strategies to address congestion. Therefore, the purpose of the proposed improvements is to improve transit access throughout the Study Area Corridors by making specific accommodations for transit, and/or by addressing travel demand and improving regional accessibility that benefit all who travel the Study Area Corridors, including transit customers.

**1.5.4 Increase Regional Accessibility**

With existing deficient capacity throughout the Study Area Corridors and no viable detour routes at the HRBT or MMMBT, the ability to consistently maintain traffic flow will become increasingly difficult at these bridge-tunnels and along the Study Area Corridors, based on 2040 forecasted traffic volumes.

Future increases in travel demand and traffic volumes would decrease access to regional and local travel destinations in the Hampton Roads region due to increasing congestion, travel time, and travel unreliability. Exceedance of capacity during peak periods would become progressively worse as illustrated in **Table 1-4**, particularly at the HRBT. Periods of recurring and nonrecurring congestion would become

longer at the HRBT, as would the queues resulting from that congestion. Likewise, average travel speeds would decline further, resulting in longer and less reliable travel times. The ability to provide efficient transit services also would be further diminished.

On southbound I-664 heading toward the MMMBT north portal, increased traffic volumes merging from Terminal Avenue shortly before the tunnel portal would increase congestion. At I-564, the northbound queuing to exit via the Gate 3A interchange would progressively extend congestion toward the I-64 interchange. Port of Virginia truck traffic is growing, but it is anticipated up to half of port freight will be shipped by rail in the foreseeable future (HRTPO, 2015). Additionally, over time, the continued aging of the tunnel, bridge, and road infrastructure on the Study Area Corridors will result in greater maintenance needs, increasing the frequency of periodic congestion. All of the above factors would continue to impair regional accessibility in the Hampton Roads metropolitan area for the foreseeable future. Therefore, the purpose of the proposed improvements is to increase regional accessibility throughout the Study Area Corridors by addressing the identified deficiencies restricting regional access and capacity that cannot accommodate increasing traffic volumes, leading to congestion and unreliable travel.

#### **1.5.5 Address Geometric Deficiencies**

There are no currently programmed comprehensive improvements to alleviate existing geometric deficiencies along I-64 or the substandard tunnel height of the HRBT westbound tunnel in the study limits. The existing bottlenecks caused by reduction in the number of lanes at the HRBT and MMMBT will become progressively worse due to substantially increased future traffic volumes, leading to even more severe congestion. Similarly, the height restriction of the HRBT westbound tunnel will continue to restrict and impede movements of vehicles that are taller than those limits. The substandard dimensions of shoulders along I-64 will continue to contribute to less efficient movement of traffic. While ongoing maintenance will be conducted as needed to preserve the structural integrity of existing facilities, the service life of these facilities cannot be extended indefinitely without more extensive rehabilitation or reconstruction. The I-564 Intermodal Connector currently under construction will provide modern up to date standards for that portion of I-564. Therefore, the purpose of the proposed improvements is to address geometric deficiencies throughout the Study Area Corridors by either bringing them up to current design standards and/or by reducing traffic in areas where geometric deficiencies contribute to congestion.

#### **1.5.6 Enhance Emergency Evacuation Capability**

The population of Hampton Roads is expected to increase from 1.7 million in 2010 to 2.04 million by 2040 (HRTPO, 2013b), an increase of 22 percent, resulting in the potential evacuation of higher volumes of people using designated evacuation routes during hurricanes and other emergency events. As described in the 2014 in-season hurricane preparedness review for Hampton Roads, future road networks should include considerations for improving the capacity and options for evacuating citizens from the region (Virginia Department of Emergency Management (VDEM), 2014). If the transportation network capacity does not accommodate the growth in population, the timely and efficient evacuation of the population will continue to be hampered. Therefore, the purpose of the proposed improvements is to enhance emergency evacuation capability throughout the Study Area Corridors by addressing deficiencies with the existing evacuation routes and/or by providing additional evacuation options.



### **1.5.7 Improve Strategic Military Connectivity**

With growing traffic volumes that exceed capacity, future military mobility and connectivity will increasingly decline in the Study Area Corridors. This will substantially decrease access for commuters who work at regional military installations. It will slow military travel between installations, and impact the efficient and timely movement of cargo and personnel during military operations, including at PND ports in the Hampton Roads area. Future needs include providing adequate capacity and reduced travel time and increased reliability for STRAHNET Study Area Corridors. Therefore, the purpose of the proposed improvements is to improve strategic military connectivity in the Study Area Corridors by improving access to NAVSTA Norfolk, NIT and VIG, and by reducing congestion that improves overall regional accessibility.

### **1.5.8 Increase Access to Port Facilities**

By 2040, trucks are expected to remain the primary mode of freight transportation in the region (HRTPO, 2014c). According to the FHWA Freight Analysis Framework, the overall tonnage of domestic goods that will be moved into, within, and out of Hampton Roads by truck is expected to increase 65 percent between 2010 and 2040 (HRTPO, 2013c). HRTPO forecasts that weekday 24-hour truck volume will increase approximately 12 percent (to 3,668 trucks) at the HRBT, 14 percent (4,939) at the MMMBT, and 82 percent (4,540) on VA 164 by 2030 (HRTPO, 2014c). With freight volumes expected to substantially grow and most port freight is shipped by trucks, roadway congestion from port traffic will increase in the foreseeable future (HRTPO, 2011b; 2015a). One key factor in making the decision of which mode to ship is the reliability of Hampton Roads crossings (HRTPO, 2011b). However, as mention in Section 1.4.8, the proportion of freight shipped by rail is anticipated to increase in the future.

As the majority of cargo freight is moved via trucks, forecasted increases in traffic volumes with attendant increases in travel times and decreasing travel reliability on the Study Area Corridors would decrease the efficient movement of goods and impede commerce in Hampton Roads. The Port of Virginia has been positioning itself to be the dominant east coast port when the Panama Canal expansion (Panamax) is operational, likely in 2016. The Panamax project would double the capacity of the Panama Canal by 2016 and allow larger vessels through the canal. The Port of Virginia is currently the only east coast port that is fully ready for the Panamax expansion because it has the appropriate channel depths for the deeper draft container ships and state-of-the art marine terminals (Port of Virginia, 2013).

The transportation network will need to address increased truck traffic from the Port of Virginia expansion while addressing congestion and the need to improve travel time and reliability. Moreover, the unrestricted vessel air draft (i.e., no overhead obstructions) and cargo ship access to harbor anchorages would need to continue in the future. Therefore, the purpose of the proposed improvements is to increase access to area port facilities by improving regional accessibility through congestion reduction on Study Area Corridors and/or providing improved linkage to interstates for NIT and VIG.

## **1.6 PURPOSE AND NEED SUMMARY**

The purpose of the HRCS is to relieve congestion at the I-64 HRBT in a manner that improves accessibility, transit, emergency evacuation, and military and goods movement along the primary transportation corridors in the Hampton Roads region, including the I-64, I-664, I-564, and VA 164 corridors. The HRCS will address the following needs (in the order of presentation in the Purpose and Need section):

- Accommodate travel demand – capacity is inadequate on the Study Area Corridors, contributing to congestion at the HRBT;
- Improve transit access – the lack of transit access across the Hampton Roads waterway;
- Increase regional accessibility – limited number of water crossings, inadequate highway capacity, and severe congestion decrease accessibility;
- Address geometric deficiencies – insufficient vertical and horizontal clearance at the HRBT contribute to congestion;
- Enhance emergency evacuation capability – increase capacity for emergency evacuation, particularly at the HRBT;
- Improve strategic military connectivity – congestion impedes military movement missions; and,
- Increase access to port facilities – inadequate access to interstate highway travel in the Study Area Corridors impacts regional commerce.