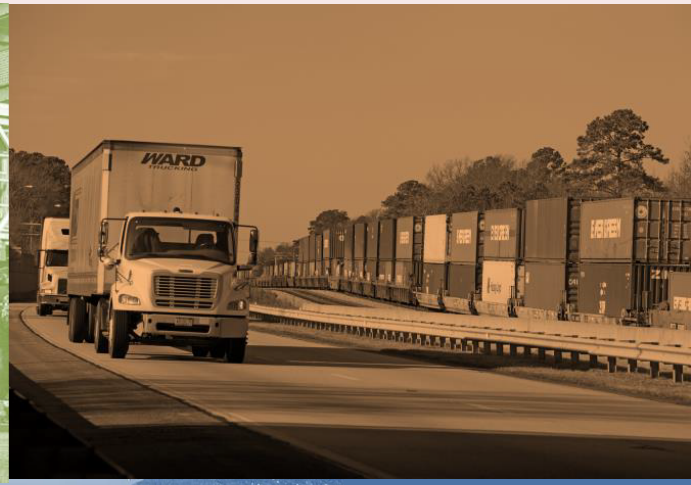
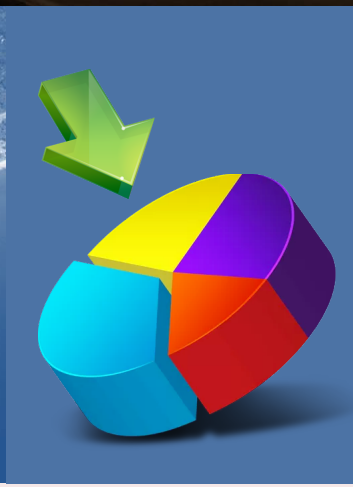
REGIONAL PERFORMANCE MEASURES SYSTEM PERFORMANCE REPORT 2019





the *heartbeat* of HAMPTON ROADS TPO

TRANSPORTATION PLANNING ORGANIZATION

APRIL 2019

T19-03

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REGIONAL PERFORMANCE MEASURES

SYSTEM PERFORMANCE REPORT

2019

PREPARED BY:

the heartbeat of HAMPTON ROADS TPO
TRANSPORTATION PLANNING ORGANIZATION

APRIL 2019

T19-03

REPORT DOCUMENTATION

TITLE
Regional Performance Measures – System Performance Report 2019

AUTHOR/PROJECT MANAGER
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ABSTRACT
The Moving Ahead for Progress in the 21st Century (MAP-21) surface transportation legislation established a performance-and outcome-based program. As part of this program, MAP-21 and the current Fixing America's Surface Transportation (FAST) Act legislation require that States and Metropolitan Planning Organizations (MPOs) prepare and use a set of federally-established performance measures that are tied to the national performance goals. Each MPO must set regional targets in the areas of roadway safety, Transit Asset Management, pavement condition, bridge condition, roadway performance, and freight.

Setting the initial HRTPO targets was a collaborative effort. The Transportation Technical Advisory Committee (TTAC) recommended targets for the HRTPO Board to consider. In order to assist the TTAC, the committee formed a Performance Measure Working Group. This Working Group included staff from localities, transit agencies, VDOT, and subject-matter experts.

This Regional Performance Measures – System Performance Report will be updated on an annual basis to reflect updated targets as well as progress towards meeting the established targets.

REPORT DATE
April 2019

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Prepared in cooperation with the U.S. Department of Transportation (USDOT), Federal Highway Administration (FHWA), and Virginia Department of Transportation (VDOT). The contents of this report reflect the views of the Hampton Roads Transportation Planning Organization (HRTPO). The HRTPO is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the FHWA, VDOT or Hampton Roads Planning District Commission. This report does not constitute a standard, specification, or regulation. FHWA or VDOT acceptance of this report as evidence of fulfillment of the objectives of this planning study does not constitute endorsement/approval of the need for any recommended improvements nor does it constitute approval of their location and design or a commitment to fund any such improvements. Additional project level environmental impact assessments and/or studies of alternatives may be necessary.

NON-DISCRIMINATION

TABLE OF CONTENTS

INTRODUCTION

The Moving Ahead for Progress in the 21st Century (MAP-21) surface transportation legislation established a performance- and outcome-based program. The Federal Highway Administration (FHWA) defines performance-based planning and programming as a system-level, data-driven process to identify strategies and investments.

A key feature of MAP-21 (and continued under the current Fixing America's Surface Transportation [FAST] Act legislation) is the establishment of national performance goals in the following areas:

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

As part of this program, MAP-21 and the FAST Act require that States and Metropolitan Planning Organizations (MPOs) prepare and use a set of federally-established performance measures that are tied to the national performance goals, as described below.

MEASURES

States and MPOs must prepare and set targets for the federally-established performance measures in the following table:

Area	Measures
Safety	Fatalities
	Fatality Rate
	Serious Injuries
	Serious Injury Rate
	Bike/Pedestrian Fatalities & Serious Injuries
Transit	Transit Asset Management
Bridge Condition	NHS bridge deck area in good condition
	NHS bridge deck area in poor condition
Pavement Condition	Interstate System pavement in good condition
	Interstate System pavement in poor condition
	Non-Interstate NHS pavement in good condition
	Non-Interstate NHS pavement in poor condition
Roadway Performance	Interstate Travel Time Reliability
	Non-Interstate NHS Travel Time Reliability
Freight	Truck Travel Time Reliability Index
CMAQ	N/A for Attainment areas (Hampton Roads is currently classified as an Attainment/Maintenance area for Ozone.)

INTRODUCTION

TARGET SETTING PROCESS

Each MPO must set targets for each of the measures shown on the previous page. These performance measures and targets must be reported based on the MPO's Metropolitan Planning Area (MPA). The Hampton Roads MPA (shown to the right) is comprised of 15 localities including all of Chesapeake, Hampton, Isle of Wight County, James City County, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, Williamsburg, and York County and portions of Franklin, Gloucester County, and Southampton County.

For target setting, the MPO may:

- Adopt the statewide targets, but report metrics specific to the MPA
- Select unique, MPO specific targets, and report metrics specific to the MPA
- Use a combination of statewide and unique targets

Each MPO must establish its targets within 180 days of the date that the state established its targets. The initial MPO roadway safety targets needed to be established by February 27, 2018. Targets in Transit Asset Management were due by October 1, 2018. The remaining initial targets (bridge condition, pavement condition, roadway performance, and freight) needed to be established by each MPO by November 14, 2018.

HAMPTON ROADS METROPOLITAN PLANNING AREA

For roadway safety and Transit Asset Management, targets are established for a one-year time horizon and must be set on an annual basis. For bridge condition, pavement condition, roadway performance and freight measures, MPO targets are established for a four-year time horizon, whereas states must establish both two-year and four-year targets. States may adjust these four-year targets at the midway point (after two years). If the state makes an adjustment and the MPO adopted the statewide targets, the MPO has the option to adopt the adjusted statewide target or to commit to a new, unique MPO-specific target within 180 days.

If an MPO establishes its own unique four-year targets, the MPO may adjust its target in a manner that is collectively developed, documented, and mutually agreed upon by the State DOT and MPO. This is allowable regardless of whether the state adjusted its four-year target or not.

There are no "penalties" for MPOs for not meeting their performance targets, although it can be addressed during the quadrennial certification review to ensure adequate performance-based planning efforts.

Setting the initial HRTPO targets was a collaborative effort. The Transportation Technical Advisory Committee (TTAC) recommended targets for the HRTPO Board to consider. In order to assist the TTAC, the committee formed a Performance Measure Working Group. This Working Group included staff from localities, transit agencies, VDOT, and subject-matter experts.

The HRTPO Board established initial roadway safety targets on February 15, 2018 and Transit Asset Management targets on August 29, 2018. The remaining initial targets were established by the HRTPO Board on October 18, 2018.

While statewide targets are reported to the Federal Highway Administration (FHWA), targets established by MPOs are reported to the state. HRTPO reported transit targets to the Virginia Department of Rail and Public Transportation (DRPT) and the remaining targets to the Virginia Department of Transportation (VDOT).

INCORPORATING TARGETS INTO THE PLANNING PROCESS

MAP-21 and the FAST Act also require that MPOs include these performance measures and targets and report on progress in planning documents such as the Long-Rang Transportation Plan (LRTP) and Transportation Improvement Program (TIP).

The LRTP is a comprehensive and multimodal transportation blueprint that identifies and plans for critically important transportation improvements that not only meet the transportation goals of the HRTPO but also impact the region's economic vitality and every citizen's quality of life. The LRTP – which must encompass a minimum of a 20-year time horizon – contains a list of transportation projects that are expected to be constructed based on the anticipated funding available during the time horizon. In Hampton Roads the current LRTP horizon year is 2040, and planning for the 2045 Long-Range Transportation Plan is underway.

The LRTP is required to include a description of the federally required performance measures and targets used in assessing the performance of the transportation system. The LRTP shall also include a system performance report evaluating the condition and performance of the transportation system including progress achieved by the MPO towards meeting the performance targets. It is envisioned that this annual System Performance Report will meet this requirement. Also, MPOs that elect to conduct scenario planning (as HRTPO has for the upcoming 2045 LRTP) shall describe how the preferred scenario will improve performance of the system.

INTRODUCTION

Transportation Improvement Programs are federally-mandated, regional documents that identify the programming of transportation funds over a four-year period. It lists all projects for which federal funds are anticipated, along with non-federally funded projects that are determined to be regionally significant. For performance measures and targets, TIPs shall include a description of the anticipated effect of the TIP toward achieving the performance targets identified by the MPO. The TIP must also link investment priorities to the achievement of performance targets in the plans.

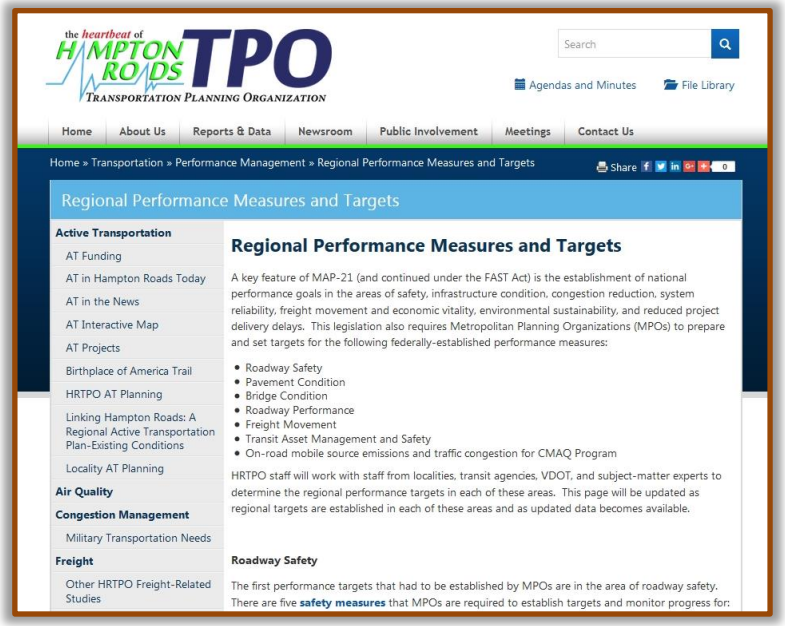
TIPs and LRTPs must include this information when any updates or amendments are made two years from the effective date of each rule establishing performance measures. For safety measures, this information had to be included in the TIP and LRTP for all updates and amendments after May 27, 2018. For Transit Asset Management measures the inclusion date was October 1, 2018, and for the remaining measures the inclusion date is May 20, 2019.

The HRTPO TIP was updated to include information on the program's impact on roadway safety in May 2018 and on Transit Asset Management in October 2018. The LRTP was updated via an administrative modification for the roadway safety measures in May 2018 and Transit Asset Management in October 2018. Both the TIP and LRTP will be updated to account for the remaining measures in 2019.

In addition, the metropolitan transportation planning agreement between the MPO, the State, and regional public transportation providers (commonly referred to as the 3-C agreement) was updated to include an article on Performance-Based Metropolitan Planning Process responsibilities. The updated agreement – which details each party's responsibilities in terms of performance-based planning – is available at **https://www.hrtpo.org/page/ metropolitan-planning-agreement**.

WEBSITE

In addition to this document, the HRTPO also maintains a Regional Performance Measures and Targets website. This site includes information on each of these performance measures as well as the basis for selecting each regional target. Progress toward meeting targets will also be detailed on the site. The HRTPO Regional Performance Measures and Targets website is **https://www.hrtpo.org/page/regional-performance-measures-and-targets**.



ROADWAY SAFETY

MEASURES

- **Number of Fatalities**
- **Fatality Rate**
- **Number of Serious Injuries**
- **Serious Injury Rate**
- **Number of Non-Motorized Fatalities & Serious Injuries Combined**

METHODOLOGY

This measure examines the safety of the regional roadway system in terms of the total number and rate of fatalities and serious injuries. In addition, bicyclist and pedestrian (non-motorized) fatalities and serious injuries are analyzed. These measures and targets help support the Highway Safety Improvement Program (HSIP) and cover all public roadways regardless of ownership or functional classification.

The number of fatalities throughout the Metropolitan Planning Area (MPA) must be determined on an annual basis using data from USDOT's Fatality Analysis Reporting System (FARS) database. The FARS database contains a description and more than 100 coded data elements of each reported fatal crash throughout the country. A crash must involve a motor vehicle traveling on a roadway that is generally open to the public and must result in the death of a person (either an occupant of a vehicle or a non-motorist) within 30 days of the crash to be included in the FARS database.

In order to determine the annual number of serious injuries within the MPA, data collected and prepared by VDOT is used. Serious injuries are generally defined as incapacitating injuries that can include skull fractures, internal injuries, broken or distorted limbs, unconsciousness, severe lacerations, severe burns, and other injuries that render the person unable to leave the scene without assistance. Law enforcement frequently uses the "KABCO" scale for classifying injuries, and serious injuries are defined as the "A" on this KABCO scale.

In addition to the total number of fatalities and serious injuries in each region, MPOs must measure and establish targets in the rate of fatalities and serious injuries. This rate is based on the number of fatalities and serious injuries that occurred per 100 million vehicle-miles of travel.

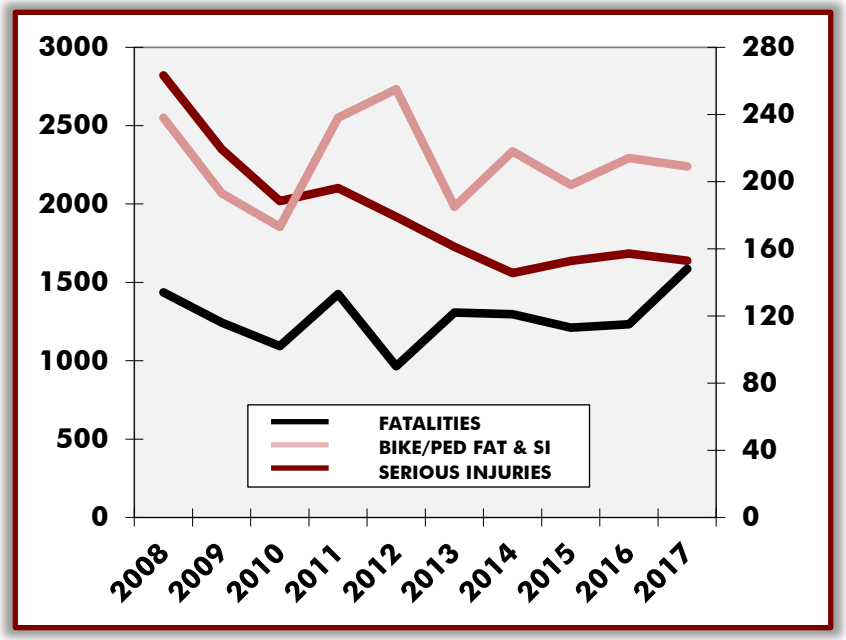
Finally, there is a fifth roadway safety measure related to the safety of non-motorists. MPOs must measure and set targets for the annual number of bicyclist and pedestrian fatalities and serious injuries within the MPA. This combined number is produced using FARS data for non-motorized fatalities and VDOT data for non-motorized serious injuries. The number should include all pedestrians, bicyclists, other cyclists, and persons on personal conveyances killed or seriously injured throughout the region in the calendar year.

ROADWAY SAFETY

CURRENT/HISTORICAL CONDITIONS

The following chart shows the number of fatalities, serious injuries, and bike and pedestrian crashes and serious injuries combined in Hampton Roads between 2008 and 2017. This was the data that was used to assist with determining the 2019 targets.

FATALITIES, SERIOUS INJURIES, AND BIKE/ PEDESTRIAN FATALITIES & SERIOUS INJURIES IN HAMPTON ROADS (2008-2017)



STATEWIDE 2019 TARGETS

▶ Number of Fatalities	840
▶ Fatality Rate per 100M VMT	0.94
▶ Number of Serious Injuries	7,689
▶ Serious Injury Rate per 100M VMT	8.75
▶ Number of Combined Bicyclist & Pedestrian Fatalities & Serious Injuries	714

The statewide 2018 safety targets established by the Commonwealth Transportation board (CTB) were based on the targets included in the Virginia 2017-2021 Strategic Highway Safety Plan. These targets included a 2% annual decrease in fatalities, 5% decrease in serious injuries, and a 4% decrease in the number of bicyclist and pedestrian fatalities and serious injuries combined.

A different methodology was used to determine the 2019 statewide targets. Rather than using percent reduction targets, the state based their 2019 targets on annual trend lines. The state did this to account for the reality that the number of fatalities throughout Virginia is increasing and the number of serious injuries is no longer decreasing.

ROADWAY SAFETY

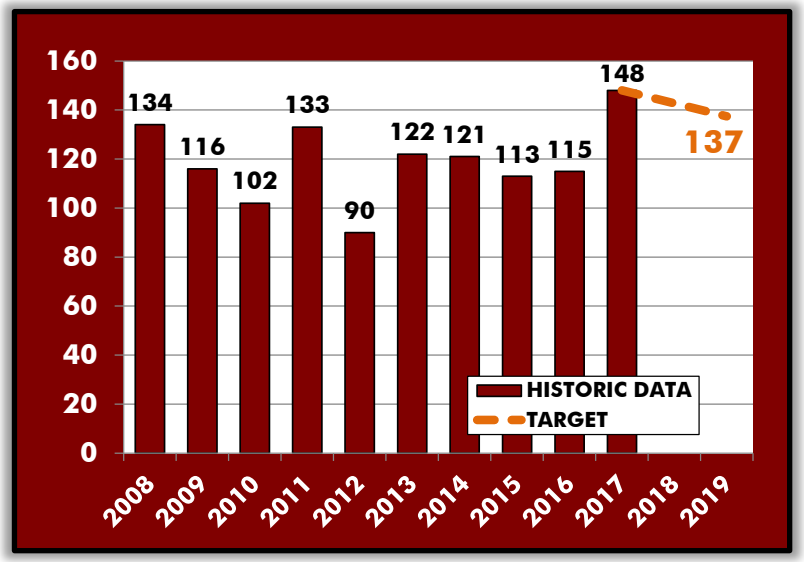
HRTPO 2019 TARGETS

The HRTPO established one-year (2019) targets for the number of fatalities (137), fatality rate (0.93 fatalities per 100 million vehicle-miles of travel), number of serious injuries (1,522), serious injury rate (10.32 serious injuries per 100 million VMT), and the number of non-motorized fatalities and serious injuries combined (194).

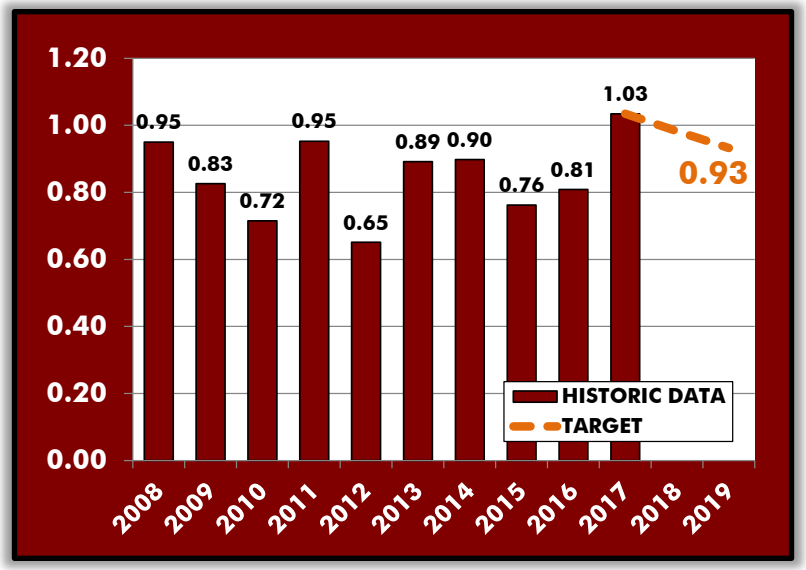
Each of these safety targets is based on the Vision Zero concept, where the number of fatalities, serious injuries, and non-motorized fatalities and serious injuries is reduced by a set amount each year to reach a goal of zero by 2045, the horizon of the upcoming regional Long-Range Transportation Plan. An anticipated increase in vehicle-miles of travel of 1.5% annually was assumed for the fatality and serious injury rates, which is equal to the rate assumed in statewide targets. More information on the Vision Zero concept is available at **https://visionzeronetwork.org**.

▶ Number of Fatalities	137
▶ Fatality Rate (per 100 MVMT)	0.93
▶ Number of Serious Injuries	1,522
▶ Serious Injury Rate (per 100 MVMT)	10.32
▶ Number of Non-Motorized Fatalities and Serious Injuries Combined	194

NUMBER OF FATALITIES

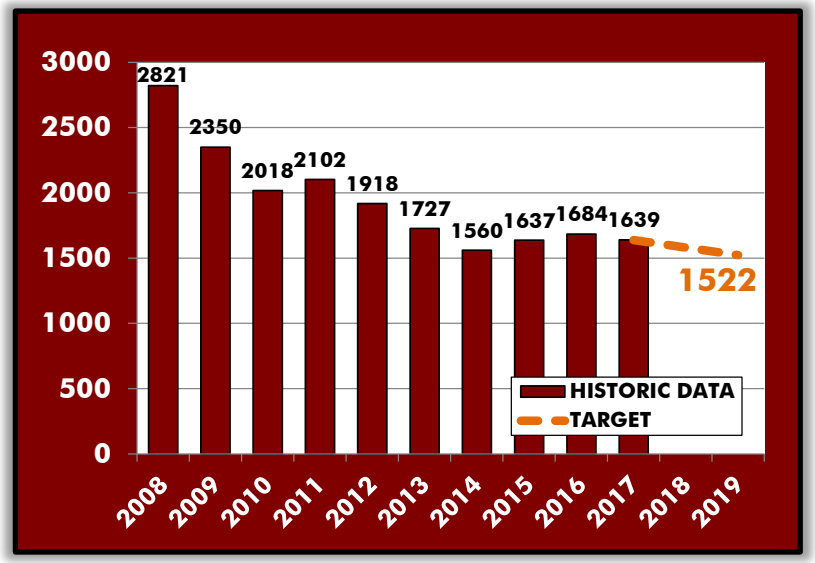


FATALITY RATE (PER 100 MILLION VMT)

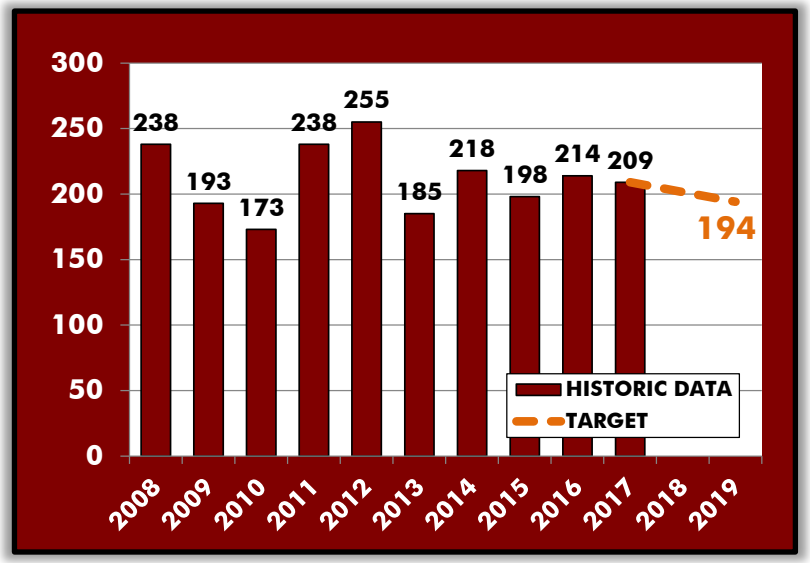


ROADWAY SAFETY

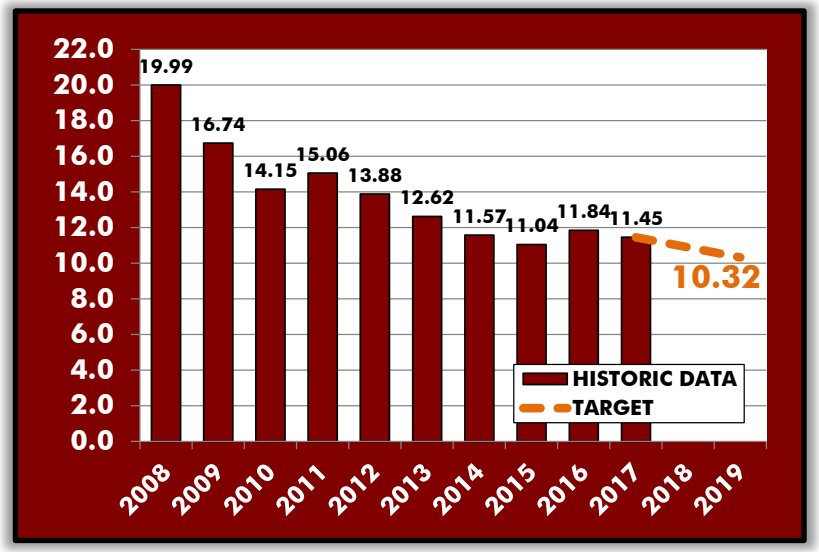
NUMBER OF SERIOUS INJURIES



NUMBER OF NON-MOTORIZED FATALITIES AND SERIOUS INJURIES COMBINED



SERIOUS INJURY RATE (PER 100M VMT)



BRIDGE CONDITION

MEASURES

- **Percentage of National Highway System (NHS) Bridge Deck Area in Good Condition**
- **Percentage of National Highway System (NHS) Bridge Deck Area in Poor Condition**

METHODOLOGY

This measure examines the condition of bridges on the National Highway System (NHS) – including on- and off-ramps connected to the NHS – on a regional basis. In order to be included, the bridge must meet National Bridge Inventory (NBI) standards. These standards include:

- The structure must be located on roadways open to the general public. Bridges located within the security perimeter of military bases and other secure federal facilities are not included.
- The bridge must carry a roadway. Structures that carry only railroad or pedestrian traffic are not included.
- The bridge must be more than 20 feet in length. Culverts are included, as long as the opening in the culvert is more than 20 feet in length.

Bridges are inspected on a regular basis. During these inspections, bridge inspectors rate the condition of the bridge's deck (the driving surface), superstructure (the structural members such as beams and girders), and substructure (the piers, abutments, piles, footings, and other components of the bridge's foundation).

Each of these three components is rated by the bridge inspector from 0 to 9, with 9 representing a component in excellent condition and 0 representing a failed condition or a closed bridge. For culverts, a single rating is given in place of the deck, superstructure, and substructure ratings to assess the general condition of the entire culvert.

Bridges are classified as being in good, fair, or poor condition based on **the lowest** of the condition ratings of the bridge's deck, superstructure, and substructure. For culverts, the classification is based on the culvert condition rating. These classification thresholds are shown in the table below.

Condition Rating Thresholds for Classification

	NBI Rating Scale (from 0 – 9)	9 8 7 Good	6 5 Fair	4 3 2 1 0 Poor
Bridge	Deck (Item 58)	≥7	5 or 6	≤4
Bridge	Superstructure (Item 59)	≥ 7	5 or 6	≤ 4
Bridge	Substructure (Item 60)	≥ 7	5 or 6	≤ 4
	Culvert (Item 62)	≥ 7	5 or 6	≤ 4

BRIDGE CONDITION

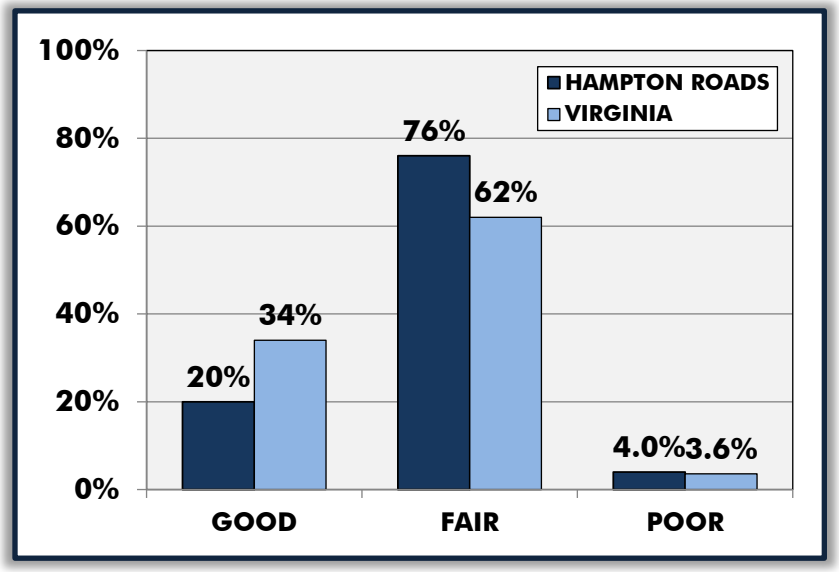
For example, if a structure has a deck condition rated as a 7, a superstructure condition rated as a 4, and a substructure condition rated as a 5, then the structure is classified as being in poor condition based on the lowest condition rating of 4.

After each NBI bridge on the NHS is classified as being in good, fair, or poor condition, the deck area of each bridge is calculated by multiplying the full width of the bridge by the bridge's length. The total deck area of each good bridge, fair bridge, and poor bridge throughout the region is summed together, and then divided by the total deck area of all NBI bridges on the NHS in the entire region. This produces a total regional percentage of bridges that are in good condition, fair condition, and poor condition. The regional percentages of NBI bridge deck area in good and poor condition on the NHS are tracked for regional targets.

CURRENT/HISTORICAL CONDITIONS

The following chart shows the percentage of NHS Bridge Deck Area in Good, Fair, and Poor condition in Hampton Roads and throughout Virginia as of 2017:

PERCENTAGE OF NHS BRIDGE DECK AREA IN HAMPTON ROADS AND VIRGINIA BY CONDITION (2017)



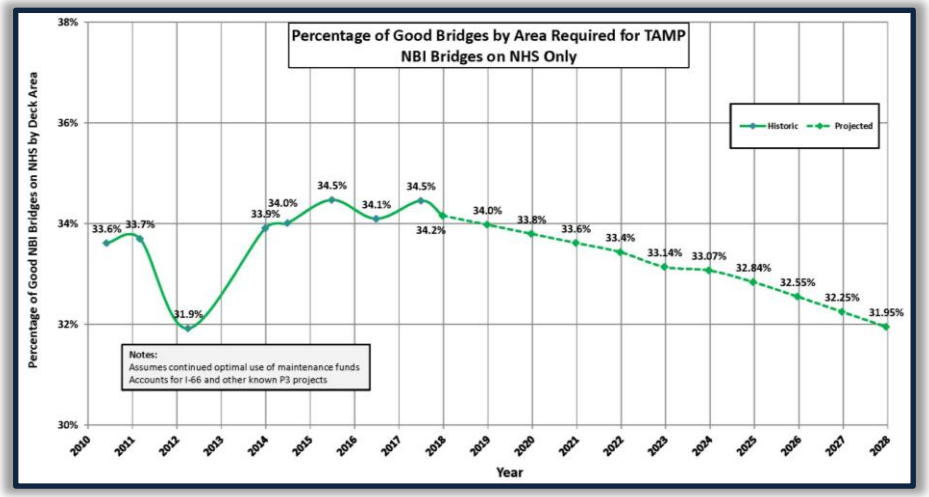
BRIDGE CONDITION

STATEWIDE 4-YEAR TARGETS (2018-2021)

- **Percentage of NHS Bridge Deck Area in Good Condition** **> 33%**
- **Percentage of NHS Bridge Deck Area in Poor Condition** **< 3%**

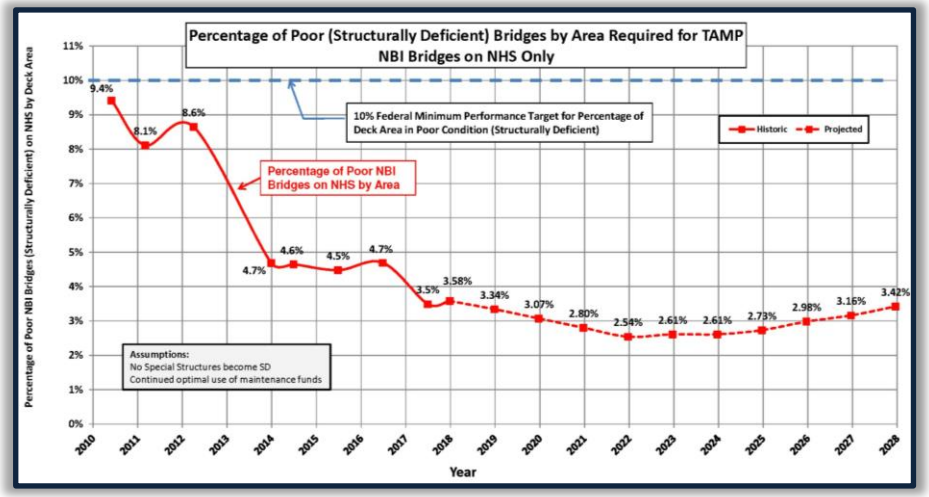
The statewide four-year targets established by the Commonwealth Transportation Board (CTB) are based on VDOT projections of bridge conditions assuming continued optimal use of maintenance funds. These statewide projections produced by VDOT are shown in the figures to the right.

STATEWIDE PROJECTED PERCENTAGE OF BRIDGES IN GOOD CONDITION



Source: VDOT

STATEWIDE PROJECTED PERCENTAGE OF BRIDGES IN POOR CONDITION



Source: VDOT

BRIDGE CONDITION

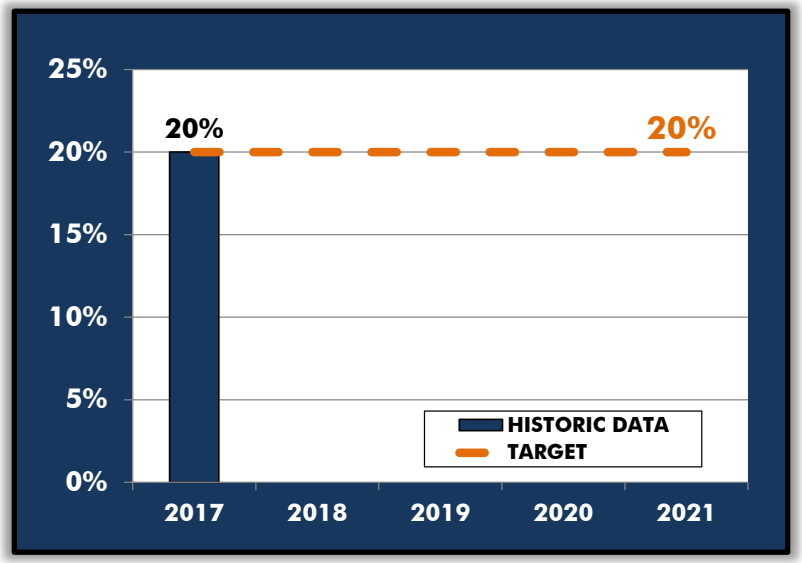
HRTPO 4-YEAR TARGETS (2018-2021)

The HRTPO established four-year targets of greater than 20% of NHS Bridge Deck Area being in Good Condition, and less than 3% of NHS Bridge Deck Area being in Poor Condition.

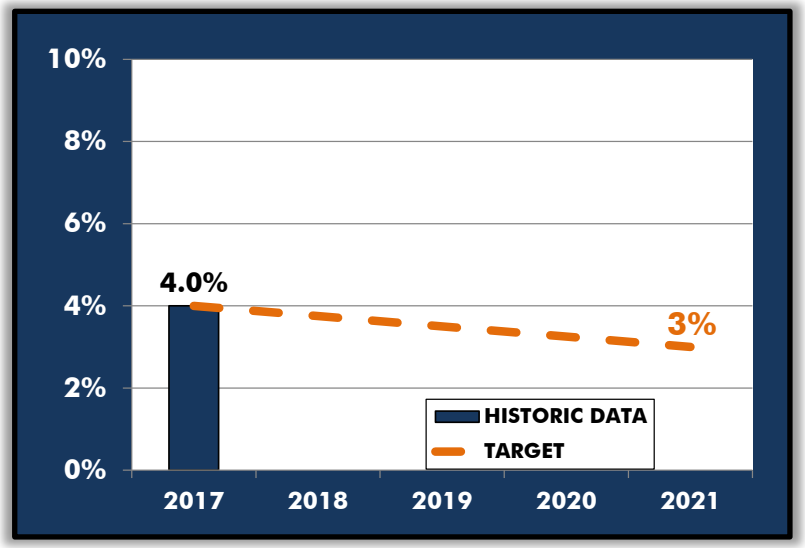
The percentage of NHS bridge deck area in poor condition matches the statewide target established by the CTB. However, the regional target that was established for NHS bridge deck area in good condition is based on maintaining the current percentage of bridges in Hampton Roads that are classified in good condition. This target was chosen because the current statewide percentage of NHS bridge deck area in good condition (34%) is much higher than the percentage in Hampton Roads (20%), and the state target for bridges in good condition (33%) is similar to the current percentage.

- **Percentage of NHS Bridge Deck Area in Good Condition** **> 20%**
- **Percentage of NHS Bridge Deck Area in Poor Condition** **< 3%**

PERCENTAGE OF NHS BRIDGE DECK AREA IN HAMPTON ROADS IN GOOD CONDITION



PERCENTAGE OF NHS BRIDGE DECK AREA IN HAMPTON ROADS IN POOR CONDITION



PAVEMENT CONDITION

MEASURES

- **Percentage of Interstate System pavement in Good Condition**
- **Percentage of Interstate System pavement in Poor Condition**
- **Percentage of Non-Interstate NHS pavement in Good Condition**
- **Percentage of Non-Interstate NHS pavement in Poor Condition**

METHODOLOGY

This measure examines the condition of roadway pavement on the National Highway System (NHS). The percentage of the region's Interstate system pavement in good and poor condition is measured as is the percentage of the region's Non-Interstate NHS pavement. This measure only includes through travel lanes; ramps, shoulders, turn lanes, crossovers, etc. are not included in this analysis.

Pavement condition data is collected annually by VDOT on every mile of the NHS throughout the state, regardless of roadway ownership. In the Hampton Roads Metropolitan Planning Area (MPA), there are nearly 500 miles (and nearly 2,300 lane-miles) of roadway included on the NHS. Information on VDOT's pavement data collection process is available at **http://www.virginiadot.org/info/state_of_the_pavement.asp**.

The following metrics are used in determining the pavement condition of each NHS roadway:

- International Roughness Index (IRI) – IRI is used to determine the ride quality based on the smoothness of pavement. It is measured in inches per mile of roadway.
- Rutting and Faulting – Rutting is a surface depression in the wheel path of asphalt roadways, and faulting is the difference in elevation across joints or cracks in jointed concrete.
- Cracking – Cracking measures the percentage of roadway surface area where cracks are present.
- Present Serviceability Rating (PSR) – If the posted speed limit is less than 40 mph, the PSR can be used in place of the metrics above to determine the condition of the pavement.

Each of these aspects of each NHS roadway segment's pavement is rated as good, fair, or poor. These ratings are assigned based on the table below.

	Good	Fair	Poor
IRI (inches/mile)	<95	95-170	>170
Rutting (inches)	<0.20	0.20-0.40	>0.40
Faulting (inches)	<0.10	0.10-0.15	>0.15
Cracking (%)	<5	5-20 (asphalt) 5-15 (JCP) 5-10 (CRCP)	>20 (asphalt) >15 (JCP) >10 (CRCP)
PSR	PSR ≥ 4.0	2.0 ≤ PSR ≤ 4.0	PSR ≤ 2.0

PAVEMENT CONDITION

For roadways with a posted speed limit below 40 mph, the PSR can be used for determining the overall condition of the pavement. Otherwise, the overall condition of each section of NHS roadway is determined based on the pavement type and the appropriate metrics described previously. As shown in the figure to the right, for a section to be in good condition, all of the appropriate metrics must be rated as good. Roadway sections are determined to be in poor condition if two of the three metrics (IRI, cracking, and rutting/faulting) are rated poor for asphalt and jointed concrete, or both metrics (IRI and cracking) are rated poor for continuous concrete.

On a statewide level, no more than 5% of the Interstate system can be in poor condition. If this minimum threshold is not met, the state is required to obligate a specified percentage of its National Highway Performance Program (NHPP) and Surface Transportation Program (STP) funds to improve Interstate pavement condition. There is no similar penalty for the Non-Interstate NHS.

	Pavement Type			
	Asphalt and Jointed Concrete	Continuous Concrete		
Overall Section Condition Rating	3 metric ratings (IRI, cracking and rutting/faulting)	2 metric ratings (IRI and cracking)		Measures
Good	All three metrics rated "Good"	Both metrics rated "Good"	→	percentage of lane-miles in "Good" condition
Poor	≥ 2 metrics rated "Poor"	Both metrics rated "Poor"	→	percentage of lane-miles in "Poor" condition
Fair	All other combinations	All other combinations		

PAVEMENT CONDITION

CURRENT/HISTORICAL CONDITIONS

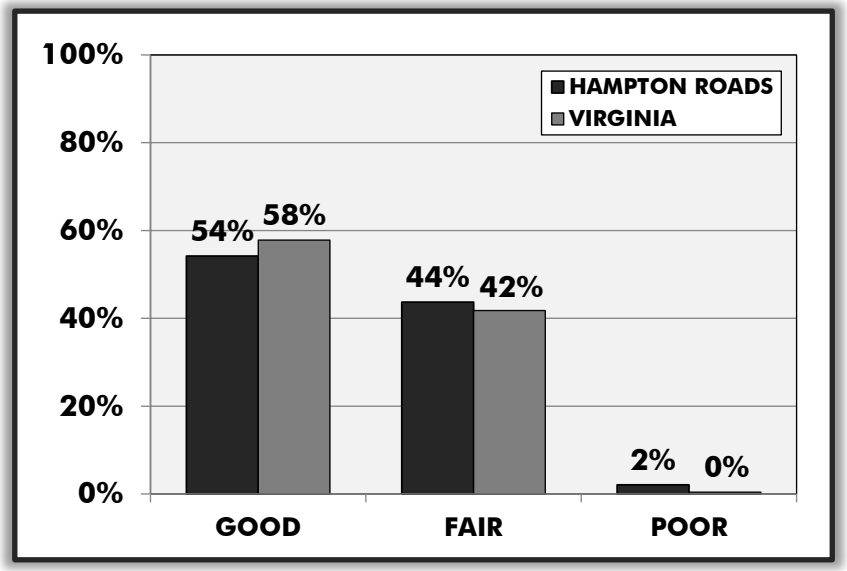
The following charts show the percentage of Interstate System and Non-Interstate NHS pavement in Good, Fair, and Poor condition in Hampton Roads and throughout Virginia as of 2017.

STATEWIDE 4-YEAR TARGETS (2018-2021)

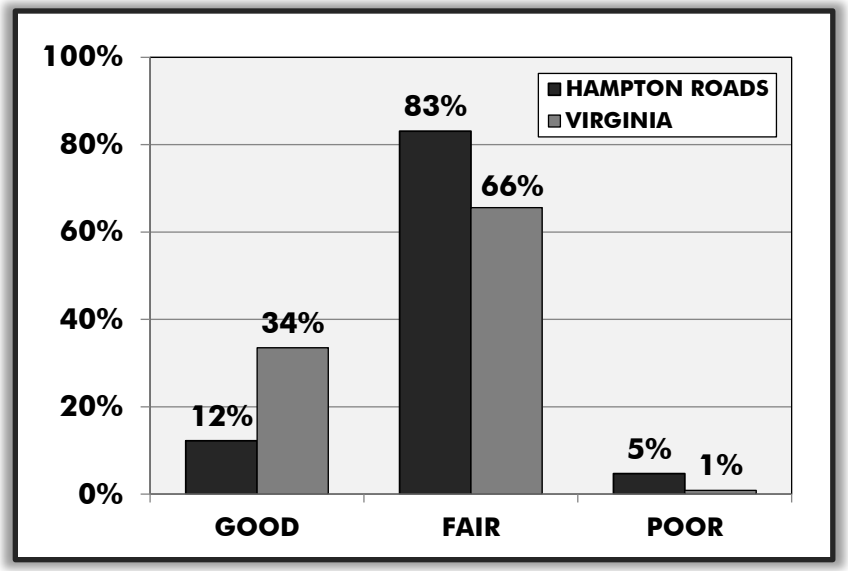
- **Percentage of Interstate System Pavement in Good Condition** **> 45%**
- **Percentage of Interstate System Pavement in Poor Condition** **< 3%**
- **Percentage of Non-Interstate NHS Pavement in Good Condition** **> 25%**
- **Percentage of Non-Interstate NHS Pavement in Poor Condition** **< 5%**

The statewide four-year targets established by the Commonwealth Transportation Board (CTB) are based on VDOT projections of pavement conditions assuming optimal use of maintenance funds.

PERCENTAGE OF PAVEMENT IN HAMPTON ROADS AND VIRGINIA BY CONDITION INTERSTATE (2017)



PERCENTAGE OF PAVEMENT IN HAMPTON ROADS AND VIRGINIA BY CONDITION NON-INTERSTATE NHS (2017)



PAVEMENT CONDITION

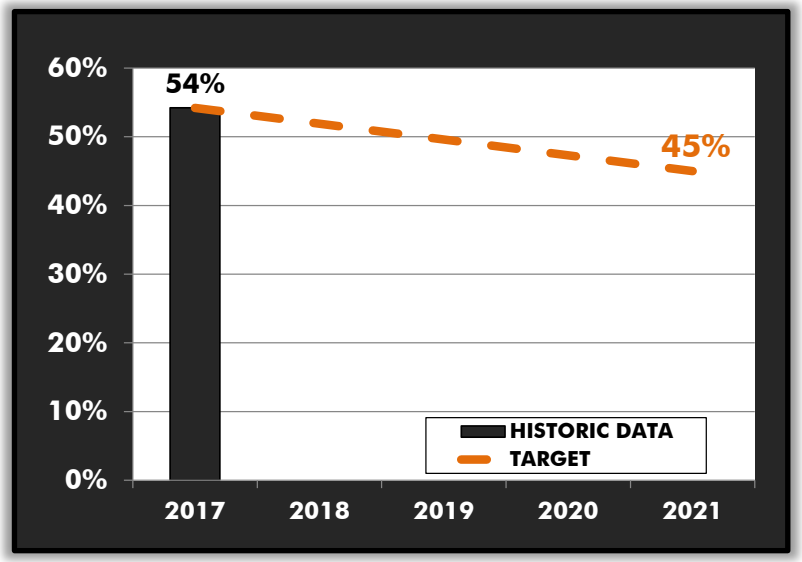
HRTPO 4-YEAR TARGETS (2018-2021)

The HRTPO established four-year targets of greater than 45% of Interstate pavement condition being in Good Condition, less than 3% of Interstate pavement condition being in Poor Condition, greater than 25% of Non-Interstate NHS pavement condition being in Good Condition, and less than 5% of Non-Interstate NHS pavement condition being in Poor Condition. **All of these percentages match the statewide targets established by the CTB.**

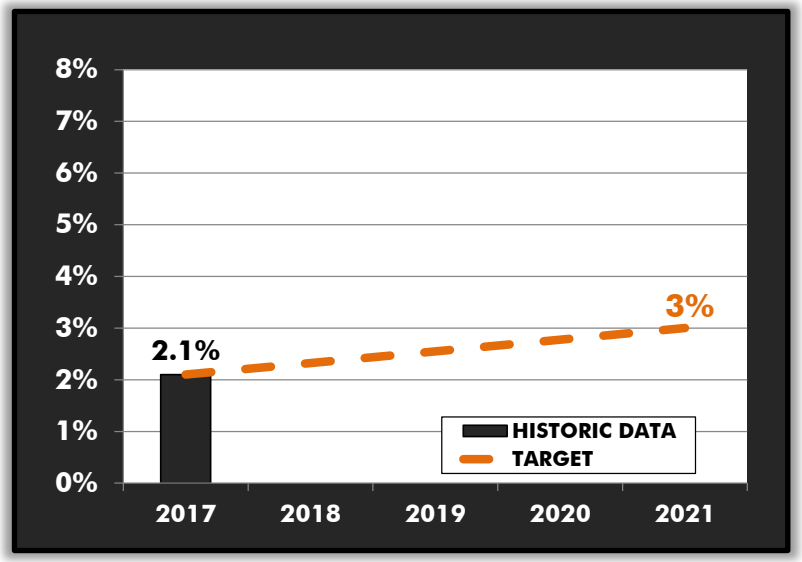
HRTPO chose to match the regional Interstate targets with the statewide targets since the existing condition of Interstate pavement in Hampton Roads is similar to the statewide condition. Similar to the statewide Interstate targets, the regional targets are based on an expectation that the amount of Interstate pavement in good condition will decrease. For Non-Interstate NHS, the statewide targets were also chosen in spite of a much lower percentage of Non-Interstate NHS pavement in Good condition in Hampton Roads than the statewide percentage.

- **Percentage of Interstate System pavement in Good Condition** **> 45%**
- **Percentage of Interstate System pavement in Poor Condition** **< 3%**
- **Percentage of Non-Interstate NHS pavement in Good Condition** **> 25%**
- **Percentage of Non-Interstate NHS pavement in Poor Condition** **< 5%**

PERCENTAGE OF PAVEMENT IN HAMPTON ROADS IN GOOD CONDITION - INTERSTATE

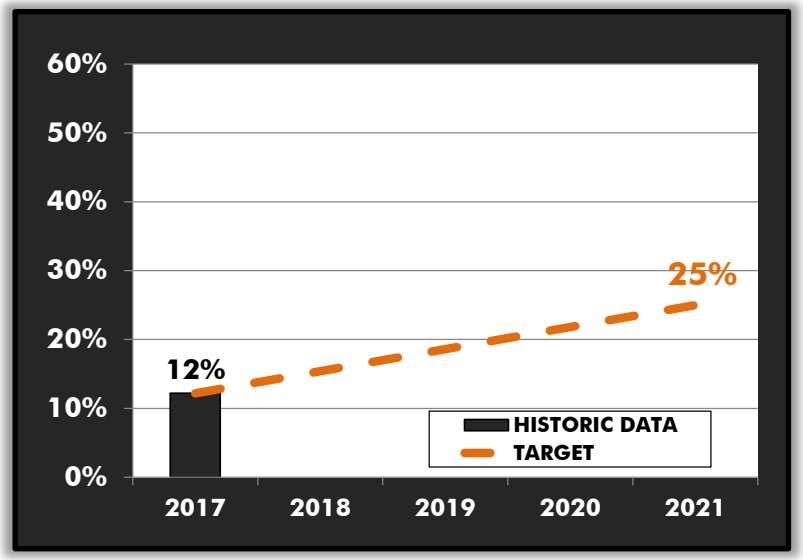


PERCENTAGE OF PAVEMENT IN HAMPTON ROADS IN POOR CONDITION - INTERSTATE

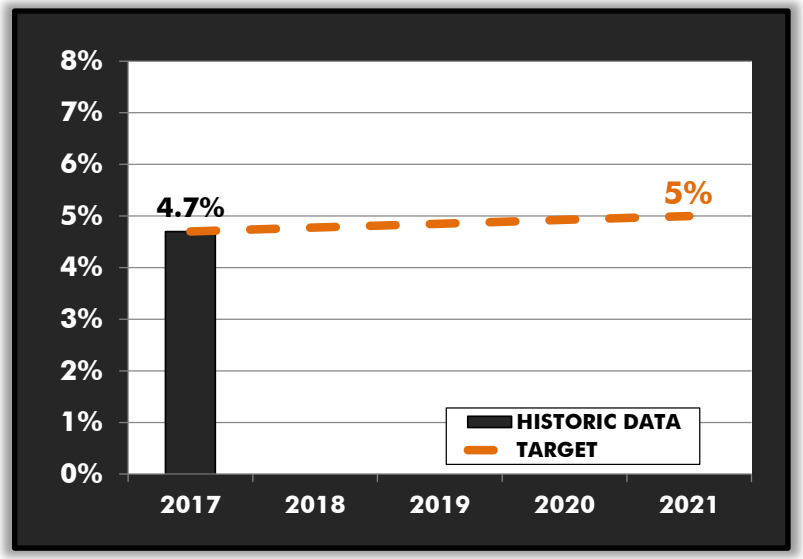


PAVEMENT CONDITION

PERCENTAGE OF PAVEMENT IN HAMPTON ROADS IN GOOD CONDITION - NON-INTERSTATE NHS



PERCENTAGE OF PAVEMENT IN HAMPTON ROADS IN POOR CONDITION - NON-INTERSTATE NHS



TRANSIT ASSET MANAGEMENT

MEASURES

- **Transit Asset Management (TAM) – Rolling Stock**
- **TAM – Equipment/Service Vehicles**
- **TAM - Infrastructure**
- **TAM - Facilities**

METHODOLOGY

This measure examines the condition of various aspects of the regional public transportation system. The Federal Transit Administration's (FTA) Performance-Based Planning final rule requires transit performance measures in the area of state of good repair, also referred to as Transit Asset Management (TAM). There are four TAM asset categories that MPOs are required to establish regional targets and monitor progress for:

- Rolling Stock – Buses, ferry boats, light rail vehicles, trolley buses, and vans
- Equipment/Service Vehicles – Non-revenue automobiles, trucks, and other rubber tire vehicles
- Infrastructure – Light rail
- Facilities – Facilities for passengers, parking, maintenance, and administrative purposes

MPOs are required to establish regional targets and monitor progress for each of the assets using the following performance measures:

Asset Type	Performance Measure	Asset Classes
Rolling Stock	% of revenue vehicles within each asset class that have met or exceeded their useful life benchmark (ULB)	Buses, ferry boats, light rail vehicles, trolley buses, vans
Equipment/ Service Vehicles	% of vehicles that have met or exceeded their useful life benchmark (ULB)	Non-revenue automobiles, trucks, other rubber tire vehicles
Infrastructure	% of track segments, signals, and systems with performance restrictions	Light rail infrastructure
Facilities	% of facilities in each asset class rated under 3.0 on FTA's TERM scale	Passenger facilities, parking facilities, maintenance facilities, administrative facilities

Three transit agencies operate within the Hampton Roads Metropolitan Planning Area – Hampton Roads Transit (HRT), the Williamsburg Area Transit Authority (WATA), and Suffolk Transit. HRT, as a larger Tier I transit agency, must develop and carry out their own TAM plans. As Tier II transit agencies, WATA and Suffolk Transit are eligible to participate in group TAM plans. WATA and Suffolk Transit elected to use the statewide targets that were established by the Virginia Department of Rail and Public Transportation (DRPT) for Tier II agencies.

TRANSIT ASSET MANAGEMENT

CURRENT/HISTORICAL CONDITIONS

The following table shows the current Transit Asset Management conditions in Hampton Roads as of Fiscal Year 2018:

Rolling Stock	
% of revenue vehicles within each asset class that have met or exceeded their useful life benchmark	
Buses	36.7%
Cutaway Buses	0%
Ferry Boat	50.0%
Light Rail Vehicles	0%
Minibus	28.6%
Trolley Buses	4.8%
Vans	40.0%

Equipment/Service Vehicles	
% of vehicles that have met or exceeded their useful life benchmark	
Non-Revenue/Service Vehicles	91.3%
Trucks & Other Rubber Tire Vehicles	64.0%

Infrastructure	
% of track segments, signals, and systems with performance restrictions	
Light Rail Infrastructure	2.8%

Facilities	
% of facilities in each asset class rated under 3.0 on FTA's TERM scale	
Passenger/Parking	9.1%
Maintenance	10.0%
Administrative	10.0%

STATEWIDE 2019 TARGETS

The Virginia Department of Rail and Public Transportation established targets for Tier II transit agencies – such as WATA and Suffolk Transit – that elected to participate in the statewide group TAM plan. These FY 2019 targets are:

Rolling Stock

(% of revenue vehicles that have met or exceeded their useful life benchmark)

- Buses < 10%
- Cutaways Buses < 10%
- Minibus < 20%
- Trolley Buses < 10%
- Vans < 25%

Equipment/Service Vehicles

(% of vehicles that have met or exceeded their useful life benchmark)

- Non-Revenue/Service Vehicles < 25%
- Trucks & Other Rubber Tire Vehs < 25%

Facilities

(% of facilities in each asset class rated under 3.0 on FTA's TERM scale)

- Passenger < 10%
- Maintenance < 10%
- Administrative < 10%

There are no statewide targets for Tier I transit agencies such as HRT. Each Tier I transit agency must establish their own Transit Asset Management targets.

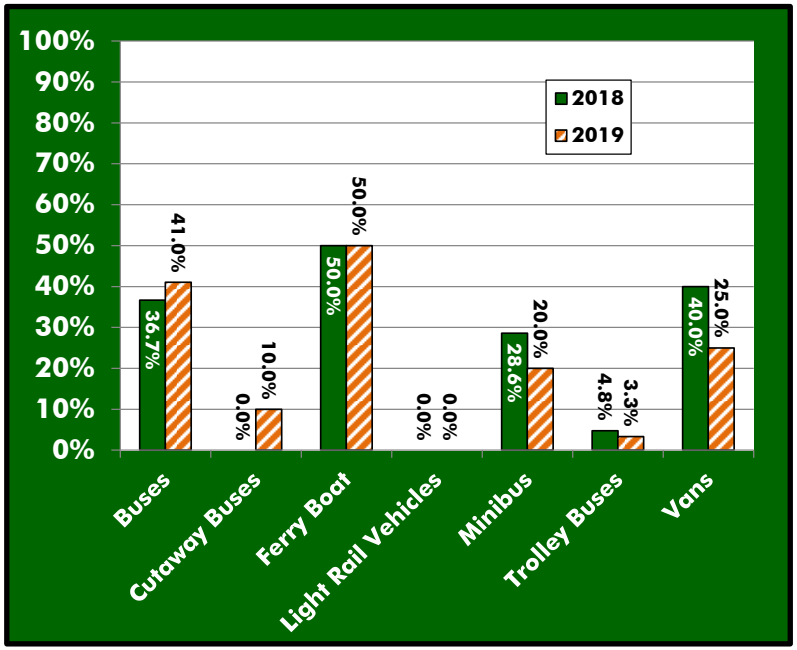
TRANSIT ASSET MANAGEMENT

HRTPO 2019 TARGETS

The HRTPO established one-year (2019) regional Transit Asset Management targets for each of the categories shown to the right. **These regional targets are based on a weighted average of HRT, WATA, and Suffolk Transit Fiscal Year 2019 targets.**

ROLLING STOCK

PERCENTAGE OF REVENUE VEHICLES THAT HAVE MET OR EXCEEDED THEIR USEFUL LIFE BENCHMARK



Rolling Stock
% of revenue vehicles that have met or exceeded their useful life benchmark

- Buses < 41%
- Cutaway Buses < 10%
- Ferry Boat < 50%
- Light Rail Vehicles 0%
- Minibus < 20%
- Trolley Buses < 3%
- Vans < 25%

Equipment/Service Vehicles
% of vehicles that have met or exceeded their useful life benchmark

- Non-Revenue/Service Vehicles < 92%
- Trucks & Other Rubber Tire Vehicles < 70%

Infrastructure
% of track segments, signals, and systems with performance restrictions

- Light Rail Infrastructure < 3%

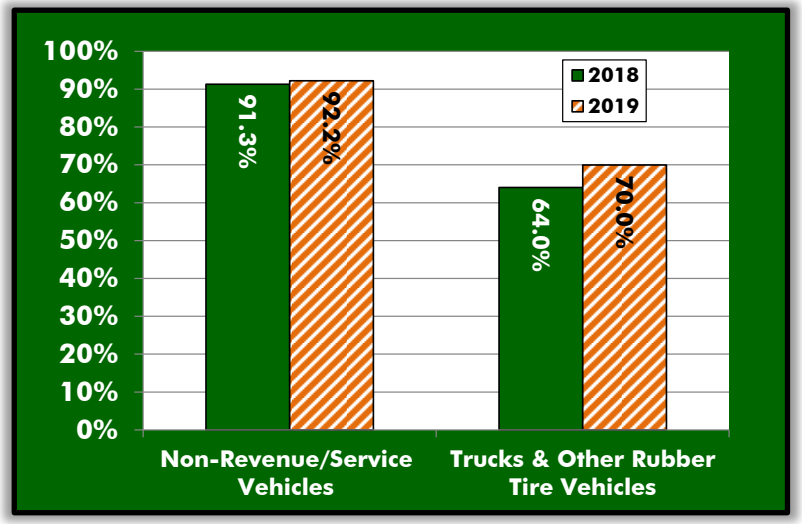
Facilities
% of facilities in each asset class rated under 3.0 on FTA's TERM scale

- Passenger/Parking < 1%
- Maintenance < 10%
- Administrative < 10%

TRANSIT ASSET MANAGEMENT

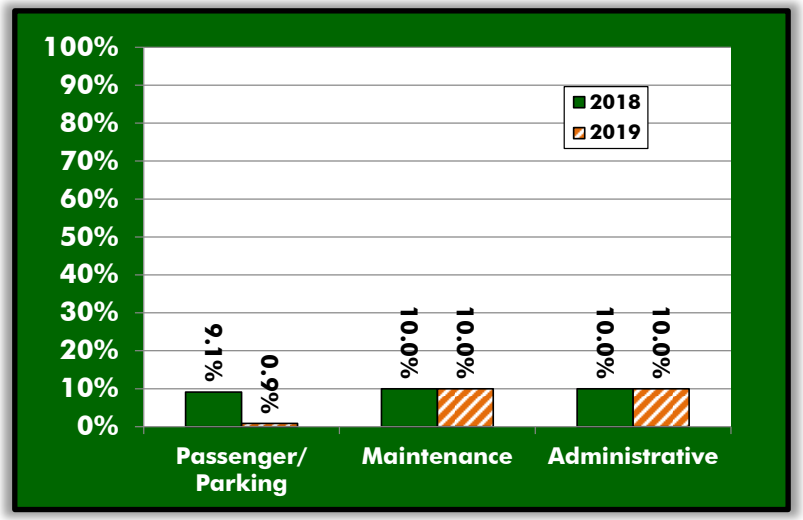
EQUIPMENT/SERVICE VEHICLES

PERCENTAGE OF VEHICLES THAT HAVE MET OR EXCEEDED THEIR USEFUL LIFE BENCHMARK



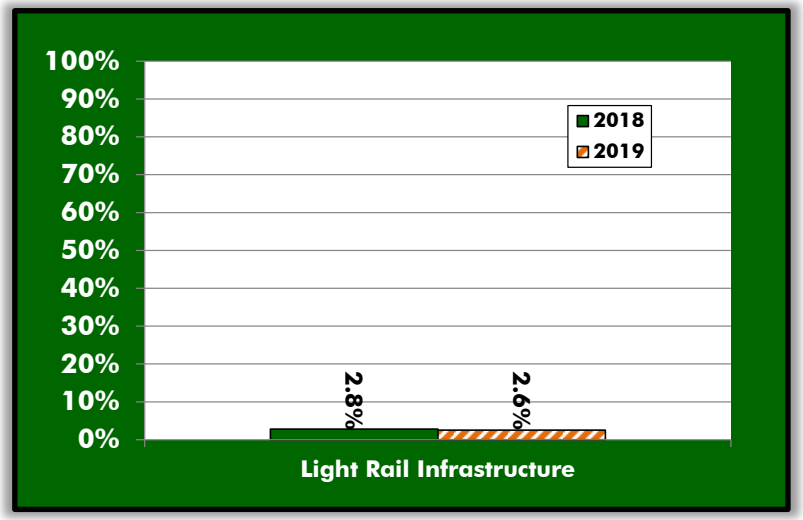
FACILITIES

PERCENTAGE OF FACILITIES IN EACH ASSET CLASS RATED UNDER 3.0 ON FTA'S TERM SCALE



INFRASTRUCTURE

PERCENTAGE OF TRACK SEGMENTS, SIGNALS, AND SYSTEMS WITH PERFORMANCE RESTRICTIONS



ROADWAY PERFORMANCE

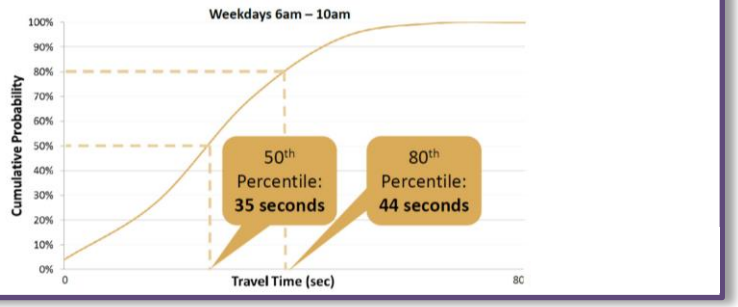
MEASURES

- **Interstate Travel Time Reliability (% reliable person-miles of travel)**
- **Non-Interstate National Highway System Travel Time Reliability (% reliable person-miles of travel)**

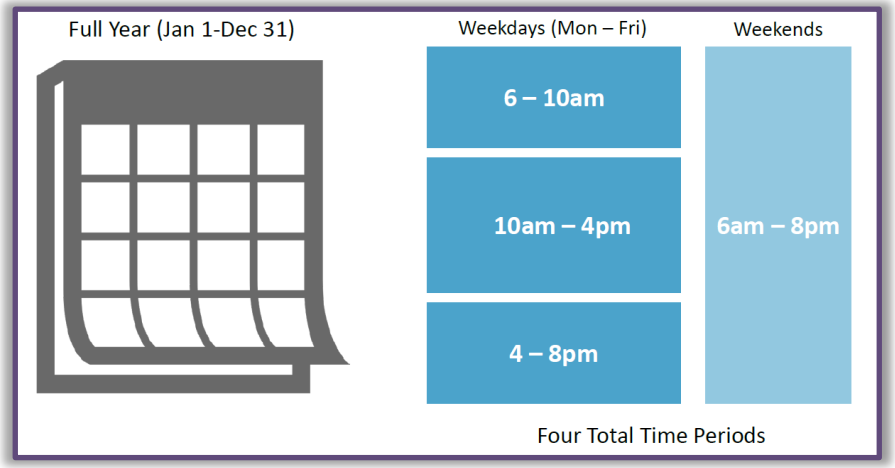
METHODOLOGY

This measure examines the roadway performance of the National Highway System (NHS) based on the person-miles travelled that are classified as reliable. The reliability of the system is calculated using a new metric referred to as the Level of Travel Time Reliability (LOTTR). The LOTTR is defined as the ratio of the 80th percentile travel time to the mean (50th percentile) travel time. Travel time information – which is provided through the National Performance Management Research Data Set (NPMRDS) – is collected throughout the year on each segment of the NHS in 15-minute intervals. An example of this calculation is shown below:

$$Level\ of\ Travel\ Time\ Reliability = \frac{80th\ percentile\ travel\ time}{50th\ percentile\ travel\ time\ (\text{“}normal\ travel\ time\text{”})}$$



Travel times throughout the year are divided into four reporting periods: Weekday morning peak, weekday midday, weekday afternoon peak, and weekends. The time of day that each period represents is shown below:

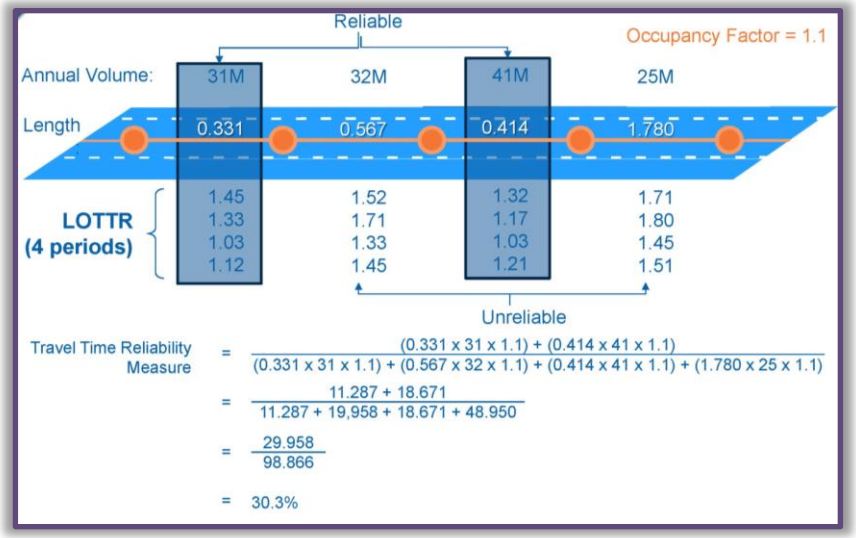


A LOTTR ratio is calculated for each Interstate segment and Non-Interstate NHS segment by direction for each of these time periods over the course of an entire year. This produces a total of four LOTTR ratios for each Interstate and Non-Interstate NHS segment. Segments are considered to be not reliable if any of these four LOTTR ratios are 1.50 or greater. For a segment to be classified as reliable, all four LOTTR ratios must be below 1.50. An example of this calculation is shown on the next page:

ROADWAY PERFORMANCE

$$\frac{\text{Longer Travel Time (80th)}}{\text{Normal Travel Time (50th)}} = \frac{\text{\# seconds}}{\text{\# seconds}} = \text{Level of Travel Time Reliability Ratio}$$

Level of Travel Time Reliability (LOTTR) *(Single Segment, Interstate Highway System)*		
Monday – Friday	6am – 10am	LOTTR = $\frac{44 \text{ sec}}{35 \text{ sec}}$ = 1.26
	10am – 4pm	LOTTR = 1.39
	4pm – 8pm	LOTTR = 1.54
Weekends	6am – 8pm	LOTTR = 1.31
Must exhibit LOTTR below 1.50 during **all** of the time periods		Segment is not reliable



Each Interstate and Non-Interstate NHS segment in the region follows this procedure to determine whether the segment is reliable or not reliable. Each of the reliable individual Interstate and Non-Interstate NHS segments are then multiplied by the length of that particular segment, the annual vehicle volume on that segment, and an occupancy factor based on the average number of persons per vehicle that converts vehicular travel to person travel. These products are added together for the entire Interstate and Non-Interstate NHS network and divided by the same factors for the entire system to produce the regional percentage of reliable person-miles of travel on the Interstate and Non-Interstate NHS systems. An example of this calculation is shown to the right:

ROADWAY PERFORMANCE

CURRENT/HISTORICAL CONDITIONS

The following charts show the percentage of reliable person-miles of travel in Hampton Roads and throughout Virginia for 2016 and 2017. The chart on the left reflects the data for the Interstate system, and the chart on the right reflects the Non-Interstate NHS.

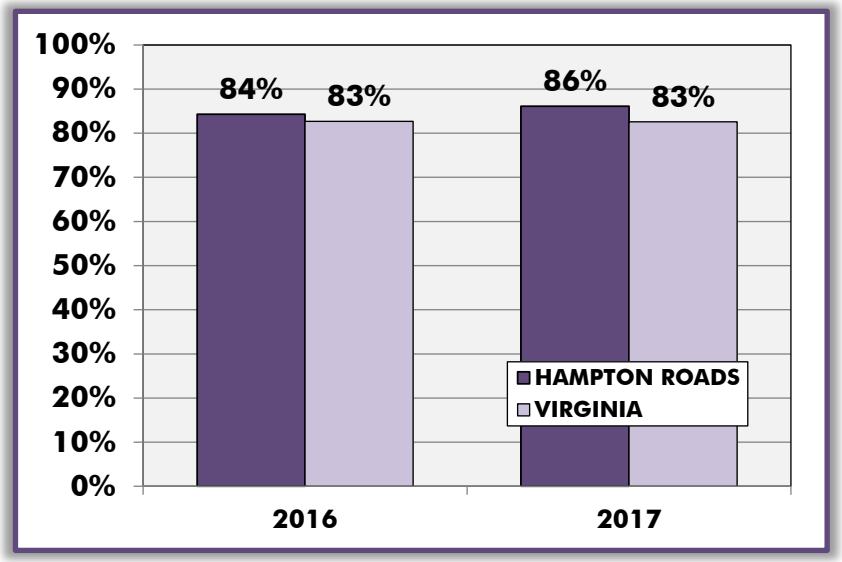
In addition, the maps on the following page show roadways in Hampton Roads that were classified as reliable and not reliable using the LOTTR in 2017.

STATEWIDE 4-YEAR TARGETS (2018-2021)

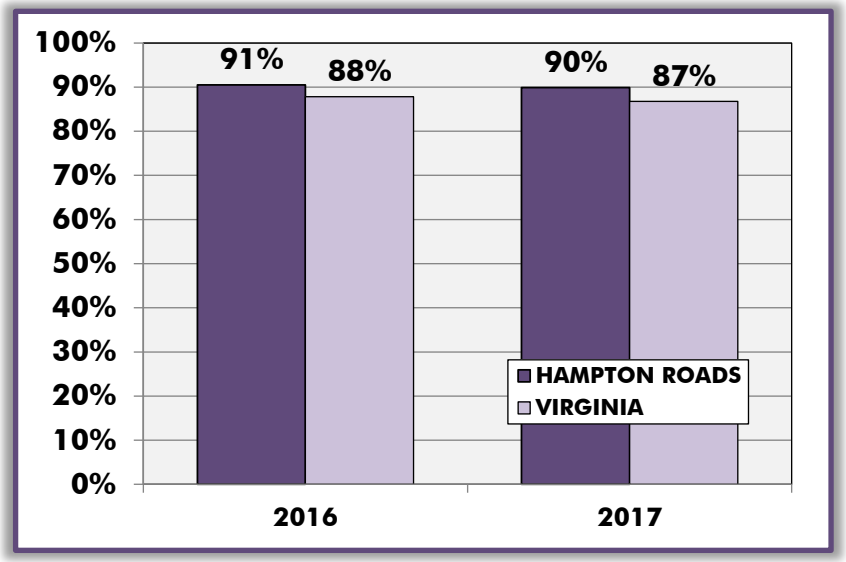
- **Percentage of Reliable Person-Miles of Travel - Interstate > 82%**
- **Percentage of Reliable Person-Miles of Travel – Non-Interstate NHS > 82.5%**

The statewide four-year targets established by the Commonwealth Transportation Board (CTB) are based on VDOT projections using an extrapolation of the statewide travel time reliability data from 2016 to 2017.

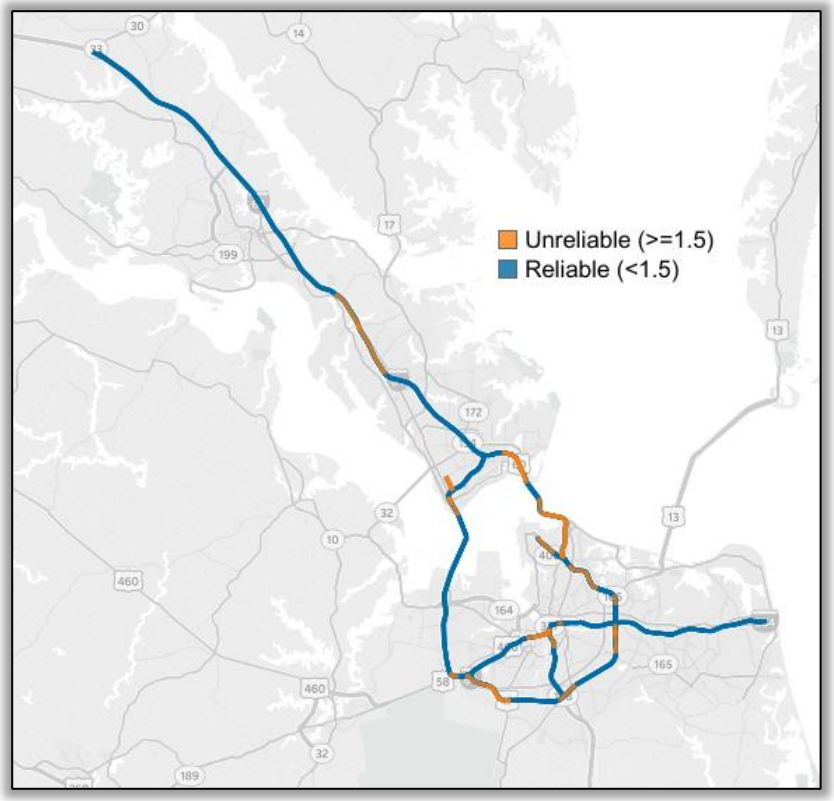
PERCENTAGE OF RELIABILE PERSON-MILES OF TRAVEL - INTERSTATE (2016 & 2017)



PERCENTAGE OF RELIABILE PERSON-MILES OF TRAVEL – NON-INTERSTATE NHS (2016 & 2017)

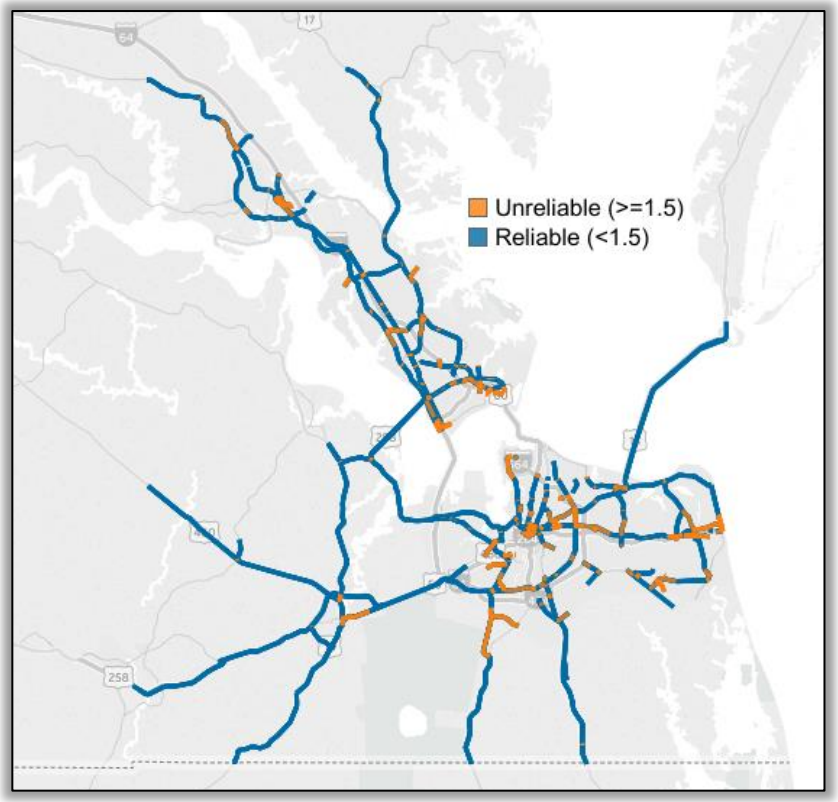


PERCENTAGE OF RELIABILE PERSON-MILES OF TRAVEL - INTERSTATE (2017)



Source: VDOT

PERCENTAGE OF RELIABILE PERSON-MILES OF TRAVEL – NON-INTERSTATE NHS (2017)



Source: VDOT

ROADWAY PERFORMANCE

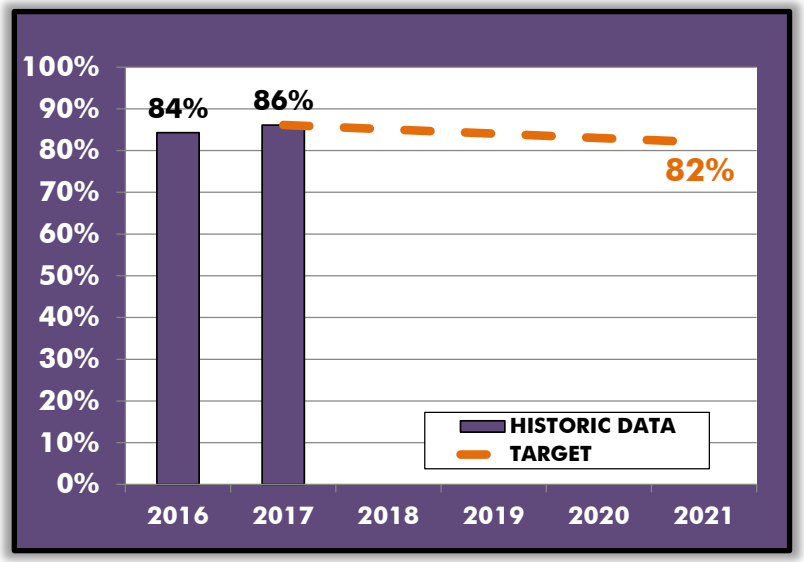
HRTPO 4-YEAR TARGETS (2018-2021)

The HRTPO established four-year targets of greater than 82% of the Interstate travel in the region being reliable, and greater than 82.5% of the Non-Interstate NHS travel being reliable. **Both of these percentages match the statewide targets established by the CTB.**

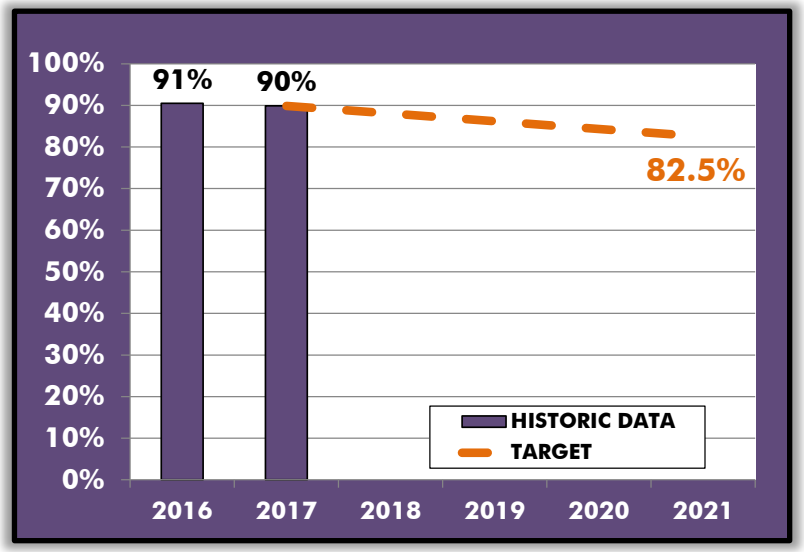
This target was chosen largely because there will be many changes to the Hampton Roads roadway network over the next few years. Major widening projects will be occurring at the Hampton Roads Bridge-Tunnel, High Rise Bridge, I-64 near Williamsburg, and at the I-64/I-264 interchange in Norfolk and Virginia Beach. While some phases of these projects will be complete by 2021, many of these projects will still be underway, leading to additional unreliable travel through the work zones. This uncertainty led to approving regional targets that matched statewide targets rather than trying to determine unique regional targets.

- **Interstate Travel Time Reliability (% reliable person-miles)** **> 82%**
- **Non-Interstate NHS Travel Time Reliability (% reliable person-miles)** **> 82.5%**

PERCENTAGE OF RELIABILE PERSON-MILES OF TRAVEL - INTERSTATE



PERCENTAGE OF RELIABILE PERSON-MILES OF TRAVEL - NON-INTERSTATE NHS



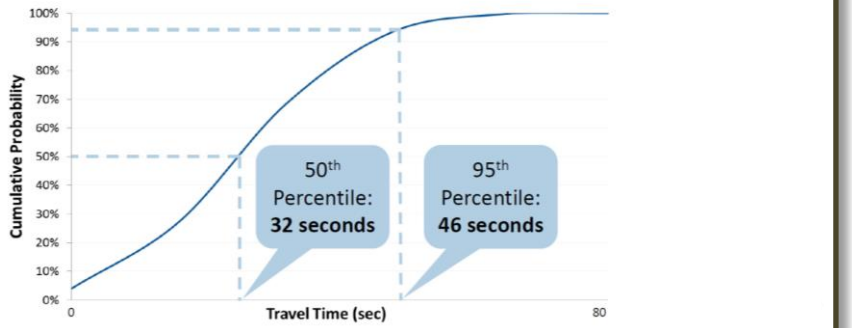
MEASURES

- **Truck Travel Time Reliability (TTTR) Index on the Interstate system**

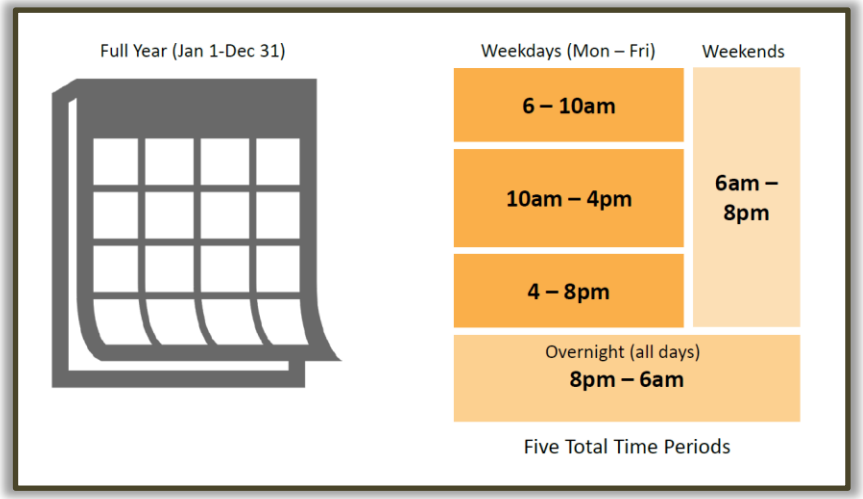
METHODOLOGY

This measure examines the reliability of moving freight via truck on the regional Interstate system. The reliability of freight movement is calculated using a new metric referred to as the Truck Travel Time Reliability (TTTR) Index. The TTTR ratio is defined as the ratio of the 95th percentile travel time for trucks to the mean (50th percentile) travel time for trucks. This travel time information – which is provided through the National Performance Management Research Data Set (NPMRDS) – is collected throughout the year on each segment of the Interstate system in 15-minute intervals. An example of calculating this ratio is shown below:

$$\text{Truck Travel Time Reliability} = \frac{95th\ percentile\ truck\ travel\ time}{50th\ percentile\ truck\ travel\ time\ (\text{"}normal\ \text{truck}\ travel\ time\text{"})}$$



Truck travel times throughout the year are divided into five reporting periods: Weekday morning peak, weekday midday, weekday afternoon peak, weekends, and overnight. The time of day that each period represents is shown below:



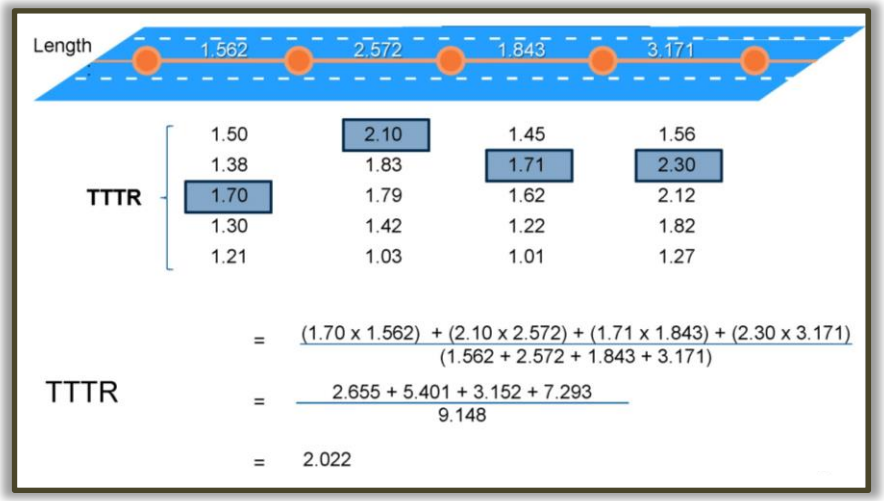
A TTTR ratio is calculated for each Interstate segment by direction for each of these time periods over the course of an entire year. This produces a total of five TTTR ratios for each Interstate segment. For each segment, the maximum of these five TTTR ratios is determined and used to calculate the regional index. This calculation is highlighted on the next page:

FREIGHT

$$\frac{\text{Longer Truck Travel Time (95th)}}{\text{Normal Truck Travel Time (50th)}} = \frac{\text{\# seconds}}{\text{\# seconds}} = \text{Truck Travel Time Reliability (TTTR) Ratio}$$

Truck Travel Time Reliability (TTTR) (Single Segment, Interstate Highway System)		
Monday – Friday	6am – 10am	$TTTR = \frac{72 \text{ sec}}{50 \text{ sec}} = 1.44$
	10am – 4pm	TTTR = 1.39
	4pm – 8pm	TTTR = **1.49**
Weekends	6am – 8pm	TTTR = 1.31
Overnight	8pm – 6am	TTTR = 1.20
Maximum TTTR		**1.49**

These individual Interstate segment Maximum TTTR ratios are then multiplied by the length of that particular segment. These products are added together for the entire region and divided by the total directional length of the regional Interstate system to produce the regional Truck Travel Time Reliability Index. An example of this calculation is shown to the right:



FREIGHT

CURRENT/HISTORICAL CONDITIONS

The following chart shows the Truck Travel Time Reliability (TTTR) Index for the Interstate system in Hampton Roads and throughout Virginia for 2016 and 2017.

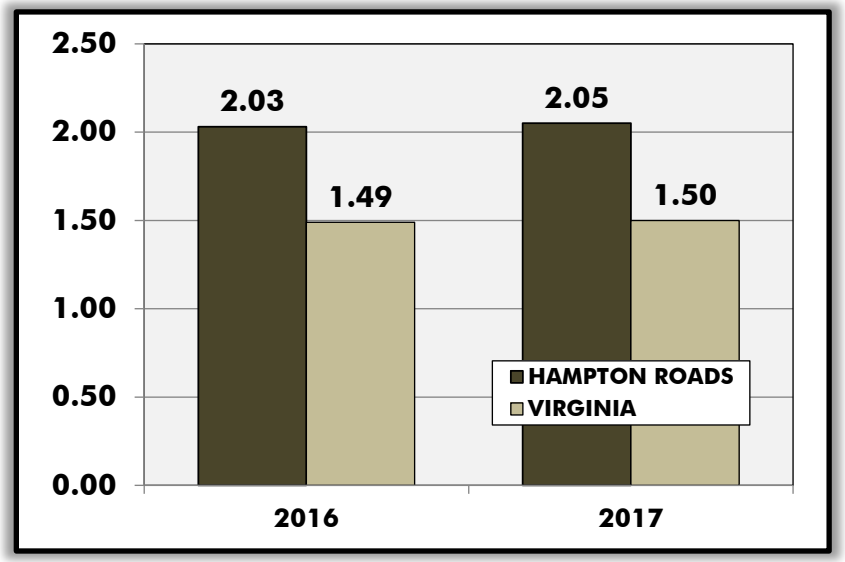
In addition, the map to the right graphically shows the TTTR on Interstate roadways in Hampton Roads in 2017.

STATEWIDE 4-YEAR TARGETS (2018-2021)

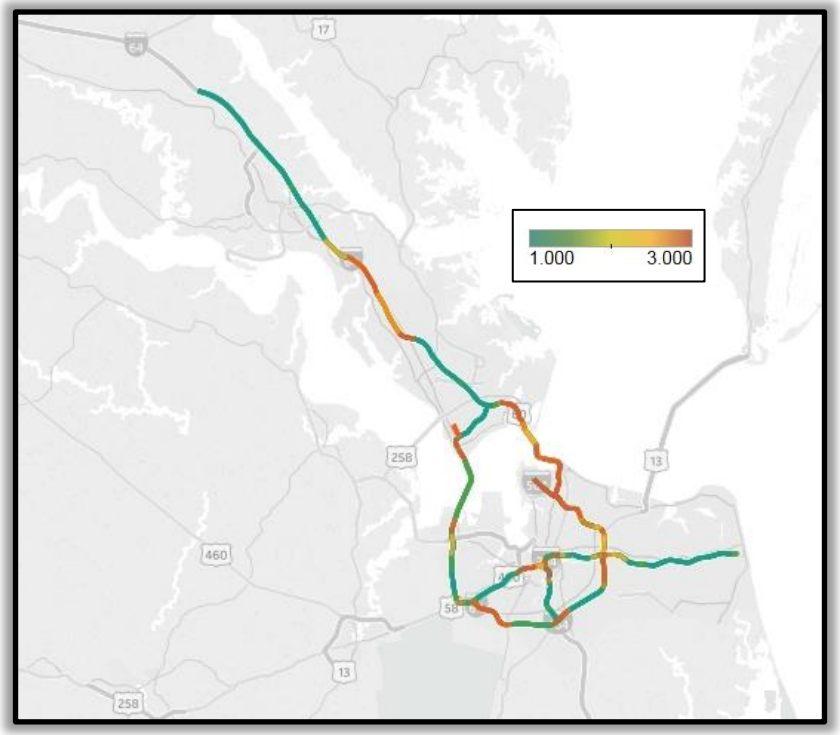
- **Truck Travel Time Reliability (TTTR) Index - Interstate** **< 1.56**

The statewide four-year target established by the Commonwealth Transportation Board (CTB) is based on VDOT's projection of a 1.06% annual increase statewide in the TTTR Index.

TRUCK TRAVEL TIME RELIABILITY INDEX - INTERSTATE (2016 & 2017)



TRUCK TRAVEL TIME RELIABILITY INDEX - INTERSTATE (2017)

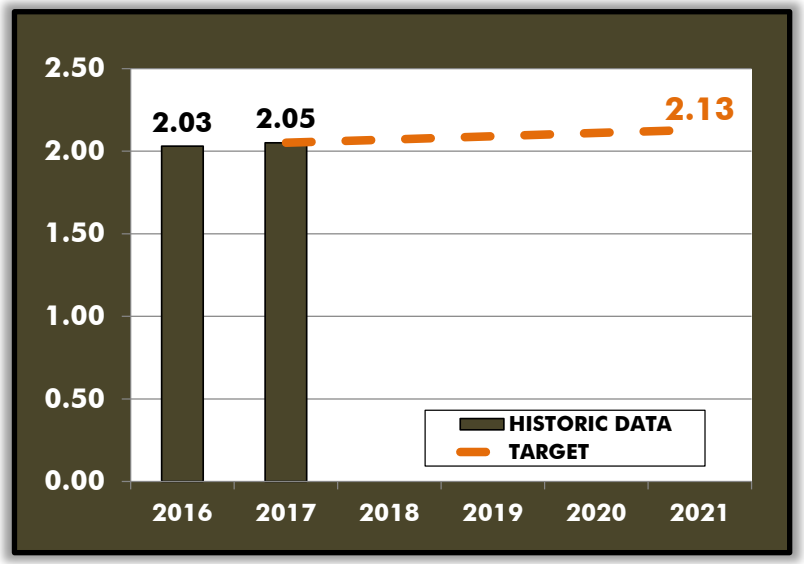


HRTPO 4-YEAR TARGETS (2018-2021)

The HRTPO established a four-year target for the Truck Travel Time Reliability Index on the Interstate system of less than 2.13. **This target was chosen by applying VDOT's expected annual statewide increase in the TTTR Index** (1.06%) to the TTTR Index in Hampton Roads in 2017.

➤ **Truck Travel Time Reliability Index (Interstate System)**	**< 2.13**

TRUCK TRAVEL TIME RELIABILITY INDEX - INTERSTATE



SUMMARY

The Moving Ahead for Progress in the 21st Century (MAP-21) surface transportation legislation established a performance- and outcome-based program. As part of this program, MAP-21 and the current Fixing America's Surface Transportation (FAST) Act legislation require that States and Metropolitan Planning Organizations (MPOs) prepare and use a set of federally-established performance measures that are tied to national performance goals.

Each MPO must set regional targets in the areas of roadway safety, pavement condition, bridge condition, Transit Asset Management, roadway performance, and freight. These performance measures and targets must be reported based on the MPO's Metropolitan Planning Area (MPA). The Hampton Roads MPA is comprised of 15 localities including all of Chesapeake, Hampton, Isle of Wight County, James City County, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, Williamsburg, and York County and portions of Franklin, Gloucester County, and Southampton County.

For roadway safety and Transit Asset Management, targets are established for a one-year time horizon and must be set on an annual basis. For the bridge condition, pavement condition, roadway performance and freight measures, MPO targets are established for a four-year time horizon, whereas states establish both two-year and four-year targets. For target setting, MPOs may adopt the statewide targets but report metrics specific to the MPA; select unique, MPO specific targets, and report metrics specific to the MPA; or use a combination of statewide and unique targets.

Setting the initial HRTPO targets – which are shown on the next page – was a collaborative effort. The Transportation Technical Advisory Committee (TTAC) recommended targets for the HRTPO Board to consider. In order to assist the TTAC, the committee formed a Performance Measure Working Group. This Working Group included staff from localities, transit agencies, VDOT, and subject-matter experts.

This Regional Performance Measures – System Performance Report will be updated on an annual basis to reflect revised targets as well as progress towards meeting the established targets. In addition to this document, the HRTPO also maintains a Regional Performance Measures and Targets website which includes information on each of these performance measures as well as the basis for selecting each regional target. The HRTPO Regional Performance Measures and Targets website is **https://www.hrtpo.org/page/regional-performance-measures-and-targets**.

SUMMARY

CURRENT HAMPTON ROADS REGIONAL TARGETS ESTABLISHED BY THE HRTPO BOARD

ONE-YEAR TARGETS

ROADWAY SAFETY AND TRANSIT ASSET MANAGEMENT

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

FOUR-YEAR TARGETS

BRIDGE CONDITION, PAVEMENT CONDITION, ROADWAY PERFORMANCE, AND FREIGHT

Area	Measures	HRTPO Approved Four-Year Target (2021)
Bridge Condition	NHS bridge deck area in good condition	**20%**
	NHS bridge deck area in poor condition	**< 3.0%**
Pavement Condition	Interstate System pavement in good condition	**45%**
	Interstate System pavement in poor condition	**< 3%**
	Non-Interstate System NHS pavement in good condition	**25%**
	Non-Interstate System NHS pavement in poor condition	**< 5%**
Roadway Performance	Interstate Travel Time Reliability	**82%**
	Non-Interstate NHS Travel Time Reliability	**82.5%**
Freight	Truck Travel Time Reliability Index	**2.13**

STATE PERFORMANCE MEASURES

In 2009, the General Assembly of Virginia passed legislation codifying regional transportation performance measurement. In response to the legislation, HRTPO staff, in cooperation with other Virginia metropolitan areas and Virginia's Office of Intermodal Planning and Investment (OIPI), developed a list of regional performance measures (RPMs). The HRTPO Board approved this list in January 2011 and the Commonwealth Transportation Board (CTB) approved it in June 2011.

The Hampton Roads regional performance measures (RPMs) include approximately 70 measures, which are organized in the following 12 categories:

- Transportation System Measures
  - Congestion Reduction
  - Safety
  - Transit Usage
  - HOV Usage
  - Job-to-Housing Ratios
  - Job and Housing Access to Transit
  - Job and Housing Access to Pedestrian Facilities
  - Air Quality
  - Movement of Freight
  - Vehicle Miles Traveled (VMT)
  - Maintenance
- Financial System Measures

The first ten categories were suggested by the Commonwealth; the last two – Maintenance and Financial – were added by the Transportation Technical Advisory Committee (TTAC).

In April 2012, the HRTPO Board approved a set of targets for its RPMs. Lacking a basis for setting numerical targets, the HRTPO, with the approval of the TTAC's RPM Task Force, decided to set trend targets – increasing a particular value, decreasing a particular value, or maintaining that particular value.

This annual HRTPO Regional Performance Measures effort will be updated annually as part of this System Performance report. The RPM values and targets are presented on the following pages. The desired direction of each target and the success in meeting these goals is indicated by the following:

goal: maintain value

goal: increase value

goal: decrease value

- Green indicates that the actual trend is following the desired trend
- Orange indicates that the actual trend is directionally opposite to the desired trend
- Blue indicates an unclear trend.

STATE PERFORMANCE MEASURES

A. Transportation System Performance Measures[13]

Actual Trend is Following Desired Trend

Actual Trend is Going Against Desired Trend

Actual Trend Unclear

	Data Source	Year 2008	Year 2009	Year 2010	Year 2011	Year 2012	Year 2013	Year 2014	Year 2015	Year 2016	Year 2017	Year 2018	Desired Trend
1. congestion reduction													
Annual Delay, hours per peak auto commuter	TTI	43	42	43	43	43	44	45	n.a.	n.a.	n.a.	n.a.	
Annual Excess Fuel Consumed, gallons per peak auto commuter	TTI	18	17	18	18	18	18	19	n.a.	n.a.	n.a.	n.a.	
Travel Time Index (extra time during peak period), %	Inrix/TomTom	18%	18%	18%	18%	18%	19%	19%	18%	18%	n.a.	n.a.	
2. safety													
Annual Roadway Fatalities, number	DMV[24]	153	124	121	136	99	131	125	121	125	155	n.a.	
Annual Roadway Fatalities, per 100 million VMT[25]	DMV[24]	1.01	0.97	0.89	0.86	0.81	0.84	0.88	0.84	0.84	1.03	n.a.	
Annual Roadway Injuries, number	DMV[24]	14,465	14,004	13,449	14,038	15,034	15,432	14,715	14,955	16,628	16,578	n.a.	
Annual Roadway Injuries, per million VMT	DMV[24]	0.97	0.95	0.90	0.96	1.04	1.07	1.04	1.03	1.11	1.11	n.a.	
Annual Roadway Crashes, number	DMV[24]	27,599	24,005	23,142	24,115	25,192	25,374	24,874	25,310	26,853	26,765	n.a.	
Annual Roadway Crashes, per million VMT	DMV[24]	1.86	1.63	1.55	1.65	1.74	1.77	1.76	1.75	1.80	1.79	n.a.	
Annual Transit Fatalities, number	FTA[6]	0	0	0	1	1	0	0	0	3	n.a.	n.a.	0
Annual Transit Fatalities, per 100 million PMT	FTA[6]	0.00	0.00	0.00	0.85	0.81	0.00	0.00	0.00	3.65	n.a.	n.a.	0
Annual Transit Injuries, number	FTA[6]	81	109	135	113	73	95	98	123	187	n.a.	n.a.	
Annual Transit Injuries, per 100 million PMT	FTA[6]	69	102	118	96	59	86	101	145	227	n.a.	n.a.	
Annual Transit Collisions[19], number	FTA[6]	15	27	40	30	26	35	30	39	49	n.a.	n.a.	
Annual Transit Collisions[19], per 100 million PMT	FTA[6]	13	25	35	26	21	32	31	46	60	n.a.	n.a.	
Annual Aviation Fatalities[22], number[23]	NTSB	0	0	1	2	0	8	0	3	0	0	n.a.	0
Annual Aviation Accidents[22], number[23]	NTSB	5	6	8	3	1	5	3	3	9	4	n.a.	
Annual Hwy-Rail Crossing Accidents[20], per million population	FRA	4	5	2	1	4	4	5	3	3	3	n.a.	
3. transit usage													
Annual Unlinked Passenger Trips (UPT), number	APTA/FTA[6]	29,267,974	18,907,492	18,646,984	19,371,225	21,234,400	21,361,191	19,987,547	19,085,376	17,942,371	16,814,136	n.a.	
Annual Unlinked Passenger Trips (UPT), per capita[21]	HRTPO Calculation	20	13	13	13	14	14	13	12	12	11	n.a.	
Annual Vehicle Revenue Miles (VRM), number	FTA[6]	15,547,333	16,659,349	15,972,878	16,016,548	16,158,133	15,634,645	15,552,017	16,084,113	16,857,027	n.a.	n.a.	
Annual Vehicle Revenue Miles (VRM), per capita[21]	HRTPO Calculation	11	11	11	11	11	10	10	10	11	n.a.	n.a.	
Annual Passenger Miles Traveled (PMT), number	FTA[6]	117,881,067	107,055,827	114,165,464	117,148,805	123,461,216	110,291,173	96,842,639	84,926,722	82,243,560	n.a.	n.a.	
Annual Passenger Miles Traveled (PMT), per capita[21]	HRTPO Calculation	80	72	77	78	82	72	63	55	53	n.a.	n.a.	
Passengers Boarding or Departing Amtrak Trains (HR)[32]	Amtrak	166,839	158,914	163,405	175,494	195,263	229,524	215,578	221,917	211,887	214,501	n.a.	
Endpoint On-Time Performance, Amtrak (Rich/NN/Nor")[5 32]	Amtrak	n.a.	n.a.	n.a.	76%	85%	84%	73%	71%	78%	73%	n.a.	
Operating Cost Ratio[30], Amtrak ("Washington-Newport News" & "Washingt	Amtrak	n.a.	n.a.	n.a.	0.99	0.87	0.98	0.76	0.81	0.76	0.78	n.a.	

See page 37 for an explanation of footnotes.

STATE PERFORMANCE MEASURES

	Data Source	Year 2008	Year 2009	Year 2010	Year 2011	Year 2012	Year 2013	Year 2014	Year 2015	Year 2016	Year 2017	Year 2018	Desired Trend
4. HOV usage													
Persons per Hour per HOV Ln During Peak Period, avg of count stations	VDOT	598	637	685	571	638	598	612	525	679	717	n.a.	
# of Park and Ride Spaces	VDOT	n.a.	n.a.	n.a.	n.a.	4,423	n.a.	n.a.	4,193	3,069	3,075	3,075	
# of Occupied Park and Ride Spaces, per 100,000 population	VDOT	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	64	63	56	n.a.	
% of Commuters with Journey-to-Work via Carpool[10]	Census	n.a.	n.a.	9.4%	8.1%	8.9%	8.3%	8.2%	7.8%	9.3%	n.a.	n.a.	
5. job-to-housing ratios													
Ratio of Jobs to Labor Force[2]													
Hampton Roads	VWC[34] & HRPDC	0.95	0.95	0.93	0.92	0.92	0.92	0.91	0.93	0.93	0.92	n.a.	
Chesapeake	VWC[34] & HRPDC	0.88	0.88	0.90	0.89	0.88	0.87	0.86	0.88	0.87	0.86	n.a.	n.a.
Gloucester	VWC[34] & HRPDC	0.49	0.49	0.51	0.51	0.52	0.52	0.50	0.51	0.51	0.50	n.a.	n.a.
Hampton	VWC[34] & HRPDC	0.89	0.91	0.92	0.90	0.91	0.90	0.88	0.89	0.90	0.89	n.a.	n.a.
Isle of Wight	VWC[34] & HRPDC	0.65	0.64	0.58	0.55	0.57	0.59	0.58	0.60	0.60	0.58	n.a.	n.a.
James City	VWC[34] & HRPDC	0.87	0.86	0.87	0.86	0.87	0.84	0.84	0.85	0.87	0.87	n.a.	n.a.
Newport News	VWC[34] & HRPDC	1.15	1.09	1.15	1.16	1.16	1.15	1.15	1.16	1.14	1.14	n.a.	n.a.
Norfolk	VWC[34] & HRPDC	1.51	1.54	1.33	1.33	1.32	1.30	1.28	1.34	1.34	1.33	n.a.	n.a.
Poquoson	VWC[34] & HRPDC	0.33	0.34	0.30	0.29	0.29	0.27	0.27	0.28	0.29	0.30	n.a.	n.a.
Portsmouth	VWC[34] & HRPDC	0.98	1.03	1.03	1.04	1.05	1.07	1.05	1.08	1.06	1.04	n.a.	n.a.
Suffolk	VWC[34] & HRPDC	0.65	0.66	0.65	0.64	0.69	0.68	0.68	0.71	0.73	0.74	n.a.	n.a.
Virginia Beach	VWC[34] & HRPDC	0.80	0.80	0.77	0.76	0.76	0.77	0.77	0.79	0.80	0.80	n.a.	n.a.
Williamsburg	VWC[34] & HRPDC	3.10	3.02	2.42	2.18	2.18	2.14	2.09	2.11	2.06	2.02	n.a.	n.a.
York	VWC[34] & HRPDC	0.72	0.74	0.71	0.71	0.70	0.70	0.69	0.71	0.71	0.69	n.a.	n.a.
Jobs - Labor Force[2] Regional Linear Dissimilarity Index, 0.0 to 1.0[3]	VWC[34] & HRPDC	0.11	0.11	0.10	0.11	0.11	0.10	0.10	0.10	0.10	0.10	n.a.	
% of Workers Working Outside Locality (City/County) in Which They Live	Census	48%	49%	48%	47%	49%	46%	47%	49%	48%	n.a.	n.a.	
Mean Travel Time to Work, minutes	Census	23.6	23.2	23.7	23.3	24.0	24.0	24.1	24.8	24.0	n.a.	n.a.	
6. job and housing access to transit													
% of Employment in TAZs[1] Served by Transit[18]	HRTPO[1]	n.a.	n.a.	n.a.	84%	84%	84%	84%	85%	85%	84%	n.a.	
% of Households in TAZs[1] Served by Transit[18]	HRTPO[1]	n.a.	n.a.	n.a.	73%	73%	73%	73%	75%	75%	74%	n.a.	
7. job and housing access to pedestrian facilities													
% of Housing Units[9] in areas[17] with 1%+ Walk-To-Work Mode Share	CTPP & ACS[33]	43%	n.a.	n.a.	37%	38%	n.a.	38%	n.a.	n.a.	n.a.	n.a.	
8. air quality													
Annual # of Days when Ozone Levels were Above 8-Hour Standard	DEQ	7	0	6	7	3	0	0	0	3	0	n.a.	0
NOx[7] (from motor vehicles), tons per day (near future)[15]	VDOT	n.a.	n.a.	n.a.	43	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	31.4	32
NOx[7] (from motor vehicles), grams per capita per day (near future)[15]	VDOT	n.a.	n.a.	n.a.	23	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	16.5	
VOC[7] (from motor vehicles), tons per day (near future)[15]	VDOT	n.a.	n.a.	n.a.	35	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	20.9	28
VOC[7] (from motor vehicles), grams per capita per day (near future)[15]	VDOT	n.a.	n.a.	n.a.	19	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	10.9	
CO_2 (greenhouse gas, from motor veh's), tons per day (near future)[15]	VDOT[16]	n.a.	n.a.	n.a.	22,464	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
CO_2 (greenhouse gas, from motor veh's), grams/capita/day (near future)[15]	VDOT[16]	n.a.	n.a.	n.a.	12,076	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	

See page 37 for an explanation of footnotes.

STATE PERFORMANCE MEASURES

	Data Source	Year 2008	Year 2009	Year 2010	Year 2011	Year 2012	Year 2013	Year 2014	Year 2015	Year 2016	Year 2017	Year 2018	Desired Trend
9. movement of freight													
Shares (%) of General Cargo Handled by Port of Virginia, by container	VPA												
Barge	VPA	5%	4%	4%	4%	4%	4%	4%	3%	3%	3%	n.a.	
Rail	VPA	31%	30%	28%	30%	32%	34%	33%	33%	37%	35%	n.a.	
Truck	VPA	64%	66%	68%	66%	64%	62%	63%	64%	61%	62%	n.a.	
		100%	100%	100%	100%	100%	100%	100%	100%	101%	100%		
Rail Mode Share (%), freight with HR origins, by value and tonnage	FAF4												
by tonnage[26]	FAF4	n.a.	n.a.	35%	n.a.	8%	n.a.	n.a.	1.6%	n.a.	n.a.	n.a.	
by value[26]	FAF4	n.a.	n.a.	3%	n.a.	14%	n.a.	n.a.	1.2%	n.a.	n.a.	n.a.	
Rail Mode Share (%), freight with HR destinations, by value and tonnage	FAF4												
by tonnage[26]	FAF4	n.a.	n.a.	44%	n.a.	61%	n.a.	n.a.	48%	n.a.	n.a.	n.a.	
by value[26]	FAF4	n.a.	n.a.	5%	n.a.	23%	n.a.	n.a.	9%	n.a.	n.a.	n.a.	
10. per capita vehicle miles traveled													
Daily Vehicle Miles Traveled (VMT) per capita	VDOT	24.2	24.0	23.8	23.6	23.1	22.7	22.3	22.7	23.3	23.4	n.a.	
% of Commuters with Journey-to-Work by Alternate Modes[8]	Census	20%	18%	19%	19%	19%	18%	18%	18%	20%	n.a.	n.a.	
11. maintenance													
% of Pavement in Non-Deficient Condition, VDOT-maintained roads[27]	VDOT	70%	69%	66%	76%	75%	83%	85%	89%	93%	93%	n.a.	
% of Bridges Not Structurally Deficient	VDOT	n.a.	95%	94%	94%	94%	94%	94%	93%	94%	95%	95%	
Total Transit Revenue Service Interruptions (mechanical) per million PMT	FTA[6]	40	34	45	38	29	27	32	58	46	n.a.	n.a.	
B. Financial System Performance Measures													
Actual Obligations / Planned Obligations[11]	VDOT	n.a.	n.a.	n.a.	n.a.	1.28	0.95	1.14	0.60	0.53	0.72	n.a.	n.a.
Average Age of Federal Dollars Spent on TIP Projects[14]	VDOT	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Mid-Fiscal-Year Total of Unspent Obligations for TIP Projects[12]	VDOT	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
% of Total District Allocn's in SYIP (i.e. omitting St'wide[31]), year one[4]	VDOT												
Bristol	HRTPO Calculation	8%	8%	8%	10%	10%	11%	8%	5%	5%	6%	3%	n.a.
Culpeper	HRTPO Calculation	4%	3%	3%	2%	3%	8%	5%	3%	4%	4%	3%	n.a.
Fredericksburg	HRTPO Calculation	5%	3%	4%	3%	6%	5%	4%	6%	7%	9%	4%	n.a.
Hampton Roads	HRTPO Calculation	18%	18%	13%	16%	21%	29%	28%	36%	34%	27%	22%	
Lynchburg	HRTPO Calculation	4%	3%	3%	2%	2%	2%	1%	2%	4%	5%	3%	n.a.
Northern VA	HRTPO Calculation	35%	39%	46%	51%	37%	25%	31%	26%	27%	22%	49%	n.a.
Richmond	HRTPO Calculation	12%	13%	11%	8%	8%	8%	7%	9%	10%	11%	9%	n.a.
Salem	HRTPO Calculation	8%	7%	7%	3%	7%	8%	8%	6%	6%	8%	5%	n.a.
Staunton	HRTPO Calculation	7%	5%	6%	5%	6%	4%	7%	6%	4%	7%	3%	n.a.
total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	

See page 37 for an explanation of footnotes.

STATE PERFORMANCE MEASURES

Footnotes

1 Transportation Analysis Zone (TAZ) data from regional 4-step model
2 Data employment by job location as "jobs" measure; employment by home location as "labor force" measure
3 Calculated via equation 2 in "Feasibility of Using Jobs/Housing Balance in Virginia Statewide Planning", VTRC, Aug 2010, pg. 26; 0: perfectly balanced; 1: perfectly unbalanced.
4 First fiscal year shown in SYIP, e.g. the "2013" number shown herein comes from the FY13 column of the FY13-18 SYIP.
5 New performance measure for FY13 evaluation (i.e. not included in FY12 evaluation).
6 FTA's National Transit Database
7 These two pollutants (NOx and VOC)--precursors of ground-level ozone--are measured in several Va. MPOs for AQ conformity.
Note: "2011" numbers are from VDOT's MOBILE 6.2 model; subsequent numbers will be calculated using MOVES model, making comparison to earlier numbers difficult.
8 Sum of all modes other than Drove Alone (i.e. including bike, ped, transit, work-at-home, carpool, etc.).
9 Given the necessary proximity of jobs to houses of persons who walk to work, this measure is intended to cover both job and housing access to pedestrian facilities.
10 The goal of HOV lanes--carpooling--is measured herein.
11 Actual obligations ("Obligated") / planned obligations ("TIP"); source: Annual Obligation Report (AOR).
12 "Total" = "Unspent Obligations" for each project, summed over all projects in TIP.
Due to large amount of funds typically obligated near end of fiscal years, "Total" calculated via financial "snapshot" taken near middle of subject fiscal year.
"Unspent Obligations" for a project = (total obligations for any year up to and including FY of snapshot) - (total spent in any year up to snapshot date).
Because the "total obligations" will exclude matching funds, the "total spent" should exclude matching funds.
13 The source of the first ten category names is Section 33.1-23.03 Code of Va. [amended via Chapter 670],
except that "movement of freight" is used herein instead of original "movement of freight by rail"; category 11 and financial RPMs were added by HRTPO.
14 This calculation covers all federal transportation dollars spent during the subject fiscal year.
"Average Age" is a weighted average of the ages of each payment made during the subject fiscal year.
The age of a specific payment is calculated by comparing the date of the payment to the date of the appropriate obligation for that payment.
To calculate "Average Age", weight the age of each payment by the amount of that payment.
If the actual dates are not available, monthly or FY data may be used, e.g. the age of a payment made in FY11 for an obligation made in FY09 is 2.0 years.
15 For air quality conformity, VDOT estimates emissions for various future years including one near future year; NOx and VOC emissions for the ozone season, and CO2 emissions as annual averages.
16 In addition to the pollutants required for AQ conformity, VDOT calculates CO2 when it conducts analyses for conformity.
17 Due to slow release of TAZ data by the CTPP, in later years staff used ACS data by Block Group (block groups being similar in size to TAZs).
18 Due to the relatively large size of a typical TAZ, consider only those TAZs which are bordered or penetrated by transit as being served by transit.
19 FTA's "National Transit Database" uses the term "collisions" ("Collision_Total"), instead of "crashes".
20 FRA uses the term "accidents".
21 Using July estimates from Weldon Cooper for nine localities (Ches., Norf., Ports., Suf., VaB., Hamp., JCC, NN, WImbg.).
Note: The Urbanized Area (UZA) population (which is typically used by FTA) could not be found for inter-census years.
For year 2000, the HR9 Weldon Cooper population (1,413,272) is similar to the Urbanized Area (UZA) population (1,394,439).
22 "Fatalities"= number of people died; "Accidents"=number of crash events; NTSB and FAA use the term "accidents".
23 No rate (e.g. "per PMT") is included here because the number of person-miles-of-travel (PMT) in the airspace above Hampton Roads is not known.
24 "DMV": Department of Motor Vehicles.
25 Rate shown is for a 3-year period ending in year shown.
26 Including domestic portion of international freight movement.
27 VDOT-maintained roadways only.
28 VMT for this year not yet available.
29 PMT for this year not yet available.
30 OCR = "Total Costs excl. OPEB's, Capital Charge and Other Costs" / "Total Revenue". (OPEB: other post-employment benefits)
31 Note: Some large projects (e.g. US 460, I-95 HOT Lanes) are in "Statewide".
32 Note: Norfolk Amtrak began on 12-12-12.
33 CTPP: Census Transportation Planning Products; ACS: American Community Survey
34 VWC: Virginia Workforce Connection

PUBLIC REVIEW AND COMMENTS

As part of the Hampton Roads Transportation Planning Organization's (HRTPO) efforts to provide opportunities for the public and stakeholders to review and comment on this draft report prior to the final product being published, a public review period was conducted from March 5, 2019, through March 22, 2019. No public comments were received.