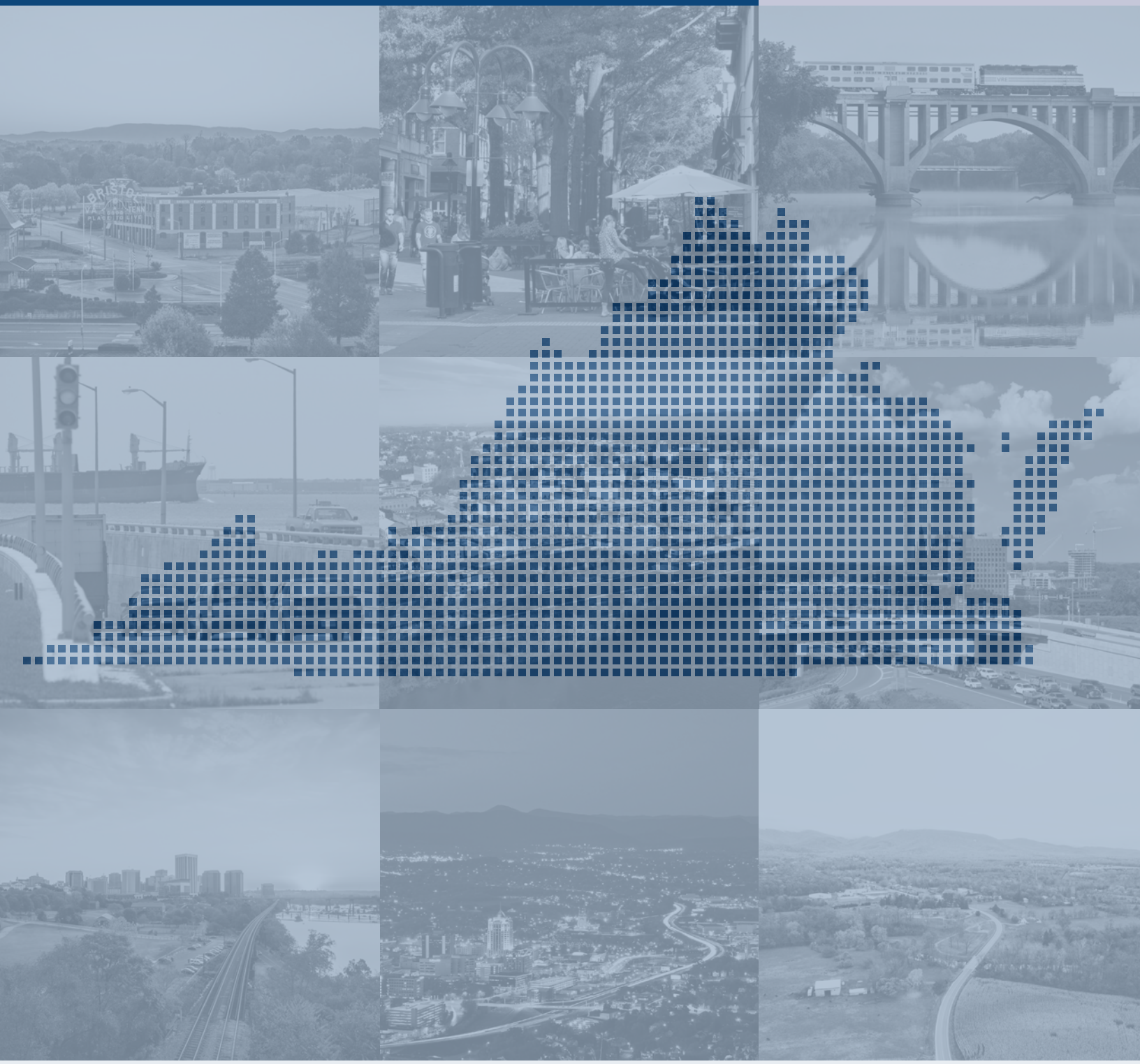
VTRANS: VIRGINIA'S TRANSPORTATION PLAN

Submitted pursuant to 23 U.S.C. § 135, 23 CFR § 450.216, 23 CFR § 450.206 and 49 U.S.C. § 70202 as amended by the Bipartisan Infrastructure Law (BIL/IIJA)

VTRANS | VIRGINIA'S TRANSPORTATION PLAN



PREPARED BY THE OFFICE OF INTERMODAL PLANNING AND INVESTMENT

July 2022

FOR MORE INFORMATION

Visit vtrans.org for additional details, updates, and documentation about the VTrans development process. Please contact the Statewide Transportation Planning (STP) Team at the Office of Intermodal Planning and Investment to request an alternative format.

Office of Intermodal Planning and Investment – Statewide Transportation Planning Section
1221 E. Broad Street, 2nd Floor
Richmond, VA 23219
comment@vtrans.org

Photo Credits:
Top left cover: Joe Vaughn Photography
Internal document: Virginia Department of Transportation

PREPARED BY THE OFFICE OF INTERMODAL PLANNING AND INVESTMENT FOR THE **COMMONWEALTH TRANSPORTATION BOARD**

ACRONYMS

AADT	Average Annual Daily Traffic
BRT	Bus Rapid Transit
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CoSS	Corridor of Statewide Significance
CTB	Commonwealth Transportation Board
DRPT	Virginia Department of Rail and Public Transportation
EEA	Equity Emphasis Area
EV	Electric Vehicles
FHWA	Federal Highway Administration
GHG	Greenhouse Gas
HPMS	Highway Performance Monitoring System
IEDA	Industrial and Economic Development Area
LEP	Limited English Proficiency
LOTTR	Level of Travel Time Reliability
LRS	Linear Referencing System
MPO	Metropolitan Planning Organization
MUTCD	Manual on Uniform Traffic Control Devices
NAICS	North American Industry Classification System
NOX	Nitrogen Oxide
OIPI	Office of Intermodal Planning and Investment
PECC	Percent of Person-miles Traveled in Excessively Congested Conditions
PM	Particulate Matter
PMT	Person-miles Traveled
PSAP	Pedestrian Safety Action Plan
PSI	Potential for Safety Improvement
RITIS	Regional Integrated Transportation Information System
RN	Regional Network
TDM	Transportation Demand Management
TMC	Traffic Message Channel
TTI	Travel Time Index
TTILT	Travel Time Index less than 1.3
TTTR	Truck Travel Time Reliability
UDA	Urban Development Area
USC	United States Code
US DOT	United States Department of Transportation
VBRSP	Virginia Business Ready Sites Program
VDOT	Virginia Department of Transportation
VEDP	Virginia Economic Development Partnership
VGIN	Virginia Geographic Information Network
VMT	Vehicle-miles of Travel
VOC	Volatile Organic Compounds
VRE	Virginia Railway Express

CONTENTS

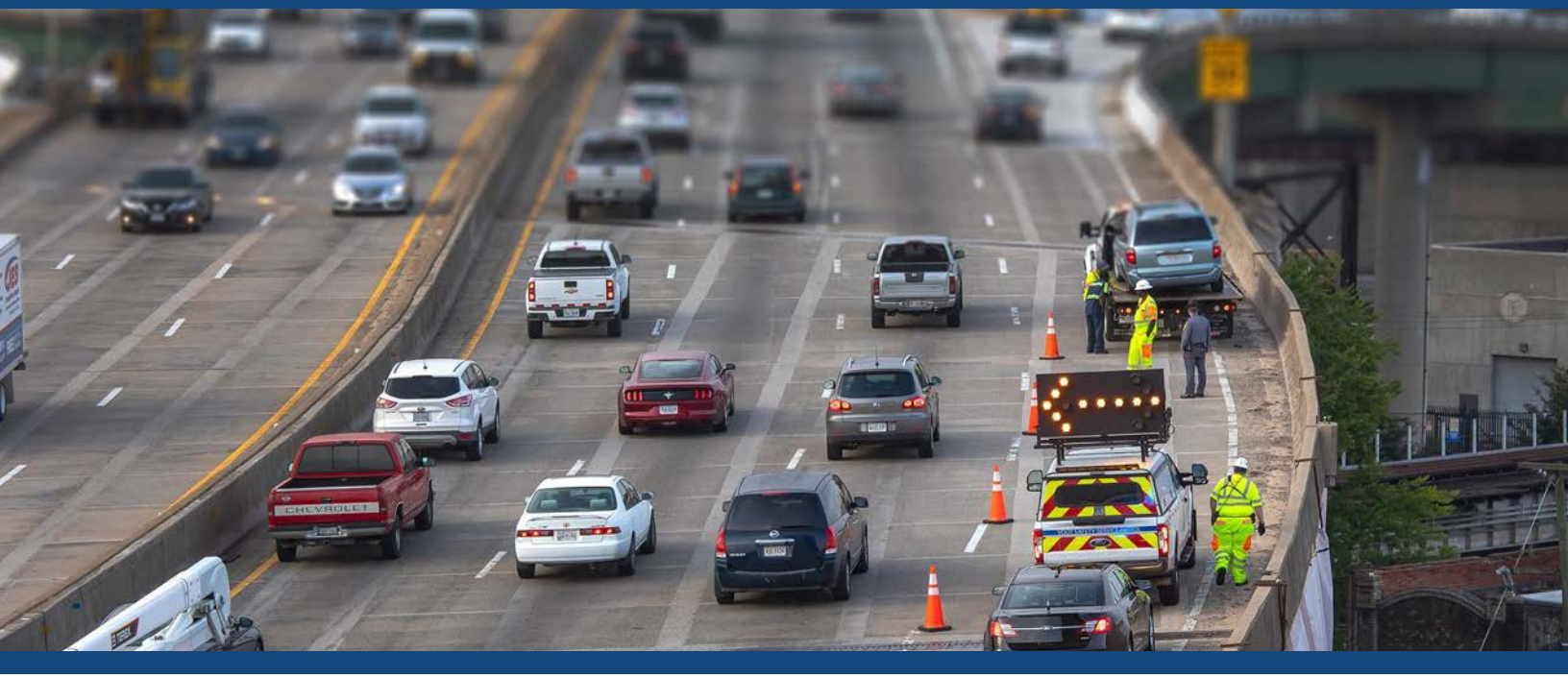
1. Purpose of this Report	6
2. Introduction to VTrans – Virginia's Transportation Plan	8
3. VTrans Vision, Guiding Principles, Goals, and Objectives	10
4. Mid-term Planning	12
5. Long-term Planning	41
6. Strategic Actions	50
Appendix A: Synthesis of Federal Requirements and VTrans Activities	A-1
Appendix B: Critical Freight Corridor Designation	B-1
Appendix C: Freight Performance Measures Methodology Documentation	C-1
Appendix D: Stakeholder Engagement	D-1
Appendix E: System Performance Report	E-1
Appendix F: Freight Investment Plan	F-1

FIGURES

Figure 1: Purposes Served by VTrans	6
Figure 2: Major Components of VTrans - Virginia's Transportation Plan	8
Figure 3: VTrans Mid-term Needs	18
Figure 4: Steps for Prioritization of the VTrans Mid-term Needs	19
Figure 5: VDOT Construction District Priority Locations (Directional Roadway Miles)	24
Figure 6: Statewide Transportation Priority Locations (Directional Roadway Miles)	25
Figure 7: Top 10 Commodities Originating in Virginia by Tonnage	28
Figure 8: Top 10 Commodities Terminating in Virginia by Tonnage	28
Figure 9: Annual Twenty-foot Equivalent Units (TEUs)* for Select Atlantic Coast Seaports	29
Figure 10: Total Rentable Area of Warehouse and Distribution Centers by VDOT Construction District	30
Figure 11: Number of Facilities by Year Built in Each VDOT Construction District	31
Figure 12: Number of Warehouse and Distribution Center Facilities by closest Corridor of Statewide Significance	31
Figure 13: Freight Commodity Flows Interactive Mapping Application	33
Figure 14: Freight Commodity Flows Interactive Mapping Application: Word Cloud of Commodity Types	33
Figure 15: Identification of Freight Issues – Safety, Congestion, and Reliability	34
Figure 16: Container Ship Calls by Ship Category, Port of Virginia and Private Terminals	35
Figure 17: Evolution of Container Ships	35
Figure 18: Modal Share of Freight Ton-miles by Distance Band	36
Figure 19: Active Military Installations, STRAHNET, and CoSS	39
Figure 20: Steps for the Development and Monitoring of VTrans Long-term Risk & Opportunity Register	41
Figure 21: Impact of Macrotrends	45

TABLES

Table 1: VTrans Goals and Associated VTrans Mid-term Needs Categories	16
Table 2: Geographical Levels of Prioritization and Applicable Travel Markets	20
Table 3: Weighting to Establish Statewide and Construction District Priority Locations	22
Table 4: Freight Element Layers available on InteractVTrans	27
Table 5: Commodity Flows within Virginia by Destination	32
Table 6: Commodity Flows within Virginia by Origin	32
Table 7: Summary of Emerging Freight Trends	37
Table 8: VTrans Mega- and Macrotrends	40
Table 9: Metrics for CTB Goals	41
Table 10: Order of Influence of Macrotrends and Influence of Macrotrends on Surrogate Calculations	42
Table 11: VTrans Long-term Risk & Opportunity Register	44
Table 12: VTrans Trend Trackers	46
Table 13: Federal Requirements and Reference Chapter	A-2
Table 14: Designated CRFC Routes	B-2
Table 15: Designated CUFC Routes	B-3
Table 16: Fiscal Constraint - National Highway Freight Program	F-2
Table 17: National Highway Freight Program Project Listing	F-2



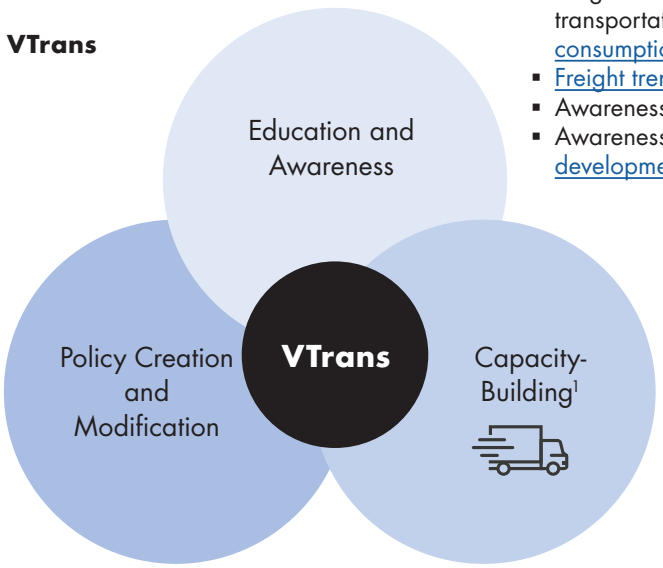
1. PURPOSE OF THIS REPORT

This report documents activities associated with VTrans, Virginia's Transportation Plan, completed in accordance with applicable federal statutory and regulatory requirements, namely 23 U.S.C. § 135, 23 CFR § 450.216, 23 CFR § 450.206 and 49 U.S.C. § 70202 as amended by the Bipartisan Infrastructure Law (BIL/IIJA). For additional information on how VTrans meets the relevant Federal requirements, see Appendix A: Synthesis of Federal Requirements and VTrans Activities.

This document synthesizes statewide planning activities conducted for the development of VTrans and includes references and weblinks that allow for the gathering of more detailed information. This document is not intended to be an official record of State regulations or policies, and to that end, it does not provide the entire text, nor does it provide detailed interpretation or discuss the nuance of these policy items. Weblinks are used to provide users with easy access to more detailed and up-to-date information.

Beyond meeting requirements, VTrans serves a wide range of purposes as shown in the figure below:

Figure 1: Purposes Served by VTrans



- Mega- and macrotrends that impact transportation (climate, technology, consumption, socio-demographics)
- Freight trends
- Awareness of safety needs
- Awareness of industrial and economic development access needs

- Policy for the Identification and Prioritization of VTrans Mid-Term Needs
- Policy for the Development and Monitoring of the VTrans Long-term Risk & Opportunity Register

- InteractVTrans – Online tool to access and download data
  - Map Explorer
  - Data Explorer
- Tool for localities to visualize and access data for roadways at risk of flooding
- Publication describing methods and techniques that can be used by regional entities

[1] Corresponds to National Freight Strategic Plan Goal: Prepare for the future by supporting the development of data, technologies, and workforce capabilities that improve freight system performance.

1.1 Document Organization

This document is organized as follows:

- Section 2 provides an overview of VTrans, including an introduction to the four major components and two planning horizons.
- Section 3 describes the first major component of VTrans, the development of the Commonwealth Transportation Board's (CTB) Vision, Guiding Principles, Goals, and Objectives, which form the basis of the other major components.
- Section 4 details activities related to Mid-term Planning, the second major component of VTrans.
- Section 5 details activities related to Long-term Planning, the third major component of VTrans.
- Section 6 provides an overview of Strategic Actions, the fourth and final major component of VTrans.
- Appendices A-F provide additional documentation relevant to the purpose of the report.

InteractVTRANS This symbol is used to indicate availability of information via the InteractVTrans Map Explorer and/or InteractVTrans Data Explorer. Information is provided via website to ensure the sharing of up-to-date materials between acceptance or adoption of planning documents.[1]

This symbol is used to indicate items relevant to or included in the VTrans Freight Element.

[1] Corresponds to National Freight Strategic Plan Goal: Prepare for the future by supporting the development of data, technologies, and workforce capabilities that improve freight system performance.

2. INTRODUCTION TO VTRANS – VIRGINIA'S TRANSPORTATION PLAN

VTrans is the multimodal plan to advance the Commonwealth Transportation Board's (CTB) vision for transportation in Virginia. The CTB, with assistance from the Office of Intermodal Planning and Investment (OIPI),[1] develops VTrans to identify transportation needs which may be addressed by multimodal infrastructure improvement projects, transportation strategies, creation of new policies, or modifications of existing policies. This report addresses the VTrans policies as depicted in Figure 2.

Figure 2: Major Components of VTrans - Virginia's Transportation Plan

[1] Office of Intermodal Planning and Investment of the Secretary of Transportation established pursuant to § 2.2-229

VTrans Planning Horizons

The CTB identifies needs for the following two planning horizons.

- Mid-term Planning Horizon: VTrans' analysis for the mid-term planning horizon identifies some of the most pressing transportation issues that need to be addressed over the next 10 years. These needs are referred to as VTrans Mid-term Needs. The needs are identified so that they can inform or guide transportation policies, strategies, and infrastructure improvements developed and implemented by the Virginia Department of Transportation (VDOT) and the Department of Rail and Public Transportation (DRPT), as well as local and regional entities.
- Long-term Planning Horizon: VTrans' analysis for long-term planning identifies risks and opportunities for a 20-plus-year planning horizon that may require gradual and systematic shifts in policy.

Federal and State Requirements for VTrans

There are several statutory and regulatory requirements that guide and inform VTrans.

Federal Transportation Planning and Performance Reporting Requirements

Federal requirements per 23 U.S.C. § 135 call for States to develop a statewide transportation plan for "the development and integrated management and operation of transportation systems and facilities (including accessible pedestrian walkways, bicycle transportation facilities, and intermodal facilities that support intercity transportation, including intercity buses and intercity bus facilities and commuter vanpool providers) that will function as an intermodal transportation system for the State and an integral part of an intermodal transportation system for the United States." In addition to that, VTrans meets the requirements associated with 23 CFR § 450.216, Development and content of the long-range statewide transportation plan, and 49 U.S.C. § 70202, State Freight Plans. VTrans also aims to meet the national Federal-aid Highway Program performance goals as outlined in 23 USC §150.

Virginia Transportation Planning and Programming Requirements

There are several direct or indirect transportation planning requirements or related items in the Code of Virginia that are addressed by VTrans. Some of the key requirements are:

- Develop and Update Statewide Transportation Plan: Code of Virginia § 33.2-353 requires OIPI to assist the CTB in the development and update of a statewide transportation plan that includes assessment of capacity needs of "travel markets," which are discussed in Section 4.1. Per the code, the CTB must update the plan at least once every 4 years.
- Role of OIPI: Code of Virginia § 2.2-229 establishes the OIPI within the Office of the Secretary of Transportation, and charges OIPI to assist the CTB in the development of a comprehensive, multimodal transportation policy, which may be developed as part of the Statewide Transportation Plan pursuant to § 33.2-353.
- Statewide Prioritization Process for Project Selection: Pursuant to Code of Virginia § 33.2-214.1, locally and regionally proposed projects funded through the CTB's SMART SCALE Program must meet one or more identified VTrans Mid-term Needs.
- Eligibility for Revenue-sharing Funds: Pursuant to Code of Virginia § 33.2-357, VTrans Mid-term Needs are utilized in the prioritization process for VDOT's Revenue Sharing Program.

3. VTRANS VISION, GUIDING PRINCIPLES, GOALS, AND OBJECTIVES

The first major component of VTrans, development of the Vision, Guiding Principles, Goals, and Objectives, forms the basis upon which the remaining three major components are developed to advance the CTB's vision. The CTB updated and adopted the VTrans Guiding Principles, Goals, and Objectives in 2020.[1]

Vision

Virginia's multimodal transportation system will be Good for Business, Good for Communities, and Good to Go. Virginians will benefit from a sustainable, reliable transportation system that advances Virginia businesses, attracts a 21st century workforce, and promotes healthy communities where Virginians of all ages and abilities can thrive.

Guiding Principles

GP1: Optimize Return on Investments
Implement the right solution at the right price, striving to meet current needs while advancing long-term prosperity and livability.

GP2: Ensure Safety, Security, and Resiliency
Provide a transportation system that is safe for all users, responds immediately to short-term shocks such as weather events or security emergencies, and adapts effectively to long-term stressors such as sea level rise.

GP3: Efficiently Deliver Programs[2]
Deliver high-quality projects and programs in a cost-effective and timely manner.

GP4: Consider Operational Improvements and Demand Management First
Maximize capacity of the transportation network through increased use of technology and operational improvements as well as managing demand for the system before investing in major capacity expansions.

GP5: Ensure Transparency and Accountability, and Promote Performance Management
Work openly with partners and engage stakeholders in project development and implementation. Establish performance targets that consider the needs of all communities, and measure progress towards targets. Adjust programs and policies as necessary to achieve the established targets.

GP6: Improve Coordination Between Transportation and Land Use
Encourage local governments to plan and manage transportation-efficient land development by providing incentives, technical support, and collaborative initiatives.

GP7: Ensure Efficient Intermodal Connections
Provide seamless connections between modes of transportation to harness synergies.

[1] Commonwealth Transportation Board, Actions to Approve the 2019 VTrans Vision, Goals, Objectives, Guiding Principles and the 2019 Mid-term Needs Identification Methodology and Accept the 2019 Mid-term Needs, January 15, 2020

[2] Corresponds to 23 USC §150

Goals[1]	Objectives
Goal A: Economic Competitiveness and Prosperity[2] Invest in a transportation system that supports a robust, diverse, and competitive economy	**Objectives:** ▪ A.1. Reduce the amount of travel that takes place in severe congestion ▪ A.2. Reduce the number and severity of freight bottlenecks ▪ A.3. Improve reliability on key corridors for all modes
Goal B: Accessible and Connected Places Increase opportunities for people and businesses to efficiently access jobs, services, activity centers, and distribution hubs	**Objectives:** ▪ B.1. Reduce average peak-period travel times in metropolitan areas ▪ B.2. Reduce average daily trip lengths in metropolitan areas ▪ B.3. Increase the accessibility to jobs via transit, walking, and driving in metropolitan areas
Goal C: Safety for All Users[3] Provide a safe and secure transportation system for passengers and goods on all travel modes	**Objectives:** ▪ C.1. Reduce the number and rate of motorized fatalities and serious injuries ▪ C.2. Reduce the number of nonmotorized fatalities and serious injuries
Goal D: Proactive System Management[4] Maintain the transportation system in good condition and leverage technology to optimize existing and new infrastructure	**Objectives:** ▪ D.1. Improve the condition of all bridges based on deck area ▪ D.2. Increase the lane miles of pavement in good or fair condition ▪ D.3. Increase the percentage of transit vehicles and facilities in good or fair condition
Goal E: Healthy Communities and Sustainable Transportation Communities Support a variety of community types promoting local economies and healthy lifestyles that provide travel options, while preserving agricultural, natural, historic, and cultural resources	**Objectives:** ▪ E.1. Reduce per-capita vehicle miles traveled ▪ E.2. Reduce transportation related nitrogen oxides, volatile organic compounds, particulate matter, and carbon monoxide emissions ▪ E.3. Increase the number of trips traveled by active transportation (bicycling and walking)

[1] Corresponds to 23 USC §150

[2] Corresponds to 49 U.S.C. § 70101[b](1), (A) and (B), National multimodal freight policy

[3] Corresponds to 49 U.S.C. § 70101[b](2), National multimodal freight policy and National Freight Strategic Plan Goal: Improve the safety, security, and resilience of the national freight system.

[4] Corresponds to 49 U.S.C. § 70101[b](3), National multimodal freight policy

4. MID-TERM PLANNING

4.1 Policy for the Identification of VTrans Travel Markets

Per Code of Virginia § 33.2-353 VTrans Mid-term Needs are established for three distinct travel markets: Corridors of Statewide Significance (CoSS), Regional Networks (RN), and Urban Development Areas (UDAs). In addition, VTrans identifies safety needs based on CTB policy. This section includes a definition and key characteristics of each travel market.

4.1.1 Corridors of Statewide Significance (CoSS)

- **Number:** 12
- **Definition:** An integrated set of multimodal transportation facilities to support interregional travel of people and goods within and outside the State
- **Purpose:**
  - Support interregional and interstate travel
  - Connect major centers of activity within and through the Commonwealth
  - Promote the movement of people and goods essential to the economic prosperity of the State
- **Established:**
  - Eleven (11) corridors were established[1] as part of VTrans2035 in December 2009, and one was established[2] in May 2011. A modification was made in January 2020.[3]
- **Characteristics:**
  - Multimodal – must involve multiple modes of travel or must be an extended freight corridor
  - Connectivity – must connect regions, States, and/or major activity centers
  - High volume – must involve a high volume of travel
  - Function – must provide a unique statewide function and/or address statewide goals

[1] Commonwealth Transportation Board, VTrans2035 – Virginia's Statewide Multimodal Long-Range Transportation Plan, December 17, 2009.

[2] Commonwealth Transportation Board, Northern Virginia North-South Corridor of Statewide Significance, May 18, 2011.

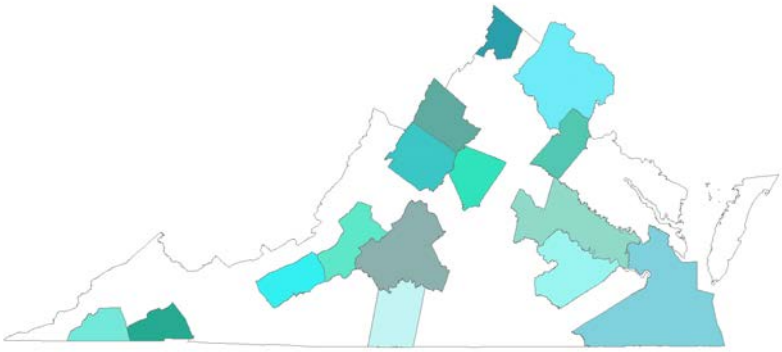
[3] Commonwealth Transportation Board, Actions to Approve the 2019 VTrans Vision, Goals, Objectives, Guiding Principles and the 2019 Mid-term Needs Identification Methodology and Accept the 2019 Mid-term Needs, January 15, 2020.

4.1.2 Regional Networks (RN)

- **Number:** 15

- **Definition:** Based on designated Metropolitan Planning Organizations (MPO) within the Commonwealth. If an MPO boundary includes only a portion of a county, the entire county will be included in the needs analysis area.

- **Purpose:**
  - Support intra-regional travel
  - Bridge the gap between existing conditions and the desired future for the State's economy



- **Established:**
  - Fifteen RNs were established in December 19, 2015[1]
  - Fauquier County added to Northern Virginia RN as of March 16, 2021, as per Metropolitan Washington Council of Governments MPO Study Area boundary change in 2014[2]

- **Characteristics:**
  - At least 50,000 people in an urbanized area per U.S. Census estimates
  - RNs include VTrans Activity Centers, which are "areas of regional importance that have a high density of economic and social activity" and are associated with the RNs

[1] Commonwealth Transportation Board, VTrans2040 Virginia's Statewide Multimodal Long-Range Transportation Plan Vision Plan and Needs Assessments, December 9, 2015

[2] Metropolitan Washington Council of Governments, https://www.mwcog.org/uploads/committee-documents/aV1YXFhd20140710114716.pdf, (document download), July 16, 2014

4.1.3 Urban Development Areas (UDA)

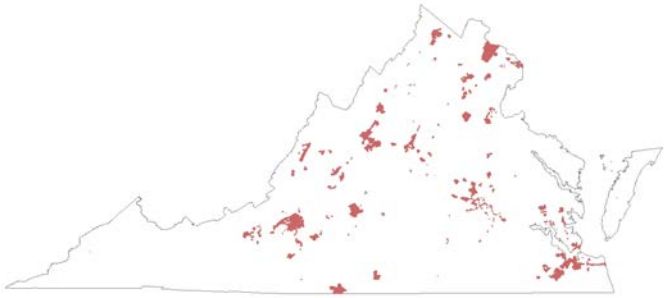
- **Number of UDAs:** 230 UDAs;[1] 535 Industrial and Economic Development Areas (IEDA)[2]

- **Definition:** UDAs are locally-designated growth areas based on local initiatives pursuant to Code of Virginia § 15.2-2223. IEDAs are locally-identified industrial and economic development sites submitted to Virginia Economic Development Partnership's (VEDP) Business Ready Sites Program pursuant to § 2.2-2238.

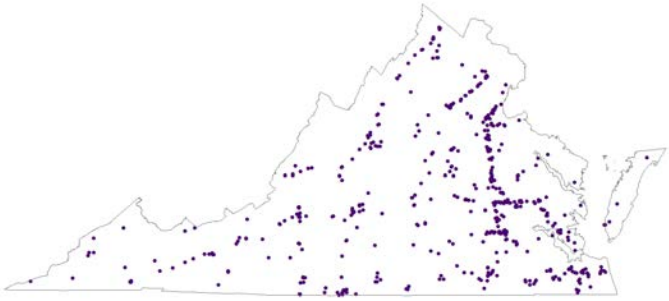
- **Purpose:**
  - The purpose of UDAs is to: (1) support local, walkable places; and, (2) to the extent possible, to direct Federal, State, and local transportation, housing, water and sewer facility, economic development, and other public infrastructure funding to designated UDAs. The purpose of IEDAs is to support economic development.

- **Established:**
  - UDAs are established on an ongoing basis, per local government designation in a locality's Comprehensive Plan pursuant to § 15.2-2223. IEDA's are also established or removed on an ongoing basis.

- **Characteristics of UDAs:**
  - Pedestrian-friendly road design
  - Interconnection of new local streets with existing local streets and roads
  - Connectivity of road and pedestrian networks
  - Preservation of natural areas
  - Mixed-use neighborhoods, including mixed housing types, with affordable housing to meet the projected family income distributions of future residential growth
  - Reduction of front and side yard building setbacks
  - Reduction of subdivision street widths and turning radii at subdivision street intersections



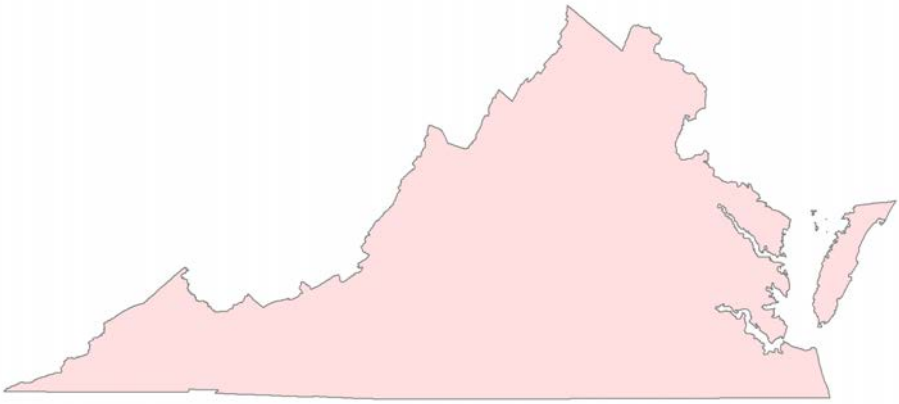
- **Characteristics of IEDAs:**
  - Pursuant to § 2.2-2238 and consistent with VEDP's Business Ready Sites Program (VBRSP)
  - Minimum of 100 contiguous acres (statutory); VEDP accepts sites of 25+ acres
  - Allows for industrial and research parks
  - Applicants to program must be political subdivisions of the Commonwealth of Virginia, including counties, cities, towns, industrial/economic development authorities, and redevelopment and housing authorities or regional industrial facility authorities



[1] As of November 30, 2019
[2] As of November 30, 2019

4.1.4 Safety

- **Definition:** A Safety analysis is conducted for all public roadways in the Commonwealth
- **Established:** The Safety Travel Market was established as part of VTrans2040[1]



[1] Commonwealth Transportation Board, VTrans2040 Virginia's Statewide Multimodal Long-Range Transportation Plan Vision Plan and Needs Assessments, December 9, 2015

4.2 Policy for the Identification of Virginia's Mid-term Transportation Needs

The Policy for the Identification of VTrans Mid-term Needs establishes multimodal need categories that correspond to the Board-adopted VTrans Vision, Goals, and Objectives.[1] Each category has one or more performance measures and thresholds to identify needs.

Table 1 below outlines need categories and corresponding measures and thresholds established per the CTB Policy for the Identification of VTrans Mid-term Needs. Locations where the performance measure exceeds the threshold are designated as VTrans Mid-term Needs. While the policy is outlined here, more detail on methods can be found in the Technical Guide for the Identification and Prioritization of the Mid-term Needs.

The freight issues identified in 4.4 Freight Element, including identified Truck Safety issues and Freight Bottlenecks, may inform future updates to the Board's established Policy for the Identification of Mid-term Needs.

Table 1: VTrans Goals and Associated VTrans Mid-term Needs Categories

Need Category	VTrans Travel Market(s)	Measure and Threshold for Establishing VTrans Mid-term Needs
Goal A: Economic Competitiveness and Prosperity		
Congestion Mitigation	CoSS, RN	At least 2% of the average travel takes place in the excessively congested condition, defined as travel speed below 75% of posted speed limit
	CoSS, RN	Travel Time Index (TTI) 1.3 or higher for at least 3 hours OR 1.5 or higher for at least 1 hour
Improved Reliability (Highway)	CoSS, RN	Level of Travel Time Reliability (LOTTR) 1.5 or higher for at least 1 hour
Improved Reliability (Intercity and Commuter Rail)	COSS	Intercity or commuter rail on-time performance less than 80% at applicable rail stations OR on-time performance less than 90% for applicable rail lines
Goal B: Accessible and Connected Places		
Transit Access to Equity Emphasis Areas	RN	An area with no fixed-route transit service, that has population density to support fixed-route transit service, and that has significantly higher-than-average concentrations of people who are low-income, people with disabilities, minority populations, populations with Limited English Proficiency (LEP), or populations age 75 or higher
Transit Access to Activity Centers	RN	A VTrans Activity Center where the deficit of workers who can access the Activity Center by bus or rail transit within 45 minutes compared to those who can access the Activity Center by automobile within 45 minutes is greater than zero
Pedestrian Access to Activity Centers	RN	1-mile distance from local-serving and knowledge-based Activity Centers, fixed-guideway transit stations, and bus rapid transit (BRT) lines
Bicycle Access to Activity Centers	RN	7-mile distance around local-serving and knowledge-based Activity Centers, fixed-guideway transit stations, and BRT lines

[1] Commonwealth Transportation Board, Actions to Approve the 2019 VTrans Vision, Goals, Objectives, Guiding Principles and the 2019 Mid-term Needs Identification Methodology and Accept the 2019 Mid-term Needs, January 15, 2020.

Need Category	VTrans Travel Market(s)	Measure and Threshold for Establishing VTrans Mid-term Needs
Access to Industrial and Economic Development Areas (IEDAs)	Statewide	Virginia Business Ready Sites Program site with readiness status of Tier 3 or above
Urban Development Areas (UDAs)	UDA[1]	Locality-identified transportation needs for bicycle and pedestrian infrastructure, circulation and access, safety, transit enhancements, and access to locally designated UDAs
Goal C: Safety for All Users		
Roadway Safety	Statewide	For each Construction District, includes VDOT Top 100 Potential for Safety Improvement (PSI) Intersections and Segments, and PSI locations with three or more fatal or injury crashes at the intersection or segment over the last 5 years
Pedestrian Safety	Statewide	Priority corridors identified in VDOT Pedestrian Safety Action Plan[2]
Goal D: Proactive System Management		
Capacity Preservation	CoSS, RN	Inclusion in the VDOT Arterial Preservation Network[3] (the State-maintained portion of the National Highway System, as well as additional highways that facilitate connectivity)
Goal E: Healthy Communities and Sustainable Transportation Communities		
Transportation Demand Management	CoSS, RN	Transportation Demand Management (TDM) needs based on roadway facility type and VTrans Travel Market

4.2.1 Summary of the 2021 VTrans Mid-term Needs Identified based on CTB Policy

InteractVTRANS CTB established a policy to identify the Commonwealth's transportation Mid-term Needs in a transparent, replicable, and data-driven manner. The Commonwealth has over 47,000 directional miles with one or more mid-term transportation needs.

The Mid-term Needs are multimodal, including but not limited to need categories for: roadway congestion, reliability, and safety; passenger rail travel time reliability, transportation demand management, transit access, and transit equity; nonmotorized (bicycle and pedestrian) access; and pedestrian safety.

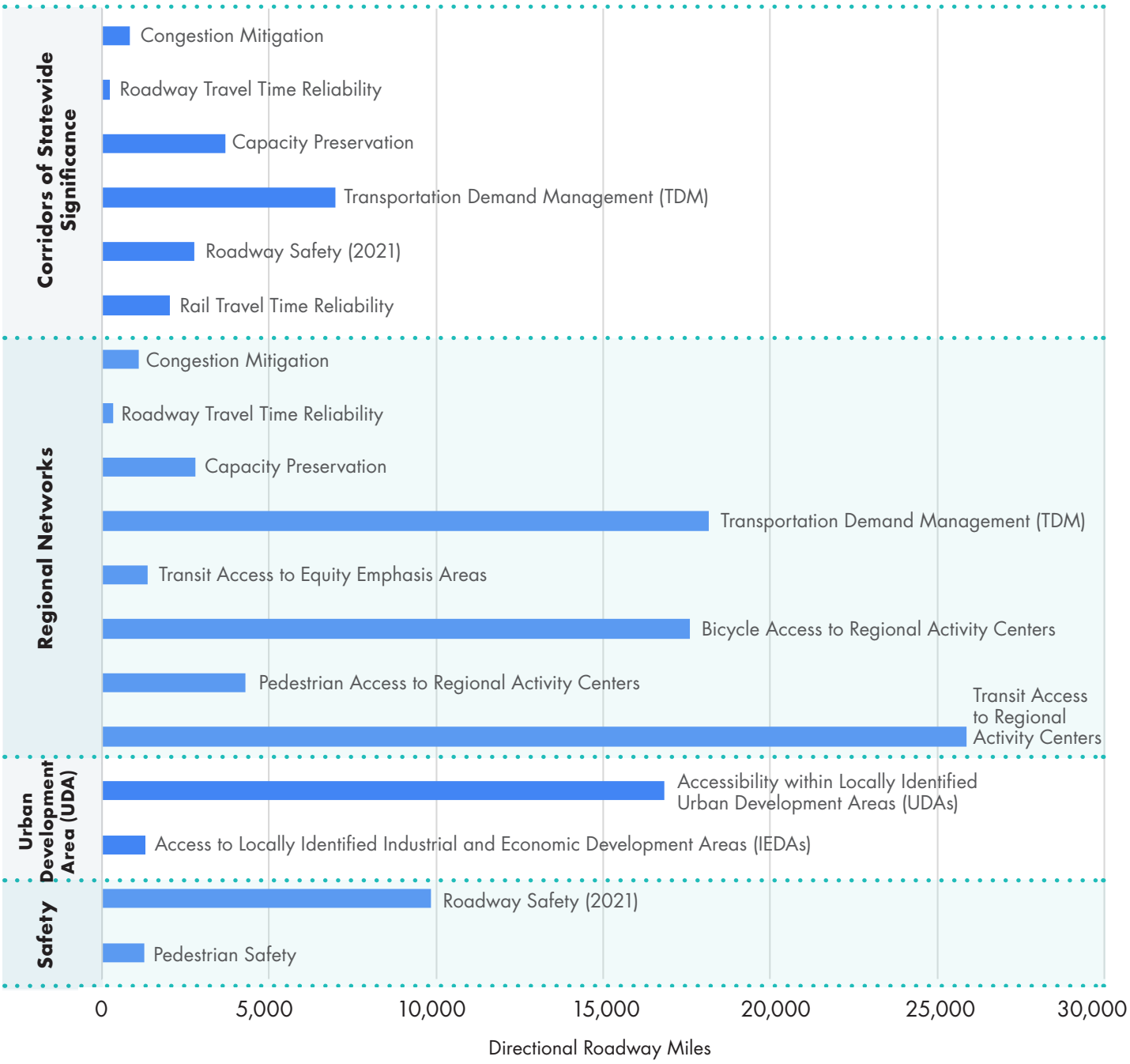
The Mid-term Needs are evaluated across distinct travel markets: Corridors of Statewide Significance (CoSS), Regional Networks (RNs), Urban Development Areas (UDAs), and statewide safety needs as summarized in Figure 3.

[1] Per Code of Virginia § 33.2-353 and § 15.2-2223.1

[2] http://www.virginiadot.org/business/resources/VDOT_PSAP_Report_052118_with_Appendix_A_B_C.pdf

[3] VDOT Arterial Preservation Program Network

Figure 3: VTrans Mid-term Needs



4.2.2 Interpretation of the 2021 VTrans Mid-term Needs Identified based on CTB Policy

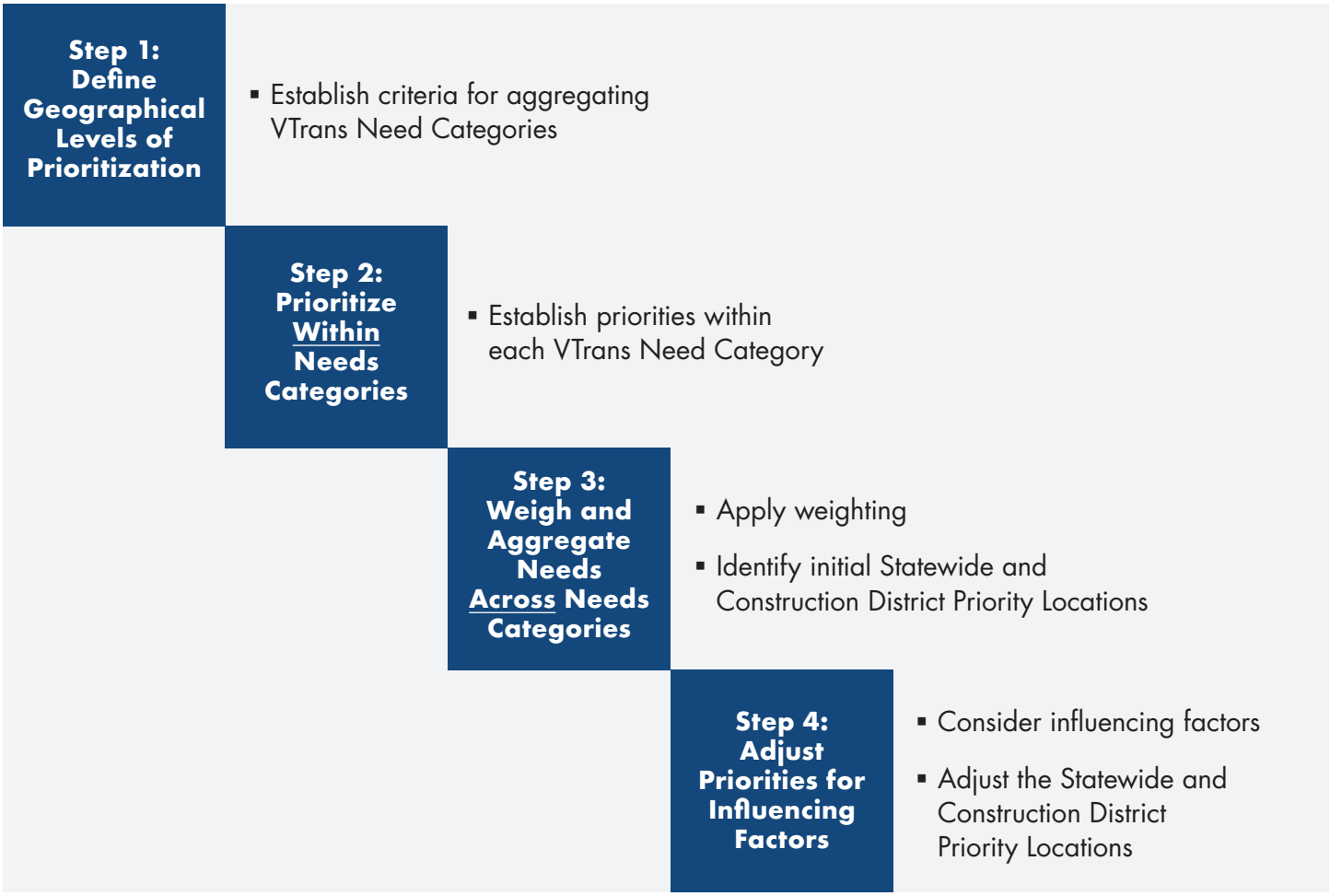
Identified needs or underlying issues are assigned to roadway segments or nodes for geographical precision. They should be interpreted in the following manner:

- A solution does not have to be co-located with a need as long as the purpose and effectiveness of a solution addresses the underlying VTrans Mid-term Need.
- A VTrans Need Category does not specify a type or mode of response. For example, a solution to a Need for Improved Reliability may not be roadway-centric and can instead be addressed by multimodal infrastructure improvements such as transit or rail services or park-and-ride infrastructure. Similarly, a Need for Improved Reliability may also be addressed by policies (e.g., variable pricing, occupancy or vehicle restrictions, etc.) or programs such as commuter assistance programs.

4.3 Policy for the Prioritization of Virginia's Mid-term Transportation Needs

The Policy for the Prioritization of the VTrans Mid-term Needs[1] is conducted in four steps shown in Figure 4 and described in greater detail below. Prioritization is conducted in four steps as shown in Figure 4 below.

Figure 4: Steps for Prioritization of the VTrans Mid-term Needs



- Step 1: Two sets of priorities are established: Statewide Priority Locations and VDOT Construction District Priority Locations for each of the nine Districts. Each relies on different Need Categories and Travel Markets per Table 2.
- Step 2: The severity of a need and the magnitude of the impact of the need are used to categorize the Board-adopted 2019 VTrans Mid-term Needs as very high, high, medium, and low.
- Step 3: The categorized needs are weighted to determine a location- or roadway segment-specific weighted score.
- Step 4: The results from step 3 are adjusted to consider important factors affecting the transportation network, and then the locations are categorized as Statewide Priority 1, Priority 2, Priority 3, or Priority 4, or District Priority 1, Priority 2, Priority 3, or Priority 4.

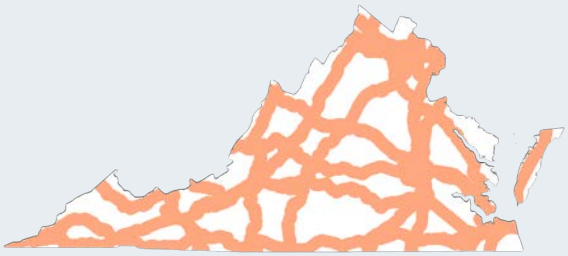
While the policy is outlined here, more detail on methods can be found in the Technical Guide for the Identification and Prioritization of the Mid-term Needs.

[1] Commonwealth Transportation Board, Actions to Approve the Policy for the Prioritization of the VTrans Mid-term Transportation Needs and Accept the Prioritized 2019 VTrans Mid term Needs, March 17, 2021.

4.3.1 Step 1: Define Geographical Levels of Prioritization

Two sets of Priority Locations are established – Statewide Priority Locations and Construction District Priority Locations. Each relies on different Need Categories and Travel Markets per Table 2.

Table 2: Geographical Levels of Prioritization and Applicable Travel Markets

Levels of Prioritization	Statewide Priority Locations	Construction District Priority Locations
Aggregation Level	Statewide: Corridors of Statewide Significance 	VDOT Construction District
Applicable Need Categories	▪ Congestion Mitigation (CoSS) ▪ Improved Reliability (Highway) (CoSS) ▪ Improved Reliability (Intercity and Commuter Rail) (CoSS) ▪ Roadway Safety (along CoSS) ▪ Capacity Preservation (CoSS) ▪ Transportation Demand Management (CoSS)	▪ Congestion Mitigation (RN) ▪ Improved Reliability (Highway) (RN) ▪ Transit Access to Equity Emphasis Areas (RN) ▪ Transit Access to Activity Centers (RN) ▪ Pedestrian Access to Activity Centers (RN) ▪ Bicycle Access to Activity Centers (RN) ▪ Access to Industrial and Economic Development Areas (IEDA) ▪ Roadway Safety (Segments and Intersections) ▪ Safety (Pedestrian Safety) ▪ Capacity Preservation (CoSS, RN) ▪ Transportation Demand Management (RN)

4.3.2 Step 2: Prioritize Within VTrans Mid-term Need Categories

The second step establishes priorities as very high, high, medium, or low within each VTrans Mid-term Need Category per the following:[1]

- Very High Priority: Top 5% of the total mileage of the applicable needs
- High Priority: Top 5.001%–15% of the total mileage
- Medium Priority: Top 15.001%–25% of the total mileage
- Low Priority: Bottom 25.001%–100% of the total mileage

The above-referenced priorities within each VTrans Mid-term Need Category are categorized based on the following two criteria:

- Severity of the Need: takes into account the intensity or extremity of the need.
- Magnitude of the Need: takes into account the number of residents, vehicles, or persons impacted by the need.

These criteria are explained in more detail in the Technical Guide for the Identification and Prioritization of VTrans Mid-term Needs.[2]

[1] Limitations of the existing datasets as well as the need to avoid small fractional distributions of the needs have required utilization of non-percentile based distribution or prioritization within VTrans Mid-term Needs. These are outlined in more detail in the Technical Guide for the Identification and Prioritization of the VTrans Mid-term Needs.

[2] OIPI, Technical Guide for the Identification and Prioritization of VTrans Mid-term Needs, 2021.

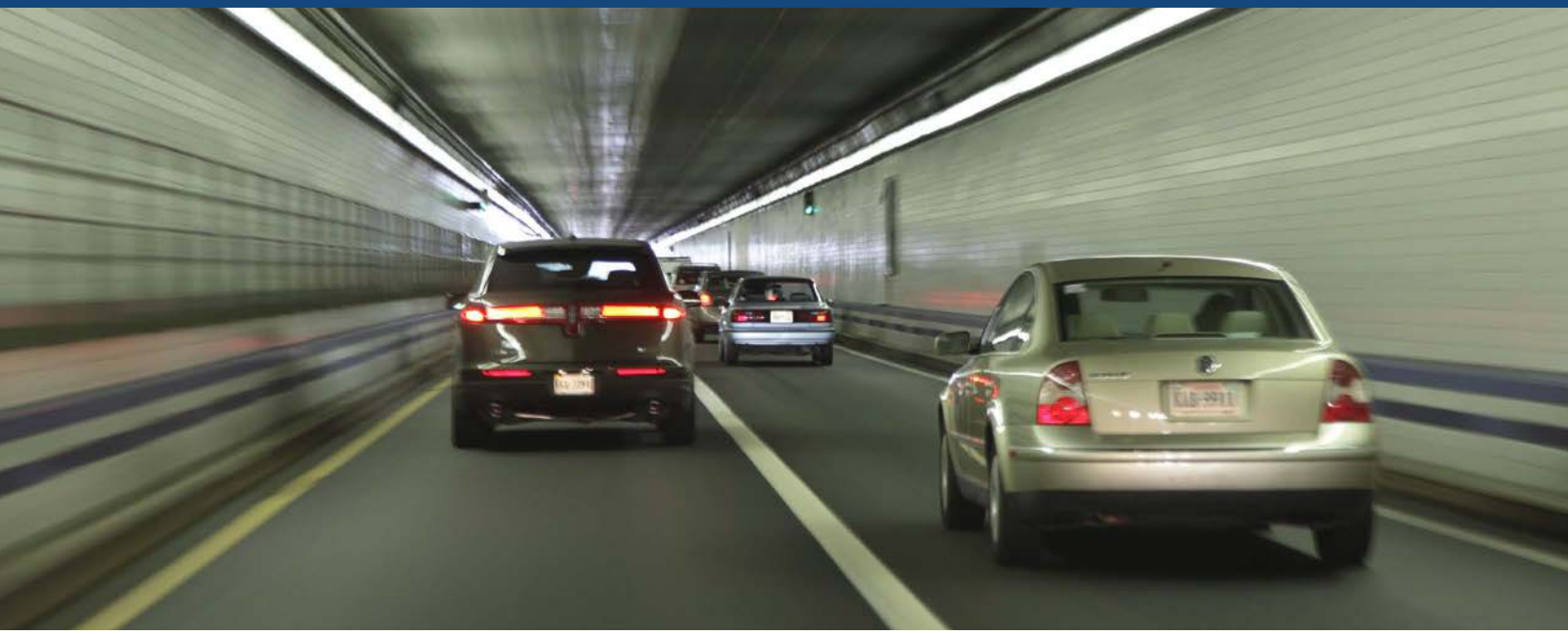
4.3.3 Step 3: Weigh and Aggregate VTrans Mid-term Needs Across Needs Categories

The third step takes the VTrans Mid-term Needs as categorized above, weights and aggregates them to form a location- or roadway segment-specific score. Weighting for Construction District Priority Locations is based on SMART SCALE Area Types.[1]

Table 3: Weighting to Establish Statewide and Construction District Priority Locations

Travel Market	Board-adopted VTrans Need Category	Weighting – Statewide Priority	Weighting – Construction District Priority[1]			
			Area Type A	Area Type B	Area Type C	Area Type D
CoSS	Congestion Mitigation	25.00%	These Need Categories are not utilized for establishing Construction District Priority Locations.			
CoSS	Improved Reliability (Highway)	15.00%				
CoSS	Improved Reliability (Intercity and Commuter Rail)	10.00%				
Safety	Roadway Safety (along CoSS)	25.00%				
CoSS	Capacity Preservation	10.00%				
CoSS	Transportation Demand Management	15.00%				
RN	Congestion Mitigation	These Need Categories are not utilized for establishing Statewide Priority Locations.	25.00%	15.00%	10.00%	5.00%
RN	Improved Reliability (Highway)		20.00%	10.00%	5.00%	5.00%
RN	Transit Access to Equity Emphasis Areas		5.00%	6.25%	6.25%	3.75%
RN	Transit Access to Activity Centers		5.00%	6.25%	6.25%	3.75%
RN	Pedestrian Access to Activity Centers		5.00%	6.25%	6.25%	3.75%
RN	Bicycle Access to Activity Centers		5.00%	6.25%	6.25%	3.75%
UDA	Access to Industrial and Economic Development Areas		2.50%	10.00%	10.00%	15.00%
Safety	Roadway Safety		15.00%	15.00%	20.00%	25.00%
Safety	Pedestrian Safety		5.00%	5.00%	5.00%	5.00%
CoSS, RN	Capacity Preservation		2.50%	10.00%	15.00%	20.00%
RN	Transportation Demand Management		10.00%	10.00%	10.00%	10.00%
	Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

[1] Commonwealth Transportation Board. Adoption of Updated Policy for Implementation of the SMART SCALE Project Prioritization Process. February 19, 2020.



4.3.4 Step 4: Adjust Priorities for Influencing Factors

The final step is to adjust the scores determined in step 3 in light of factors affecting the transportation network that may be important to take into account. Presence or absence of these factors will not cause a location to be assigned a lower priority level than assigned in step 3; they can only increase a location's priority level.

- Co-located bridge repair, rehabilitation, or replacement needs
- Co-located pavement repair, rehabilitation, or replacement needs
- Exposure to projected sea level rise, storm surge, or historical inland/riverine flooding
- Co-located Economically Distressed Communties[1]

Adjustments are made for each location from step 3 based on the level of the applicable influencing factor criteria.

4.3.5 Summary of the 2019 VTrans Mid-term Needs Prioritized based on CTB Policy

The final adjusted Statewide Priority Locations and Construction District Priority Locations are then established as follows:

Statewide Priority Locations are assigned levels 1–4 based on their relative statewide rank by roadway segment mileage in the following manner:

- Priority 1 Locations: Top 0%–1% of the total mileage
- Priority 2 Locations: 1.001%–5% of the total mileage
- Priority 3 Locations: 5.001%–15% of the total mileage
- Priority 4 Locations: Bottom 15.001%–100% of the total mileage

Construction District Priority Locations are assigned levels 1–4 based on their relative rank for each VDOT Construction District by roadway segment mileage in the following manner:

- Priority 1 Locations: Top 0%–1% of the total mileage
- Priority 2 Locations: 1.001%–5% of the total mileage
- Priority 3 Locations: 5.001%–15% of the total mileage
- Priority 4 Locations: Bottom 15.001%–100% of the total mileage

[1] Source: Economic Innovation Group's Distressed Communities Index, https://eig.org/dci. See map at www.vtrans.org/interactvtrans.

CTB established a policy to prioritize the Commonwealth's transportation Mid-term Needs in a transparent, replicable, and data-driven manner. The Mid-term Needs are prioritized at both the VDOT Construction District and Statewide levels as summarized below.

Figure 5: VDOT Construction District Priority Locations (Directional Roadway Miles)

All transportation needs are aggregated and prioritized to establish priority locations for each of the nine VDOT Construction Districts.

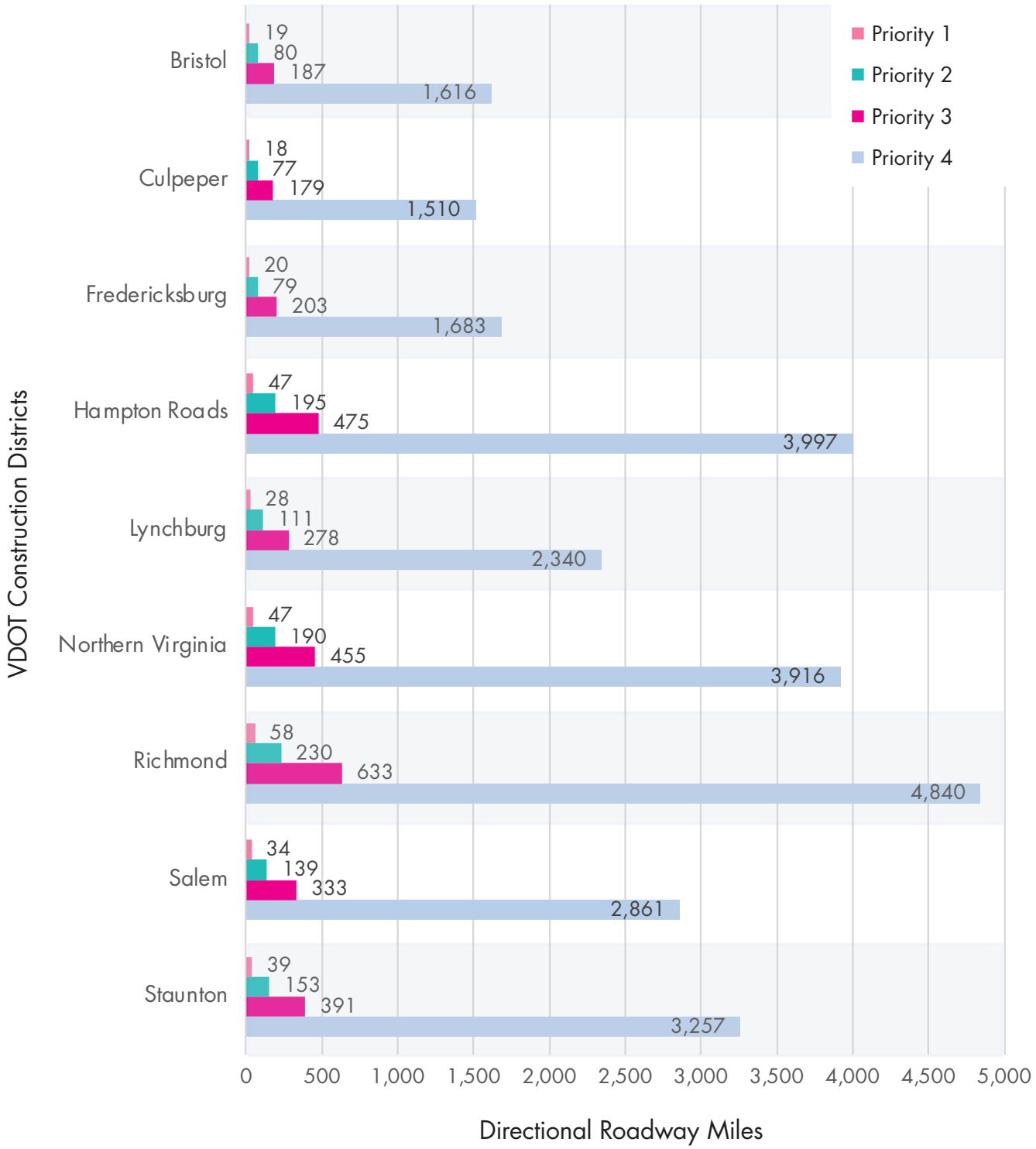
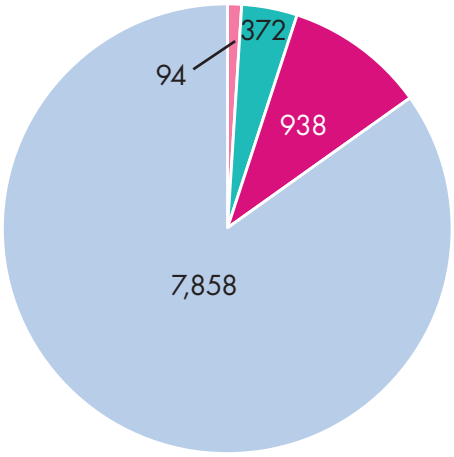


Figure 6: Statewide Transportation Priority Locations (Directional Roadway Miles)

These locations directly or indirectly advance economic prosperity and vitality for the entire State.



- Priority 1 Locations: Top 0%–1% of the total mileage
  Virginia is actively working with localities to identify solutions for Priority 1 transportation needs
- Priority 2 Locations: 1.001%–5% of the total mileage
  Virginia is actively working with localities to identify solutions for Priority 2 transportation needs
- Priority 3 Locations: 5.001%–15% of the total mileage
- Priority 4 Locations: Bottom 15.001%–100% of the total mileage

4.3.6 Interpretation of the 2019 VTrans Mid-term Needs Prioritized based on CTB Policy

Per Board policy, the prioritized Mid-term Needs inform decisions on corridor studies and project development activities, including studies that evaluate freight and related improvements.

Prioritized needs are location-specific for geographical precision. They should be interpreted in the following manner:

- A solution does not have to be co-located with a prioritized need as long as the purpose and effectiveness of a solution addresses the underlying issue(s).
- A VTrans Need Category does not specify a mode-specific response. For example, a solution to a Need for Improved Reliability may not be roadway-centric and can instead be addressed by multimodal infrastructure improvements such as transit or rail services or park-and-ride infrastructure. Similarly, a Need for Improved Reliability may also be addressed by policies (e.g., variable pricing, occupancy or vehicle restrictions, etc.) or programs such as commuter assistance programs.

4.4. Freight Element (Developed Pursuant to 49 USC 70202: State Freight Plans)

4.4.1 Approach to Freight Element

The development of the Freight Element is performed to ensure that VTrans, as the State Transportation Plan, meets requirements of 49 U.S.C. § 70202 FAST Act State Freight Plans. Virginia has relied on integration of modal planning processes allowing VTrans to include Virginia's Freight Element ,pursuant to 49 U.S.C. § 70202.

Virginia has relied on integration of modal planning processes allowing VTrans, Virginia's Transportation Plan, to include Virginia's Freight Element pursuant to 49 U.S.C. § 70202. The trends, issues, and strategic actions identified through the Freight Element are integrated with ongoing performance monitoring activities, the implementation of adopted Board policy, and consideration of future enhancements to Board policy.

The Freight Element provides a cohesive planning approach, which relies on the VTrans Mid-term Needs as a common base from which to identify freight-specific issues that may also address the underlying need. VTrans, as the State Transportation Plan, includes a Freight Element which reflects how freight considerations are already included in decision making through established Board policies. Additional references to ongoing monitoring activities are included in Appendix E: System Performance Report, which provides a mechanism for continued monitoring of Freight Bottlenecks identified in the Freight Element.

The technical approaches and identified issues, such as identified Truck Safety and Freight Bottlenecks (see Section 4.4.5.1 Highway Network Safety, Congestion, and Reliability) will be considered for incorporation and future modifications to the Board's policy for identification and prioritization of Mid-term Needs (see Sections 4.2 and 4.3).

This section includes discussion of key aspects of the Freight Element, including the designation of critical freight corridors, inventory of existing freight facilities, identification of freight issues, and strategic actions relevant to freight. Additionally, this section and supporting appendices provide access to digital tools and datasets, and document the methods and techniques used to develop performance measures to ensure replicability.

4.4.2 Critical Rural and Urban Freight Corridors

As required by 23 U.S.C § 167(g) and other pertinent Federal regulations, tables are provided in Appendix B which identify critical freight corridors in accordance with current guidance from the Federal Highway Administration (FHWA) covering the designation and certification requirements.

InteractVTRANS The designated corridors were developed in coordination with multiple State agencies, MPOs, and other stakeholders in the Commonwealth and are available for review on InteractVTrans. See Appendix B: Critical Freight Corridor Designation for summary tables of designated corridors submitted to FHWA.

4.4.3 Inventory of Existing Freight Facilities

Virginia's freight network is inclusive of highway, rail, ports and waterways, and airports across the Commonwealth. Table 4 provides an inventory of existing freight system assets and committed projects and studies available on InteractVTrans.

Table 4: Freight Element Layers available on InteractVTrans

Layer Group/ Layer Name	Layer Description	Data Description	Layer Link
VTrans Travel Markets			
CoSS Roadway Components	Roadway segments designated as CoSS primary facilities and major roadway components (i.e., parallel facilities)	Includes route name, direction, functional classification, limited access facilities, and AADT	https://tinyurl.com/bp9cmj3b
CoSS Rail Components	Rail segments of the CoSS	Includes the railroad owner, CoSS component assets, CoSS component services, and CoSS name	https://tinyurl.com/2p8fe7wz
CoSS Intermodal Components	Polygons for the port facilities, airports, and river components of the CoSS	Includes component asset name and associated CoSS name	https://tinyurl.com/2p8kjnvy
Committed Projects and Studies			
Six-Year Improvement Program	Points and lines of committed projects in Virginia's Six-Year Improvement Program	Includes project description, scope of work, cost estimate, and funding allocation	https://tinyurl.com/4tx94482
STARS Studies	Strategically Targeted Affordable Roadway Solutions (STARS) study locations	Includes project purpose, study area, and jurisdiction	https://tinyurl.com/4ncf5dny
Arterial Management Plans	Arterial Management Plan study locations	Includes route name and plan name	https://tinyurl.com/y2s4j8na
Multimodal Facilities			
Rail Lines	All rail lines in Virginia	Includes railroad owner, railroad type, and passenger service availability	https://tinyurl.com/b4ydu9wv
Intermodal Facilities			
Marine and Inland Ports	Point locations of marine and inland ports in Virginia	Includes facility name and associated CoSS	https://tinyurl.com/9m2ww28r
Airports	Commercial service and general aviation airports	Includes airport name, ID, and type	https://tinyurl.com/ykheryry
Vehicle Restrictions	Restricted Truck Routes	Includes vehicle restriction type	https://tinyurl.com/46w9y5vs
Freight			
Critical Urban and Rural Freight Corridors	Designated Critical Freight Corridors	Includes route name, direction, and designating entity	https://tinyurl.com/3jatb58v

4.4.4 Commodity Flows to and from Maritime Facilities, Warehouses, and Distribution Centers

The review of freight commodity flows provides key context for understanding where freight movements are occurring on the transportation network today and where additional demands are expected into the future. Commodity flow data from multiple sources were analyzed in development of the VTrans Freight Element, and made publicly available through interactive mapping applications.

An understanding of freight commodity flows provides key context for the type and location of freight movements on the transportation network today and where additional demands are expected into the future.

4.4.4.1 Top 10 Commodities Originating and Terminating in Virginia

The types of commodities moving within and through Virginia is an important consideration relative to the transportation modes available for freight movements and impacts on the system. Discussion of the opportunity for increased modal efficiencies is included in 4.4.5.3. Figure 7 depicts the Top 10 Commodities Originating in Virginia by Tonnage, while Figure 8 depicts the Top 10 Commodities Terminating in Virginia.

Figure 7: Top 10 Commodities Originating in Virginia by Tonnage

	2012	2017	2030
1	Nonmetallic Minerals	Nonmetallic Minerals	Nonmetallic Minerals
2	Petroleum or Coal Products	Food or Kindred Products	Food or Kindred Products
3	Food or Kindred Products	Farm Products	Scrap Metal
4	Clay, Concrete, Stone, Glass	Scrap Metal	Farm Products
5	Lumber or Wood	Clay, Concrete, Stone, Glass	Clay, Concrete, Stone, Glass
6	Scrap Metal	Lumber or Wood	Petroleum or Coal Products
7	Farm Products	Petroleum or Coal Products	Lumber or Wood
8	Chemicals	Chemicals	Chemicals
9	Paper	Rubber	Rubber
10	Transportation Equipment	Fabricated Metal	Fabricated Metal

Size of bar indicates value relative to others within the same column
Source: Transearch, 2017

Figure 8: Top 10 Commodities Terminating in Virginia by Tonnage

	2012	2017	2030
1	Nonmetallic Minerals	Nonmetallic Minerals	Nonmetallic Minerals
2	Petroleum or Coal Products	Food or Kindred Products	Food or Kindred Products
3	Food or Kindred Products	Farm Products	Farm Products
4	Farm Products	Petroleum or Coal Products	Petroleum or Coal Products
5	Clay, Concrete, Stone, Glass	Clay, Concrete, Stone, Glass	Scrap Metal
6	Scrap Metal	Scrap Metal	Clay, Concrete, Stone, Glass
7	Lumber or Wood	Lumber or Wood	Chemicals
8	Chemicals	Chemicals	Lumber or Wood
9	Paper	Transportation Equipment	Transportation Equipment
10	Metal	Paper	Paper

Size of bar indicates value relative to others within the same column. Source: Transearch, 2017
Military freight movement considerations are reflected in project planning activities conducted in Virginia. For example, Hampton Roads Bridge Tunnel expansion, the largest transportation project in Virginia, considered military readiness. Please refer the purpose and need statement of this project includes improving strategic military connectivity. The statement is available here - https://www.hrbtexpansion.org/documents/2017/hrcs_fseis_chpt_1.pdf.

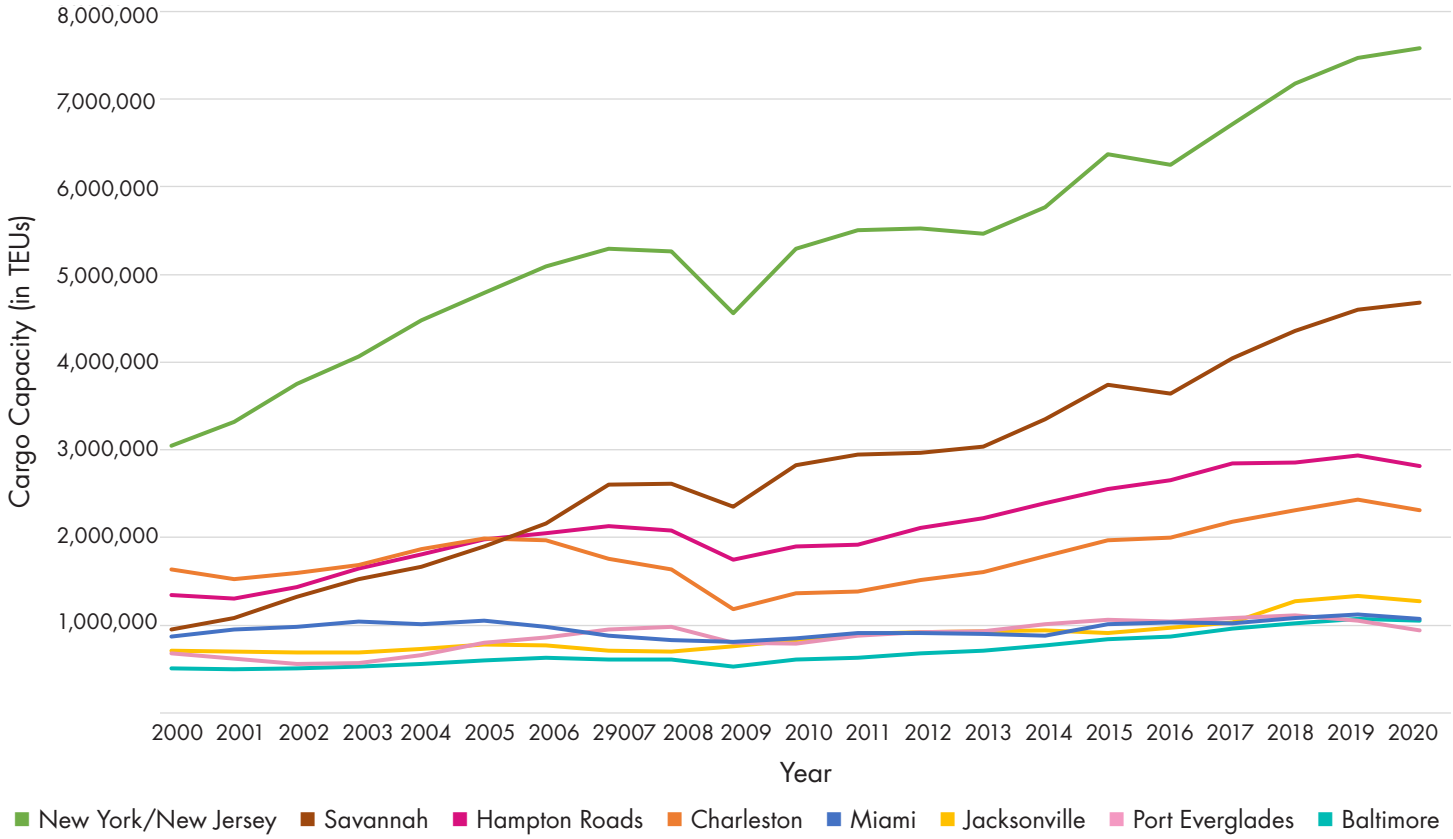
4.4.4.2 Commodity Flow to and from Maritime Facilities

The Port of Virginia is one of the Nation's leading seaports, consisting of an inland intermodal ramp (Virginia Inland Port), an upriver barge terminal (Richmond Marine Terminal), and four deep-water marine terminals: Norfolk International Terminals, Newport News Marine Terminal, Virginia International Gateway, and Portsmouth Marine Terminal.

The Port of Virginia's facilities are key origin and destination points for commodity flows, and critical nodes of concentrated freight activity on the transportation network.

The Port of Virginia's facilities are key origin and destination nodes for commodity flows. Compared to passenger vehicles, commodity movements have fewer trip generation and destination points, therefore truck volumes tend to be more concentrated in or around certain facilities. As the third largest by container volume among Atlantic Coast seaports, the Port of Virginia is an increasingly major driver of truck trip generation in the Commonwealth and beyond as evidenced by Figure 9 below.

Figure 9: Annual Twenty-foot Equivalent Units (TEUs)* for Select Atlantic Coast Seaports



Source: American Association of Port Authorities; individual ports.
*Note: A TEU or Twenty-foot Equivalent Unit is an exact unit used to measure cargo capacity for container ships and container terminals.

It is important to note that Virginia's rail mode share at the Port of Virginia sets the Commonwealth apart and helps guard Virginia against bottlenecks. Investments in freight rail to support the Port are aligned with many VTrans Guiding Principles, Goals, and Objectives and the Port of Virginia sees small intermodal facilities for rail as a top investment for the Port.

The Virginia Department of Rail and Public Transportation is working on a Federal Railroad Administration (FRA)-compliant statewide rail plan that addresses project-specific issues in greater detail.

I-64, a major route between Richmond and Norfolk, VA links Port of Virginia facilities to the I-95 Route, a vital East Coast lifeline for passengers and freight. The Maritime Administration (MARAD) has identified Marine Highway M-64 which includes Hampton Roads, the Chesapeake Bay, James River, and connecting commercial navigation channels, ports, and harbors. It includes southeast Virginia from Norfolk, VA to Richmond, VA and connects to the M-95 Route at Norfolk, VA. These factors, combined with anticipated increases in port trade, are placing an increasing demand on the landside section

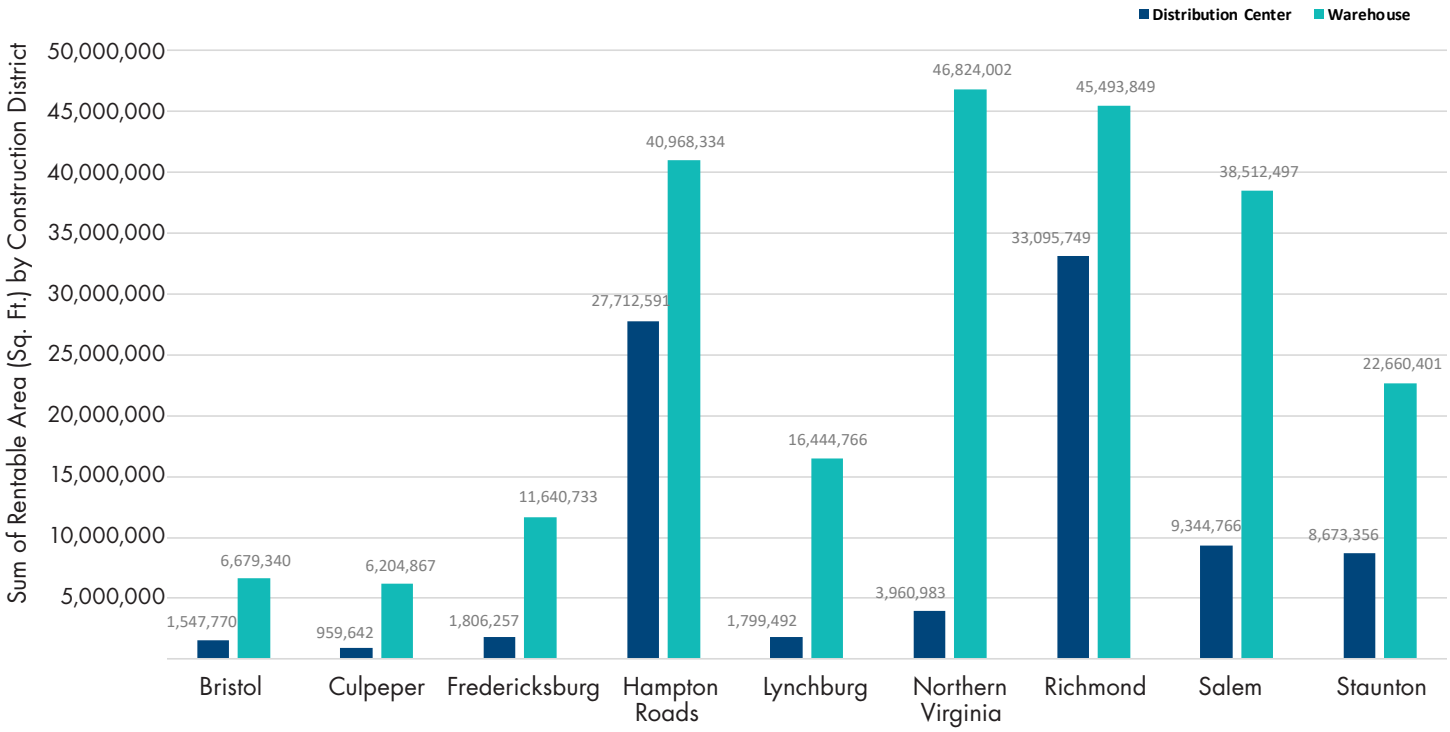
of I-64. The water option, which consists mainly of the James River, has considerable capacity to expand. An ongoing marine highway service that began in 2008 is one example of the potential this route can offer. While the service's volumes continue to grow, this and other Marine Highway operations face various challenges in realizing the additional potential of this alternative. The M-64 Marine Highway James River barge service has expanded over the past few years and has generated some efficiency benefits and savings for both agencies responsible for surface transportation and the Port of Virginia.

4.4.4.3 Commodity Flow to and from Warehouse and Distribution Centers

Truck trip generation and truck volumes also tend to be more concentrated in or around warehousing and distribution center facilities. As demonstrated in Figure 10 below, warehouse and distribution centers impact the transportation system of every VDOT Construction District, with heavy concentrations in Hampton Roads, Northern Virginia, Richmond, and Salem Districts.

Warehouse and distribution centers are critical nodes of freight activity and are growing in importance for all areas of the Commonwealth from both the economic development and transportation infrastructure perspectives.

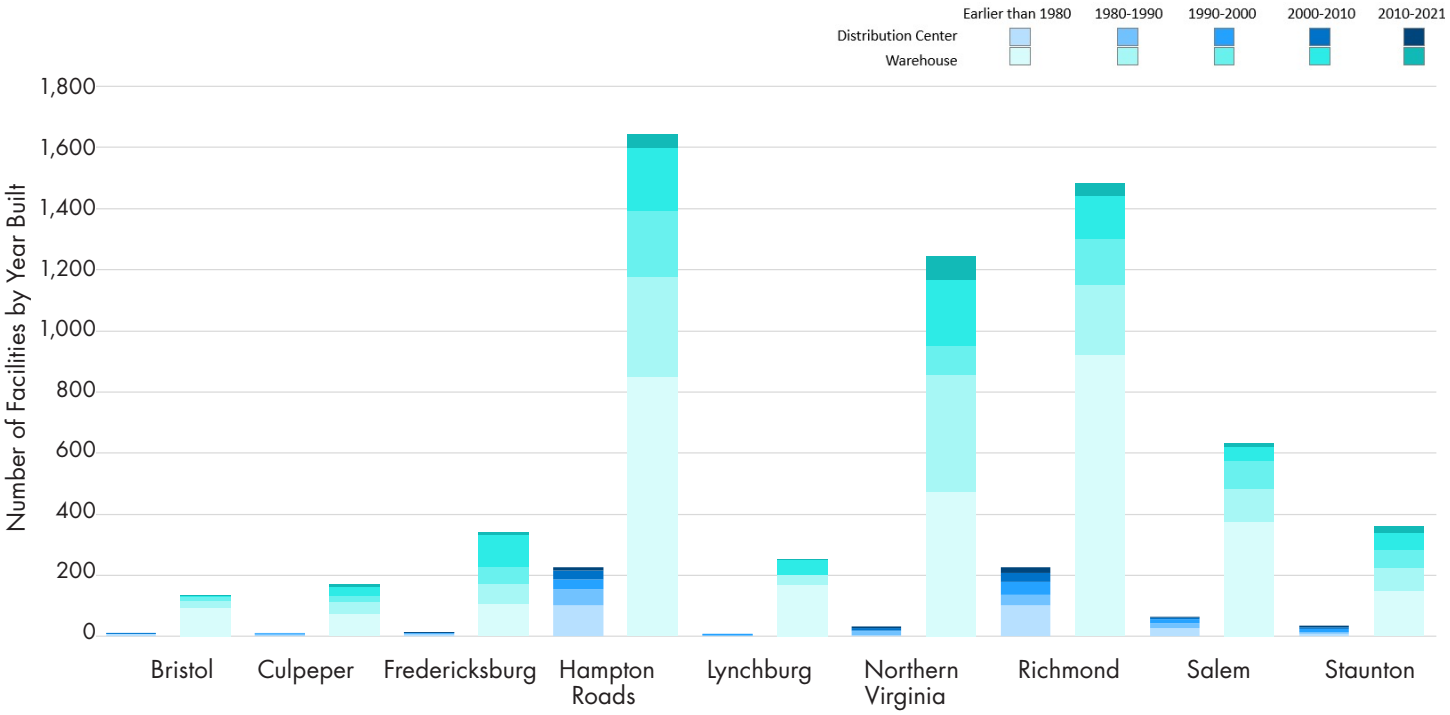
Figure 10: Total Rentable Area of Warehouse and Distribution Centers by VDOT Construction District



Source: CoStar, 2021. Notes: For existing facilities only. Summary by construction districts may reflect partial data.

As depicted in Figure 11, with the rise of e-commerce, the growth in the number of facilities over the last few decades is predominantly in distribution center space rather than warehousing. This trend and considerations of future transportation system impacts of distribution centers is a macrotrend explored in Section 5 of this report.

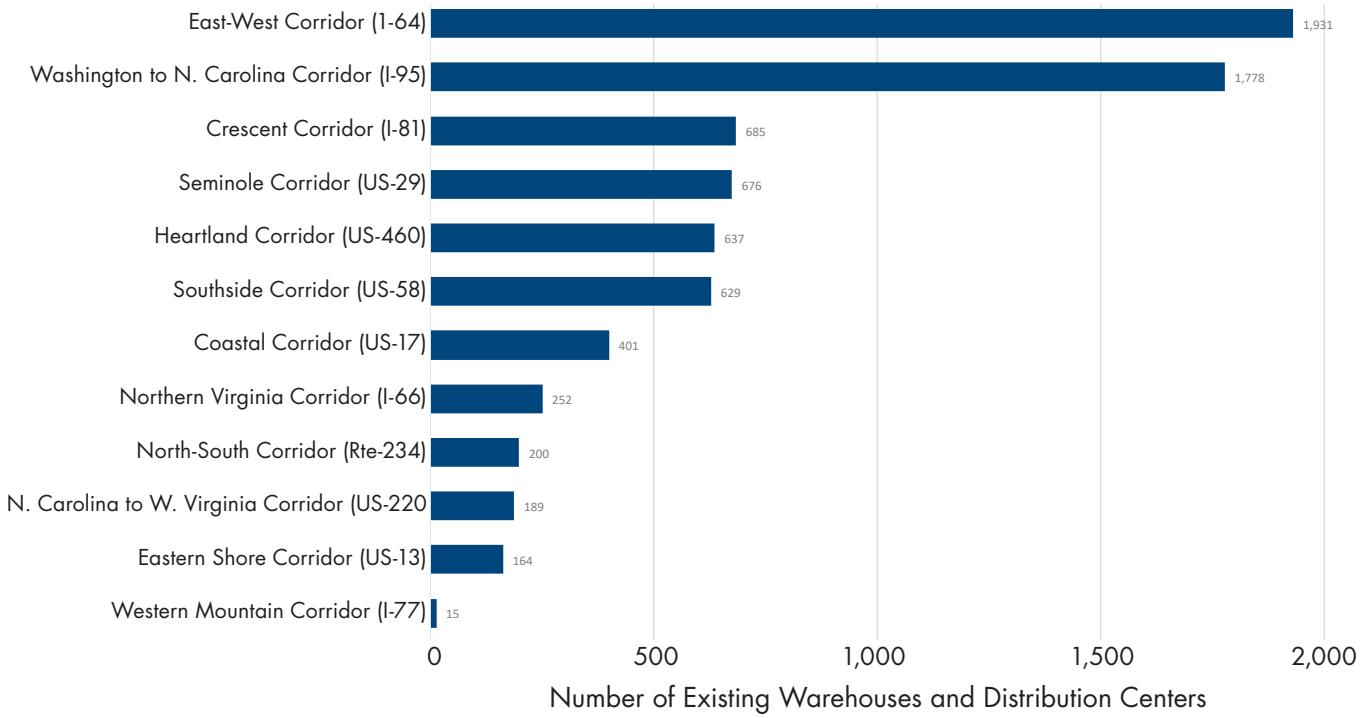
Figure 11: Number of Facilities by Year Built in Each VDOT Construction District



Source: CoStar. Notes: For existing facilities only. Summary by construction districts may reflect partial data.

Truck trips and volumes generally move within and through the Commonwealth on key corridors, including those identified as Corridors of Statewide Significance as defined in Section 4.1 Policy for the Identification of VTrans Travel Markets. Figure 12 below demonstrates the concentration of warehouse and distribution centers by the nearest designated CoSS.

Figure 12: Number of Warehouse and Distribution Center Facilities by closest Corridor of Statewide Significance



Source: CoStar. Notes: Summary by construction districts may reflect partial data.

4.4.4.4 Commodity Flow Summary

Growth in freight trip generation from major maritime facilities, warehouses, and distribution centers is also indicated by the commodity flows between regions of Virginia.

Growth in commodity flows are anticipated throughout the Commonwealth, with the locations of concentrated warehousing and distribution centers and maritime facilities expected to have the highest rates of growth in tonnage.

Table 5: Commodity Flows within Virginia by Destination illustrates that primary population centers (Northern Virginia Construction District), locations of concentrated warehousing and distribution centers (Richmond Construction District), and locations of maritime facilities (Hampton Roads Construction District) are receiving a majority of freight tonnage. This trend is expected to continue into the future, as the highest growth rates of inbound commodity flows are also expected in these Districts.

Table 5: Commodity Flows within Virginia by Destination

Construction District	Commodity Flow (Tonnage) by Year				Observed or Projected Annualized Growth in Commodity Flow (Tonnage)		
	2012	2017	2030	2045	2012-2017	2017-2030	2017-2045
Bristol	9,136,768	4,596,211	4,747,471	5,772,020	-12.8%	0.2%	0.8%
Culpeper	6,054,836	5,324,334	6,802,807	9,858,044	-2.5%	1.9%	2.2%
Fredericksburg	7,682,323	5,730,743	7,458,117	10,928,211	-5.7%	2.0%	2.3%
Hampton Roads	31,166,882	21,399,490	29,265,657	45,880,463	-7.2%	2.4%	2.8%
Lynchburg	9,032,435	7,607,740	9,730,402	12,949,963	-3.4%	1.9%	1.9%
Northern Virginia	33,724,730	31,324,228	41,522,633	61,177,061	-1.5%	2.2%	2.4%
Richmond	28,232,039	25,445,786	33,668,471	48,967,364	-2.1%	2.2%	2.4%
Salem	15,746,328	9,542,452	10,871,690	13,896,671	-9.5%	1.0%	1.4%
Staunton	11,112,947	10,311,533	12,790,601	16,474,559	-1.5%	1.7%	1.7%
Virginia	117,428,561	89,950,194	115,791,885	164,562,636	-5.2%	2.0%	2.2%

Source: Transearch, 2017
Size of bar indicates value relative to others within the same column

As shown in Table 6: Commodity Flows within Virginia by Origin, the overwhelming majority of outbound freight generation is connected to locations of maritime facilities (Hampton Roads Construction District), and the growth rate associated with commodity flows from the port facilities far outpaces all other Construction Districts into the future. Again, concentrations of population, and warehousing and distribution centers are indicated by outbound commodity flow tonnage and growth rates.

Table 6: Commodity Flows within Virginia by Origin

Construction District	Commodity Flow (Tonnage) by Year				Observed or Projected Annualized Growth in Commodity Flow (Tonnage)		
	2012	2017	2030	2045	2012-2017	2017-2030	2017-2045
Bristol	14,444,664	8,211,027	7,632,446	8,615,151	-10.7%	-0.6%	0.2%
Culpeper	8,439,698	10,115,000	8,938,531	9,933,365	3.7%	-0.9%	-0.1%
Fredericksburg	9,845,329	8,374,524	9,099,659	11,955,375	-3.2%	0.6%	1.3%
Hampton Roads	24,203,090	24,329,179	41,069,328	77,259,468	0.1%	4.1%	4.2%
Lynchburg	10,361,822	7,529,248	8,560,794	10,350,714	-6.2%	1.0%	1.1%
Northern Virginia	18,154,497	16,217,888	19,609,252	24,507,113	-2.2%	1.5%	1.5%
Richmond	23,642,786	14,757,715	14,801,444	16,717,527	-9.0%	0.0%	0.4%
Salem	16,692,088	9,184,425	10,920,163	14,110,734	-11.3%	1.3%	1.5%
Staunton	16,993,158	14,053,712	17,402,000	22,228,967	-3.7%	1.7%	1.7%
Virginia	108,316,405	81,440,394	96,967,653	134,336,693	-5.5%	1.4%	1.8%

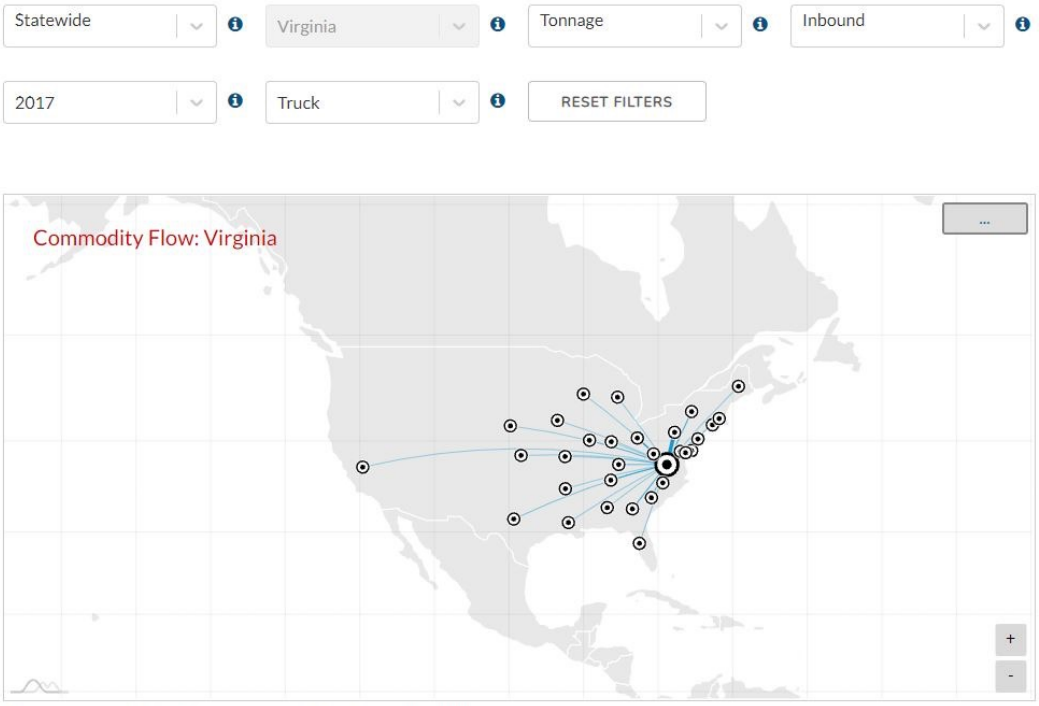
Source: Transearch, 2017
Size of bar indicates value relative to others within the same column

The proceeding sections provided a summary of key findings related to commodity flows; however, additional tools and resources are available. Additional analysis of commodity flows (freight movement) to and from areas in Virginia have been developed and displayed in interactive mapping applications. The mapping tool displays origins and destinations for freight by overall tonnage for the Commonwealth as a whole, as well as for individual VDOT Construction Districts, Planning District Commissions (PDCs), and Metropolitan Planning Organizations (MPOs).

Additional tools and resources to further explore commodity flows to and from the Commonwealth are available at https://vtrans.org/mid-term-planning/freight-plan.

The mapping tool is complemented by word cloud graphics showing the types of freight that are included in the data shown in the commodity flows (freight origin and destination) mapping tool. The word clouds depict the relative amounts of different commodity types.

Figure 13: Freight Commodity Flows Interactive Mapping Application



Source: Transearch (Truck Data), Surface Transportation Board (STB) (Rail Data)
This origin-destination map shows top 30 locations matching your current filter settings. Note that wordcloud for commodities cannot be shown for rail mode at smaller geographies such as PDC and Construction District levels.
Download PDF: Metadata-Commodity Flow

Figure 14: Freight Commodity Flows Interactive Mapping Application: Word Cloud of Commodity Types

4.4.5 Review of Freight Issues

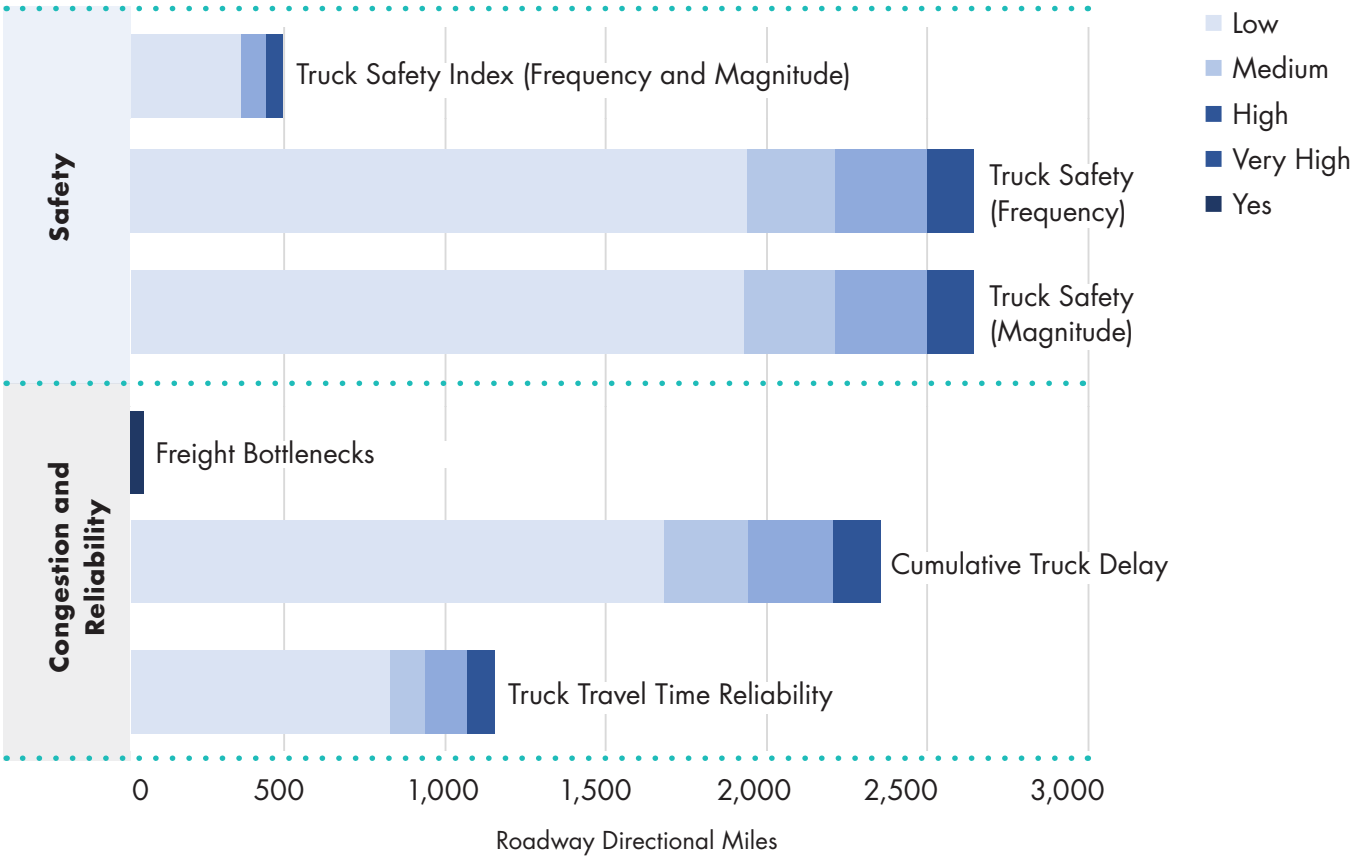
The review of freight issues builds from the CTB-adopted Mid-term Needs, focusing on data-driven analysis to identify freight related needs with consideration of rail, air, and waterborne freight. Additional data and review of opportunities for modal efficiencies were analyzed, but not included in the roadway-based dataset due to inconsistency in data availability and format.

The review of freight issues, including identified Truck Safety issues and Freight Bottlenecks, may inform future updates to the Board's established Policy for the Identification and Prioritization of Mid-term Needs.

4.4.5.1 Highway Network Safety, Congestion, and Reliability

InteractVTRANS Several freight performance measures for safety, congestion, and reliability were developed for the purposes of identifying freight issues. Figure 15 below demonstrates the number of directional roadway miles resulting from this analysis. The results, including locations of Truck Bottlenecks, are available via the InteractVTrans mapping application. Additional detail on technical methods associated with freight performance measures is available in Appendix C: Freight Performance Measures Methodology Documentation.

Figure 15: Identification of Freight Issues – Safety, Congestion, and Reliability



Freight Bottlenecks are identified based on a combination of severity and magnitude through two performance measures:

- Truck Travel Time Reliability – Available on InteractVTrans
- Cumulative Truck Delay – Available on InteractVTrans

The Freight Bottlenecks will be monitored and reported in accordance with the applicable Federal requirements for performance monitoring. The mechanism for reporting will be through periodic updates to the System Performance Report included as Appendix E in this report.

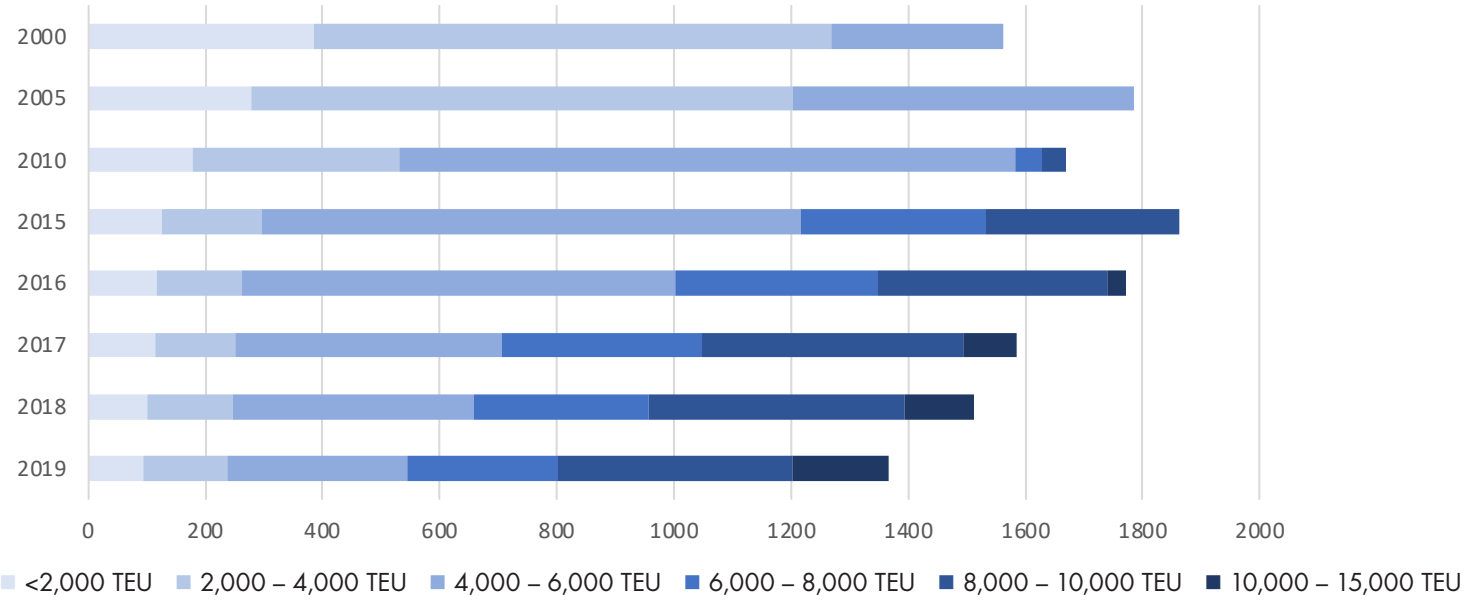
Note that the identified bottleneck locations are available for review on InteractVTrans, and additional details on the methodology for identification is available in Appendix C: Freight Performance Measures Methodology Documentation.

4.4.5.2 Concentrated Demand at Port Facilities

Compared to passenger vehicles, trucks have fewer trip generation and destination points, therefore truck volumes tend to be more concentrated in or around certain facilities. The Port of Virginia and other private terminals in the Hampton Roads region drive a significant number of truck trips. Available data and trends indicate fewer but larger container ships are arriving at the Port of Virginia and private terminals in Hampton Roads (Figures 16 and 17). The increase in size of container ships indicates a likely increase in more concentrated demand on the transportation infrastructure into the future.

The increasing size of container ships and trend toward concentrated demand on the transportation network is anticipated to continue into the future.

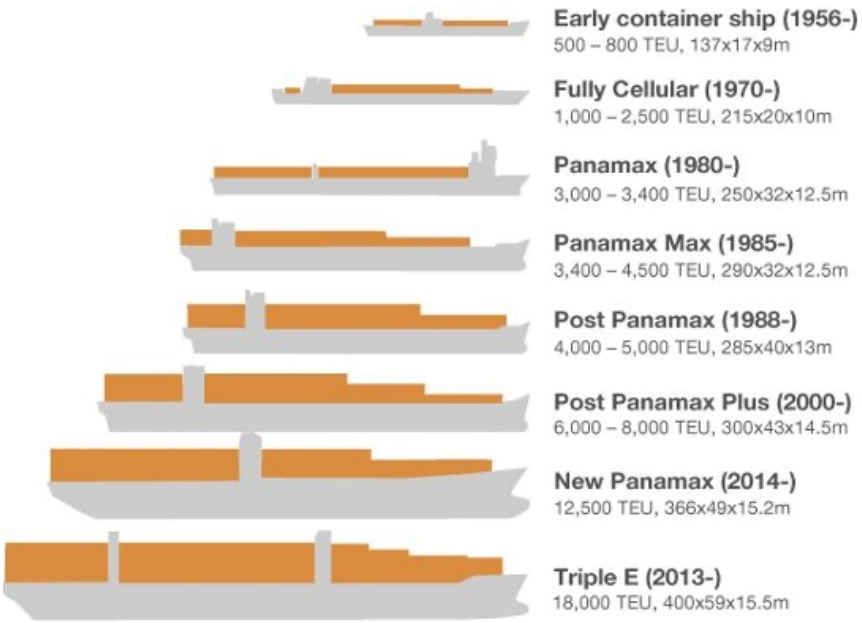
Figure 16: Container Ship Calls by Ship Category, Port of Virginia and Private Terminals



Source: United States Army Corps of Engineers

Figure 17: Evolution of Container Ships

TEU: twenty-foot equivalent units.
length x width x depth below water in meters.



Adapted with permission from The Geography of Transport Systems, Jean-Paul Rodrigue

Source: The Geography of Transport Systems

Virginia's relatively high rail mode share for freight, and specifically its increasing rail mode share for the Port of Virginia, helps move freight more efficiently. Virginia can continue to build upon this by developing more intermodal facilities.

4.4.5.3 Modal Efficiencies

The opportunity to convert truck trips to rail or barge movements aligns with VTrans Guiding Principles #2, #4, and #7 and with CTB Goal E.[1] Several factors influence the modal decisions for freight movement.

The conversion of truck trips to rail or barge presents an opportunity for modal efficiency, however, an understanding of private sector decision making will be necessary to craft appropriate strategic actions that build upon the Commonwealth's freight rail programs (see list of programs here).

Some markets have a higher potential to benefit from mode shift than others. Movement of bulk commodities (e.g., coal) rely primarily on rail, whereas high-value and time-sensitive commodity movements are dominated by truck or aviation. This can be due to weight, time sensitivity, distance (as demonstrated in Figure 18), or other factors. The opportunity to shift modal decisions exist where rail and trucks compete to a significant degree.

According to IHS Markit Transearch data, the largest volumes of freight carloads both originating and terminating in Virginia are intermodal (i.e., containerized cargo) and coal. Opportunities for mode shifts may exist where there are competitive movements, where mode share is somewhat comparable between rail and trucks. A competitive movement means that the cost and level of service, taken together, are close economic equivalents for shippers in a given market.

The following factors drive modal choice decisions into the future:

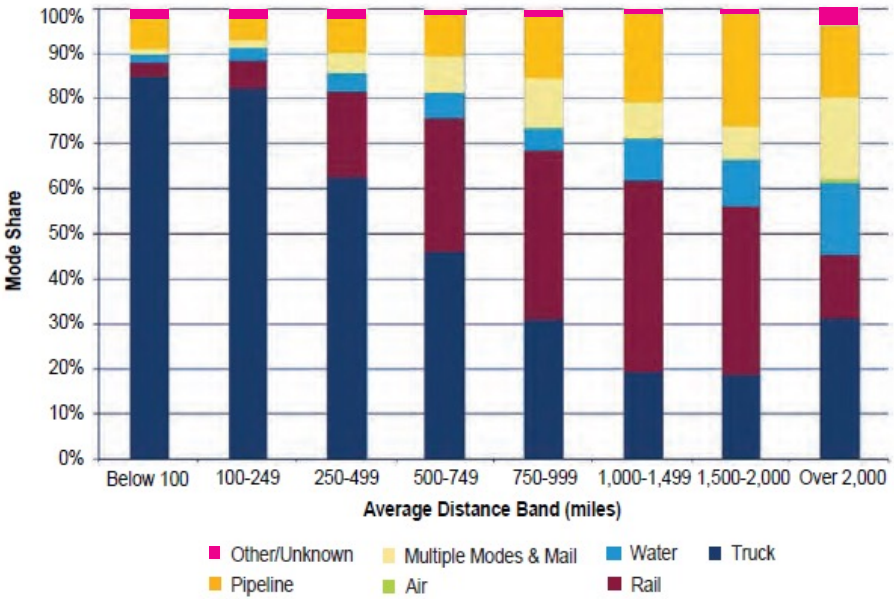
- Truck pricing variables
  - Wages and fuel costs
  - Other determinants of price: business cycle, tightness of fleet market, imbalance of cargo flows and available return loads, equipment location and empty miles, delays, etc.
- Shifts in international supply chains to the east coast could shorten the inland length of haul (shift to truck mode)
- Application of technology to the trucking sector could reduce empty miles and lower cost
- Technology may allow some shipments to move from less-than-truckload (LTL) to multi-stop truckload
- Rising fuel costs could make trucking less competitive

The VTrans policy allows for the monitoring of system trends over time (5.1.5 VTrans Trend Trackers) and the ability to revisit Strategic Actions that may encourage opportunity for modal efficiencies in freight movements.

Factors Influencing Modal Decisions for Freight Movement

- **Rates:** rarely the only determinant of mode choice because companies need to maintain quality of service in operations
- **Quality of service:** key factors include reliability (i.e., on-time delivery) and the level of service, including transit time
- **Product type:** high-value products are sent by truck due to the time sensitivity of the demand; lower value goods are often moved by rail or barge
- **Seasonal changes:** extreme weather may result in delays depending on modal choice
- **Length of haul:** impacts of international supply chains
- **Access to rail terminals:** access determines optionality

Figure 18: Modal Share of Freight Ton-miles by Distance Band



Source: NCFRP Report 40, Impacts of Policy-Induced Freight Modal Shifts, TRB, 2018.

[1]See pages 9-10 for listing of Guiding Principles, Goals, and Objectives.

4.4.6 Review of Emerging Freight Trends

Section 5 of this report includes an overview of the VTrans Long-term Risk & Opportunity Register which identifies megatrends and associated macrotrends that may impact the Commonwealth's transportation system. These trends are expected to have a significant impact on freight movement in Virginia, and will be closely monitored by the Commonwealth as outlined in Section 5.1.5 Tracking Macrotrends.

Key findings on emerging freight trends identified in the Long-term Risk & Opportunity Register are included in Table 7 below:

Table 7: Summary of Emerging Freight Trends

Macrotrend	Statistic	2045 Projected Statewide Change			Description
		High	Medium	Low	
Increase in Flooding Risk*	Sea Level Rise (Number of Miles)	1,424	1,101	935	Approximately 935 to 1,424 miles of Virginia's roadways will be at risk of flooding due to sea level rise by 2045
	Storm Surge (Number of Miles)	17,092	13,095	7,706	Approximately 7,706 to 17,092 miles of Virginia's roadways will be at risk of flooding due to storm surge by 2045
	Inland-Riverine (Number of Miles)	18,250	17,829	17,475	Approximately 17,475 to 18,250 miles of Virginia's roadways will be at risk of inland/ riverine flooding by 2045
Adoption of Highly Autonomous Vehicles	Heavy Vehicle Level 4 AV Market Share	12%			Approximately 12% of Virginia's heavy vehicle fleet will be made up of level 4 autonomous vehicles
Adoption of Electric Vehicles**	Medium-to-Heavy Truck Fleet Market Share	42%	48%	1%	Approximately 1% to 48% of Virginia's medium-to-heavy truck fleet will be made up of electric vehicles
Growth in E-Commerce	Business-to-consumer (B2C) e-commerce sales	$34.9 billion	$25.6 billion	$16.5 billion	
	E-commerce share of total B2C sales	31%	22%	14%	Approximately 14% to 31% of Virginia's retail sales will be through e-commerce.
	B2C E-commerce number of jobs	181,000	132,500	85,600	Virginia will have approximately 85,600 to 181,000 jobs related to retail e-commerce.
	Business-to-business (B2B) e-commerce sales	$29.2 billion	$26.7 billion	$24.2 billion	
	E-commerce share of total B2B sales	58%	53%	48%	Approximately 48% to 58% of Virginia's wholesale sales will be through e-commerce.
Greater Automation of Production and Services	Goods Movement Dependent Jobs	1,395,700			
	3D Printing Jobs	29,652	16,585	2,147	
	3D Printing Output (Market Share of Total Output)	13%	7%	1%	
	Drone Deliveries (Market Share of E-commerce deliveries)	25%	13%	5%	

* Please review the map showing flooding risk on InteractVTrans

**Note: Electric vehicle share is lower in high scenario than in medium scenario due to projected increase in hydrogen-fueled trucks in high scenario for 2045

4.4.7 Strategic Actions Relevant to Freight Element[1]

Section 6 of this report includes the initiatives and recommendations to achieve the CTB's vision, accelerate addressing Mid-term Needs, and be better prepared for long-term risks and opportunities.

The Strategic Actions relevant to the VTrans Freight Element are identified in Section 6 with this icon.

4.4.8 Freight Investment Plan

The VTrans Freight Element includes a freight investment plan that lists the priority projects and describes how funds are made available to carry out 23 U.S.C. § 167 – National highway freight program will be invested and matched pursuant to 49 U.S.C. § 70202.

The freight investment plan is updated more frequently than the overall VTrans Freight Element, and therefore is included as Appendix F: Freight Investment Plan which will be periodically updated and made available on the VTrans website at: https://vtrans.org/mid-term-planning/freight-plan.

4.4.9: Coordination with Multi-state Freight Compact

Virginia is a member-participant of five multi-state freight organizations: The Eastern Transportation Coalition (TETC), the I-81 Corridor Coalition (I-81 CC), The National Coalition for Truck Parking, the Appalachian Regional Commission (ARC), and the Institute for Trade and Transportation Studies (ITTS). The activities around these groups are to provide a platform for peer exchange formed around common regions, corridor(s), or freight issues. They are also working on projects to develop tools and procure data to support member states' freight planning and operations efforts. The peer exchange activities of these groups give an opportunity to learn about the recommendations generated within participating states. However, the coalitions have not generated recommendations to the states.

4.4.10: Considerations in Project Planning Activities

Consideration for environmental impact including, local air pollution, flooding and stormwater runoff, and wildlife are reflected in Virginia's project planning activities that are conducted in accordance with applicable local, state, and federal requirements. Please refer to the following resources:

- Drainage Manual for flooding and stormwater runoff considerations available here – https://virginiadot.org/business/locdes/hydra-drainage-manual.asp.
- Air quality processes, guidelines, and requirements available here – https://virginiadot.org/projects/environmental_air_section.asp.
- Natural resources considerations available here – https://virginiadot.org/programs/pr-environmental.asp. VDOT implements numerous engineering and science-based solutions to avoid and compensate for impacts to wetlands and streams. Virginia support the continued survival of endangered species by creating habitat and reducing construction related impacts to flora and fauna.

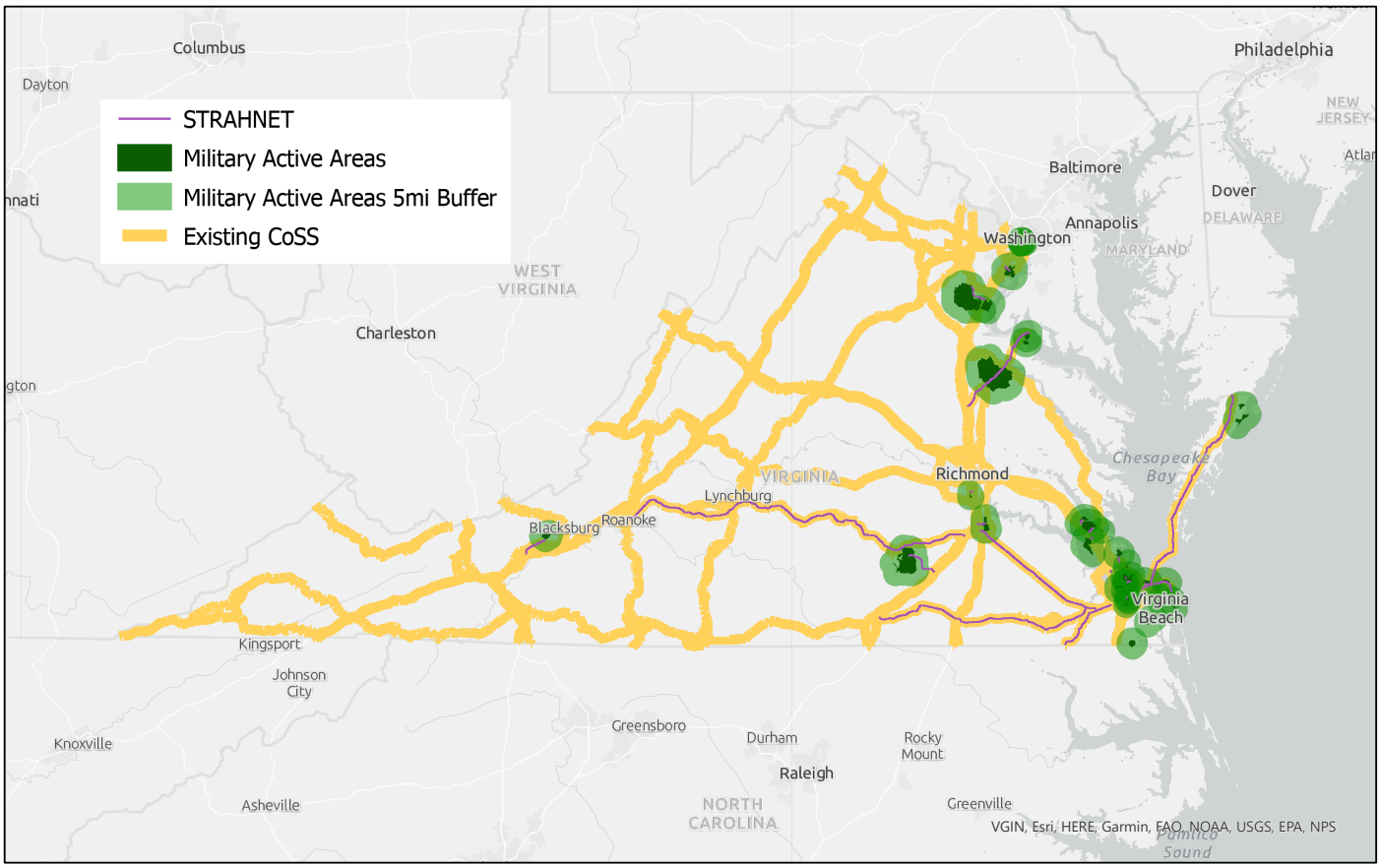
[1] Corresponds to National Freight Strategic Plan Goal: Prepare for the future by supporting the development of data, technologies, and workforce capabilities that improve freight system performance, and Goal: Modernize freight infrastructure and operations to grow the economy, increase competitiveness, and improve quality of life.

4.4.11: Considerations for Military Freight

Virginia has 40 active military installations with 29 locations in the Hampton Roads area. Military installations in the Hampton Roads region make up a significant military complex that includes the 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, Fort Eustis, Camp Peary, Yorktown Naval Weapons Station, and the Naval Supply Center Cheatham Annex.

Virginia's designated Corridors of Statewide Significance (CoSS) (Section 4.1.1), which includes seaport and airports, Primary Highway Freight System (PHFS) facilities, and the designated Critical Urban and Rural Freight Corridors (Section 4.4.2), serve the active military installations and encompass Strategic Highway Network (STRAHNET) (Figure 19).

Figure 19: Active Military Installations, STRAHNET, and CoSS



STRAHNET provides access, continuity, and emergency capabilities to all important military installations and ports in Virginia. These corridors collectively encompass the National Highway System (Interstates, Intermodal Connectors, Principal Arterials, and Strategic Highway Network Connectors) that serve all military bases in the state.

Virginia has established a process to systematically identify multimodal needs such as congestion and reliability, rail travel time reliability, safety, etc. along the designated CoSS using a performance-based, transparent, and replicable process. Please refer to Section 4.2 for the identified needs and Section 4.2.2 which note that "a VTrans Need Category does not specify a type or mode of response. For example, a solution to a Need for Improved Reliability may not be roadway-centric and can instead be addressed by multimodal infrastructure improvements such as transit or rail services or park-and-ride infrastructure. Similarly, a Need for Improved Reliability may also be addressed by policies (e.g., variable pricing, occupancy or vehicle restrictions, etc.) or programs such as commuter assistance programs."

Additionally, Virginia has established a performance-driven process to prioritize the identified needs. Please refer to Section 4.3 for more details. The CTB-approved policy to prioritize the mid-term needs allows Virginia to channel limited transportation dollars to Priority 1 locations and develop multimodal solutions in coordination with a wide range of stakeholders.

The established policies and processes mentioned above, along with several others, allow Virginia to serve both military and broader freight transportation system needs.

4.4.12 Considerations for Extreme Weather Events and Wildlife Habitat

Virginia is systematically tracking the impacts of four Megatrends and 10 Macrotrends. A Megatrend can have multiple Macrotrends and, for the 2021 iterations of the plan, Climate Megatrend has one Macrotrend – Flooding Risk. To identify the impacts of these mega and macrotrends, Virginia conducts a first-in-the-nation statewide flooding risk assessment for three types of natural hazards or extreme weather events: (1) sea-level rise; (2) storm surge; and, (3) inland/riverine flooding. Please refer to Section 5 for more details. The CTB policy allows consideration of additional Macrotrends considered based on evidence and availability of data.

VDOT is incorporating wildlife corridors and road crossings into project planning across Virginia. Virginia's SB 1004, approved in 2020, requires VDOT to participate with the Department of Wildlife Resources and the Department of Conservation and Recreation to develop a Wildlife Corridor Action Plan. The plan is expected to be completed in November of 2022.

Additionally, all projects that receive freight funds undergo the NEPA process and are required to identify environmental mitigation measures relevant to reducing the impact of freight projects on wildlife.

Finally, VDOT's internal procedures, such as IIM-LD-262, countermeasures for large animal crashes.

5. LONG-TERM PLANNING

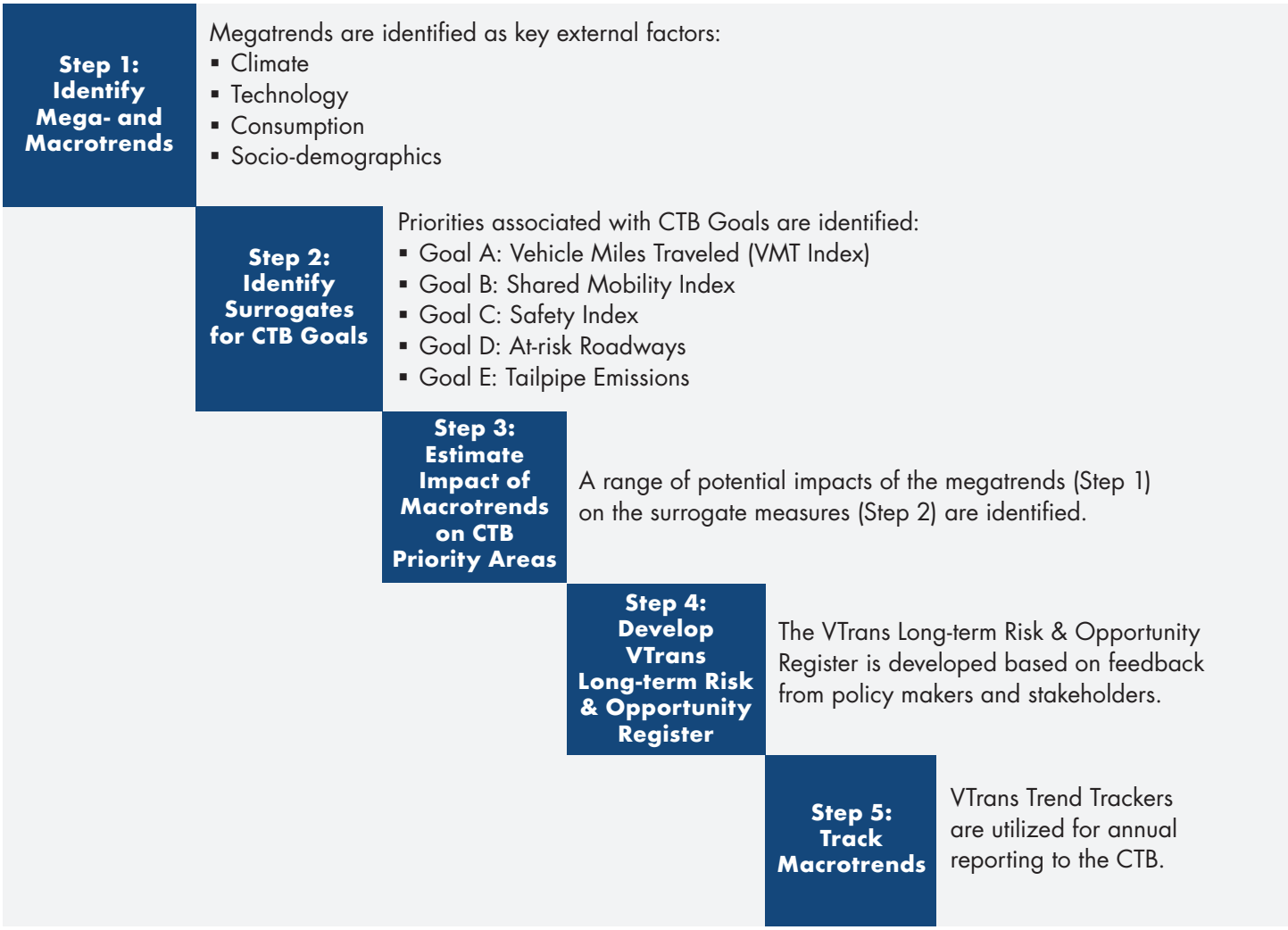
5.1 Risk & Opportunity Register

The VTrans Long-term Risk & Opportunity Register is developed based on the following steps (Figure 20):

- Step 1: Megatrends[1] and associated macrotrends[2] are identified.
- Step 2: CTB's priorities are identified based on CTB's Vision, Goals, and Objectives[3].
- Step 3: Impact of mega- and macrotrends on CTB's priorities is estimated.
- Step 4: VTrans Long-term Risk & Opportunity Register is developed based on the projected impacts on established priorities.
- Step 5: OIPI reviews and provides annual updates to the CTB for the identified risks and opportunities.

While the policy is outlined here more detail on methods can be found in the Technical Guide: Development and Monitoring of Long-term Risk & Opportunity Register.

Figure 20: Steps for the Development and Monitoring of VTrans Long-term Risk & Opportunity Register



[1] Megatrend: Megatrends are defined as "the great forces in societal development that will very likely affect the future in all areas over the next 10-15 years." A megatrend is also defined as "a large, social, economic, political, environmental, or technological change that is slow to form. Once in place, megatrends influence a wide range of activities, processes, and perceptions, both in government and in society, possibly for decades. They are the underlying forces that drive trends." Source: European Foresight Platform.

[2] Macrotrend: A macrotrend is defined as "an emerging pattern of change likely to impact state government and require a response. Multiple macrotrends can be associated with a megatrend." Source: Transportation Policy Task Force Suggested State Legislation Docket. 2009. California

[3] Commonwealth Transportation Board, Actions to Approve the 2019 VTrans Vision, Goals, Objectives, Guiding Principles and the 2019 Mid-term Needs Identification Methodology and Accept the 2019 Mid-term Needs, January 15, 2020

5.1.1 Step 1: Identify Mega- and Macrotrends

OIPI has identified and shall periodically update mega- and macrotends identified in Table 8 to account for factors significant from a transportation planning and investment perspective. The identified megatrends are large social, economic, political, environmental, or technological changes that are slow to form, while macrotrends are emerging patterns of change likely to impact State government and require a response.

Table 8: VTrans Mega- and Macrotrends

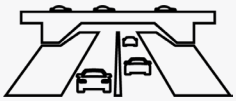
MEGATREND 1: CLIMATE	
	Macrotrend 1: Increase in Flooding Risk[1]
MEGATREND 2: TECHNOLOGY	
	Macrotrend 2: Adoption of Highly Autonomous Vehicles
	Macrotrend 3: Adoption of Electric Vehicles
	Macrotrend 4: Growth in Shared Mobility
MEGATREND 3: CONSUMPTION	
	Macrotrend 5: Growth in E-commerce
	Macrotrend 6: Greater Automation of Production and Services
MEGATREND 4: SOCIO-DEMOGRAPHICS	
	Macrotrend 7: Growth of Professional Services Industry
	Macrotrend 8: Increase in Workplace Flexibility
	Macrotrend 9: Growth of the 65+ Cohort
	Macrotrend 10: Population and Employment Shift

[1] Definition of Vulnerability: Vulnerability is a function of exposure to a hazard(s), the sensitivity to the given hazard, and adaptive capacity or the system's ability to cope. Definition of Resiliency: The capability to anticipate, prepare for, respond to, and recover from extreme weather event(s) with minimum damage to social well-being, infrastructure, the economy, and the environment.

5.1.2 Step 2: Identify Metrics for CTB Goals

OIPI shall establish indicators, herein after referred to as metrics, for each CTB Goal (see Section 3, page 10 of this report for full descriptions).

Table 9: Metrics for CTB Goals

Goals	Objectives	Metrics for CTB Goals and Objectives
Goal A Economic Competitiveness and Prosperity	A.1. Reduce the amount of travel that takes place in severe congestion	Vehicles Miles Traveled (VMT) Index (Estimated Change due to VTrans Macrotrends)
	A.2. Reduce the number and severity of freight bottlenecks	
	A.3. Improve reliability on key corridors for all modes	
Goal B Accessible and Connected Places	B.1. Reduce average peak-period travel times in metropolitan areas	Shared Mobility Index (Switchable Urban Auto SOV VMT to Micromobility and TNC/Ridesourcing)
	B.2. Reduce average daily trip lengths in metropolitan areas	
	B.3. Increase the accessibility to jobs via transit, walking, and driving in metropolitan areas	
Goal C Safety for All Users	C.1. Reduce the number and rate of motorized fatalities and serious injuries	Safety Index (Safety Index - Estimated Change in Number of Crashes with Fatalities + Serious Injuries Due to VTrans Macrotrends)
	C.2. Reduce the number of non-motorized fatalities and serious injuries	
Goal D Proactive System Management	D.1. Improve the condition of all bridges based on deck area	Roadways at Risk from Flooding 
	D.2. Increase the lane miles of pavement in good or fair condition	
	D.3. Increase percent of transit vehicles and facilities in good or fair condition	
Goal E Healthy Communities and Sustainable Transportation Communities	E.1. Reduce per-capita vehicle miles traveled	Tailpipe Emissions Index (Estimated Change Due to VTrans Macrotrends)
	E.2. Reduce transportation related nitrogen oxides, volatile organic compounds, particulate matter, and carbon monoxide	
	E.3. Increase the number of trips traveled by active transportation (bicycling and walking)	

5.1.3 Step 3: Estimate Impact of Macrotrends on CTB Priority Areas

OIPI shall establish an order of influence and estimate cumulative impacts of macrotrends, as shown in Table 10, on metrics identified in step 2.

Table 10: Order of Influence of Macrotrends and Influence of Macrotrends on Surrogate Calculations

Order of Influence	Macrotrend (listed in order of influence)	VMT Index	Shared Mobility Index	Safety Index	Number of Directional Miles of Roadways at Risk from Flooding	Tailpipe Emissions Index
1	Macrotrend # 1: Increase in Flooding Risk				•	
	Macrotrend # 9: Growth of the 65+ Cohort					
2	Macrotrend # 8: Increase in Workplace Flexibility	•				•
	Macrotrend # 2: Adoption of Highly Autonomous Vehicles	•		•		•
	Macrotrend # 3: Adoption of Electric Vehicles	•				•
3	Macrotrend # 4: Growth in Shared Mobility	•	•			•
4	Macrotrend # 5: Growth in E-commerce	•				•
	Macrotrend # 6: Greater Automation of Goods and Services	•				•
5	Macrotrend # 7: Growth of Professional Services Industry Macrotrend # 10: Population and Employment Shift	Included in the 2045 Business-as-Usual Scenario				
	Cumulative Impacts	•	•	•	•	•

• Quantified in step 3

5.1.3.1 Impacts of Macrotrends on CTB Goals

A data-driven method, informed by published academic and reputed research, is used to identify the impact of external factors (mega- and macrotrends) on the CTB's transportation goals. These impacts are shown in Figure 21.

Figure 21: Impact of Macrotrends

	IMPACTS OF VTRANS MACROTRENDS Over and above impacts due to economic growth			WHAT IT MEANS[1]
	Low	Medium	High	
VEHICLE MILES TRAVELED (VMT) INDEX Estimated change in VMT	+4%	+8%	+17%	
SHARED MOBILITY INDEX Estimated urban auto Single-Occupancy Vehicle VMT switchable to micromobility + ridesourcing	+9%	+18%	+27%	
SAFETY INDEX Estimated change in number of crashes involving fatalities + serious injuries	-26%	-38%	-67%	
TAILPIPE EMISSIONS INDEX Estimated change in tailpipe emissions	-3%	-17%	-69%	
NUMBER OF MILES AT RISK FROM FLOODING	900 Sea Level Rise	1,100	1,400	
	7,700 Storm Surge	13,100	17,100	
	17,500 Inland/Riverine Flooding	17,900	18,200	

[1] Up logo: Desirable impact. Down logo: Undesirable impact.

5.1.4 Step 4: Develop VTrans Long-term Risk & Opportunity Register

OIPI shall develop and update the VTrans Long-term Risk & Opportunity Register based on feedback and direction from the CTB and other stakeholders.

The VTrans Long-term Risk & Opportunity shall allow for systematic and methodical identification of risks[1] and opportunities.[2] It shall also take into account the work completed in steps 1 through 3, including the order of influence established for the ten macrotrends and the magnitude of impact established in step 3.

Table 11: VTrans Long-term Risk & Opportunity Register

Macrotrend	Characterization	Description
		1. A large number of the State's roadways are at risk of flooding 2. Several unknown and unquantified flooding risks are present 3. Impacts of increased flooding risk are disproportionately higher for certain geographic areas and populations
		4. Proactively eliminate or mitigate identified flooding risks 5. Increase the State's preparedness to address other macrotrends associated with climate change megatrend

Opportunity (Uncertainty with a positive impact on CTB goals)

Risk (Uncertainty with a negative impact on CTB goals)

[1] The term risk is defined as a situation or scenario wherein there is some uncertainty and at least some probability of a negative outcome or result.

[2] The term opportunity is defined as a situation or scenario wherein there is some uncertainty and at least some probability of a positive outcome or result.

Macrotrend	Characterization	Description
		6. Greater wear-and-tear on the transportation system due to increased vehicle miles traveled (VMT) and increase in average vehicle weight
		7. Improve the State's ability to manage a transportation system with a high number of highly autonomous vehicles 8. Maximize safety benefits offered by highly autonomous vehicles, especially those with Automated Driving Systems
		9. Higher vehicle miles traveled (VMT) for each unit of economic activity compared to the present fleet
		10. Minimize environmental impacts of the transportation system development
		11. Increased curb access conflicts in urbanized areas
		12. Projected growth in shared mobility (micromobility and transportation network companies/ridesourcing) does not provide measurable transportation system benefits 13. Benefits of growth in shared mobility are not equally accessible by all areas and population segments
		14. Utilize shared mobility services to improve accessibility 15. Improve the State's ability to manage a transportation system with a high number of shared mobility vehicles
		16. Proactively eliminate or mitigate transportation impacts associated with e-commerce including those related to large warehouse and distribution centers
		17. Improve the State's ability to proactively manage transportation impacts associated with greater automation of production and services
		18. Maximize utilization of workplace flexibility for telework-capable jobs
		19. Transportation system and services are unable to meet mobility needs of Virginians age 65 and older

Opportunity (Uncertainty with a positive impact on CTB goals)

Risk (Uncertainty with a negative impact on CTB goals)

5.1.5 Step 5: Track Macrotrends

OIPI shall utilize Trend Trackers identified in Table 12 to provide updates to the CTB on VTrans macrotrends as well as any changes to the items identified in the VTrans Risk & Opportunity Register once per calendar year in July or September.

Table 12: VTrans Trend Trackers

VTrans Macrotrend	VTrans Trend Trackers	Expected Data Source
1. Increase in Flooding Risk	▪ Number of directional miles at risk from sea level rise ▪ Number of directional miles at risk from storm surge ▪ Number of directional miles at risk from inland/riverine flooding ▪ Annual cost of transportation repair due to flooding events	VTrans Vulnerability Assessment
2. Adoption of Highly Autonomous Vehicles	▪ Market Penetration of Semi-Autonomous (Levels 1 and 2) Vehicles[1] ▪ Attitude and Preferences for Adoption of Semi-Autonomous (Levels 1 and 2) Vehicles[1] ▪ Market Penetration of Highly Autonomous (Levels 3 and 4) Vehicles[1] ▪ Attitude and Preferences for Adoption of Highly Autonomous (Levels 3 and 4) Vehicles[1]	VTrans State of Transportation Biennial Survey
3. Adoption of Electric Vehicles	▪ Number of Electric Vehicles ▪ Market Penetration of Electric Vehicles ▪ Attitude and Preferences for Adoption of Electric Vehicles[1] ▪ Transportation Funding by Funding Source	Virginia Department of Motor Vehicles VTrans State of Transportation Biennial Survey
4. Growth in Shared Mobility	▪ Access to Shared Mobility Services[1] ▪ Utilization of Shared Mobility Services by Type[1]	VTrans State of Transportation Biennial Survey
5. Growth in E-Commerce	▪ Number of Warehouse and Distribution Centers ▪ Square Footage of Warehouse and Distribution Centers ▪ Share of E-commerce Sales (Business-to-Business, Business-to-Consumers) ▪ Number of Jobs in Goods Movement Dependent Industries	Transearch U.S. Census Quarterly E-Commerce Report U.S. Census Annual Report for Wholesale Trade U.S. Bureau of Labor Statistics State Occupational Employment and Wage Estimates for Virginia

Trend Trackers relevant to the VTrans Freight Element

[1] OIPI shall conduct a biennial statistically valid survey to measure these trend trackers.

VTrans Macrotrend	VTrans Trend Trackers	Expected Data Source
6. Greater Automation of Production and Services	▪ Number of Short-range Drone Deliveries ▪ Number of Long-range Drone Deliveries	TBD
7. Growth of Professional Services Industry	▪ Share of Professional Services Industry Jobs ▪ Number of STEM Jobs	IHS Markit, Woods & Poole, Employment Estimates by NAICS 2-digit code
8. Increase in Workplace Flexibility	▪ Number of Workers with Workplace Flexibility[1] ▪ Utilization of Workplace Flexibility[1]	VTrans State of Transportation Biennial Survey Bureau of Labor Statistics, Current Population Survey
9. Growth of the Age 65+ Cohort	▪ Number of Virginians Age 65 or higher ▪ Share of Age 65+ Cohort	U.S. Census Decennial reports and American Community Survey, Population by Age
10. Population and Employment Shift	▪ VTrans Land Use Vitality (LUV) Index ▪ Population ▪ Employment ▪ Income	Weldon Cooper Center for Public Service, Annual Population Estimates Bureau of Labor Statistics Quarterly Census of Employment and Wages Woods & Poole, Moody's Analytics, Income Estimates

Trend Trackers relevant to the VTrans Freight Element

[1] OIPI shall conduct a biennial statistically valid survey to measure these trend trackers.

6. STRATEGIC ACTIONS[1]

VTrans Strategic Actions are developed to: (1) advance transportation goals and objectives; (2) address identified transportation needs; and (3) minimize long-term risks to Virginia's transportation system and be better prepared to maximize benefits from long-term opportunities, including those items relevant to the Freight Element.

1. Collect data (e.g., right-of-way mapping, precipitation, roadway elevation, etc.) to accurately assess flooding risks for State- and locally-maintained roadways that can be used to identify funding needs and prioritize investment.

- Responsible entity(s): VDOT
- Intent: This action addresses VTrans Risk & Opportunity Register Item #2: Presence of unknown and unquantified flooding risk.

2. Develop policies, based on robust data collection and analysis, to ensure flooding risks are reflected in transportation asset life cycle and/or transportation project planning processes.

- Responsible entity(s): VDOT, DRPT
- Intent: This action addresses VTrans Risk & Opportunity Register Item #4: Proactively eliminate or mitigate identified flooding risks.

3. Collaborate with State/regional agencies to systematically identify solutions that facilitate consistent and systematic prioritization and support the allocation of state resources to address flooding risks.

- Responsible entity(s): VDOT, DRPT
- Intent: This action addresses VTrans Risk & Opportunity Register Item #4: Proactively eliminate or mitigate identified flooding risks.

4. Evaluate options to gather vehicle automation/capability data for the State's registered vehicle fleet to develop a more complete and accurate assessment of risks and opportunities associated with automated vehicles.

- Responsible entity(s): VDOT
- Intent: This action addresses VTrans Risk & Opportunity Register Item #7: Improve the State's ability to manage a transportation system with a high number of highly autonomous vehicles.

5. Develop a roadmap for implementing foundational digital practices such as digital- as-builts (DABs) and information management processes, for capturing asset information from projects.

- Responsible entity(s): VDOT, DRPT
- Intent: This action addresses VTrans Risk & Opportunity Register Item #7: Improve the state's ability to manage a transportation system with a high number of highly autonomous vehicles, and VTrans Guiding Principle #3: Efficient delivery of programs.

6. Evaluate and facilitate desirable deployment of vehicle-to-infrastructure communications along limited-access highways by the private sector.

- Responsible entity(s): VDOT
- Intent: This action addresses VTrans Risk & Opportunity Register Item #8: Maximize safety benefits offered by highly autonomous vehicles, especially those with Automated Driving Systems.

7. Evaluate opportunities to provide access to the available real-time or up-to-date State transportation asset and operations data in digital formats for use by the public and industry partners to support autonomous vehicle deployment.

- Responsible entity(s): VDOT, DRPT
- Intent: This action addresses VTrans Risk & Opportunity Register Item #8: Maximize safety benefits offered by highly autonomous vehicles, especially those with Automated Driving Systems.

8. Identify and develop solutions to address barriers to the installation of electric vehicle charging infrastructure by the private sector.

- Responsible entity(s): OIPI
- Intent: This action addresses VTrans Risk & Opportunity Register Item #10: Minimize environmental impacts of the transportation system development.

Strategic Actions relevant to the VTrans Freight Element

[1] VTrans Strategic Actions are not listed in any particular order as many of them are interrelated. Some strategies may require adjustment or sequential implementation depending on the status of other strategies.

9. Evaluate and establish sidewalk and curb management best practices for State-owned roadways and promote them for locality-owned roadways.

- Responsible entity(s): OIPI
- Intent: This action addresses VTrans Risk & Opportunity Register Items: #11: Increased curb access conflicts in urbanized areas; #14: Utilize shared mobility services to improve accessibility; and #15: Improve the State's ability to manage a transportation system with high number of shared mobility vehicles.

10. Formalize a process for needs identification and prioritization for the § 33.2-372: Interstate Operations and Enhancement Program utilizing the transportation planning policies established by the CTB in VTrans.

- Responsible entity(s): OIPI
- Intent: This action addresses CTB Guiding Principle #1: Optimize return on investment and Guiding Principle #3: Efficiently deliver programs.

11. Evaluate the performance of selected construction projects from the SMART SCALE, Interstate Operations and Enhancement Program, Virginia Highway Safety Improvement Program, and DRPT's MERIT program to determine if the selected projects are providing the anticipated benefits to support efforts to continue to improve project evaluation criteria and methods.

- Responsible entity(s): OIPI
- Intent: This action addresses CTB Guiding Principle #1: Optimize return on investment and Guiding Principle #3: Efficiently deliver programs.

12. Establish a regular study cycle for Project Pipeline studies, as defined in the CTB Policy for the Prioritization of VTrans Mid-term Needs adopted in March 2021, to include solutions for the most up-to-date Priority 1 and 2 locations.

- Responsible entity(s): OIPI
- Intent: This action addresses: VTrans Mid-term Needs and Priority Locations; CTB Guiding Principle #3: Efficiently deliver programs; and CTB Guiding Principle #5: Ensure Transparency and Accountability, and Promote Performance Management.

13. Evaluate the feasibility of and alternatives to a combined dashboard to monitor performance and delivery of projects and programs included in the Six-Year Improvement Program (SYIP).

- Responsible entity(s): VDOT, DRPT
- Intent: This action addresses CTB Guiding Principle #3: Efficiently deliver programs and Guiding Principle #5: Ensure Transparency and Accountability, and Promote Performance Management.

14. Evaluate and, if feasible, integrate the remaining application-based highway and transit capital funding programs and transit operating funding programs administered by OIPI, VDOT, and DRPT into SMART PORTAL to provide one-stop access to the State's funding programs.

- Responsible entity(s): VDOT, DRPT, OIPI
- Intent: This action addresses CTB Guiding Principle #1: Optimize return on investment and Guiding Principle #3: Efficiently deliver programs.

15. Identify and clarify roles and responsibilities of the State transportation agencies related to emerging areas such as curb management, shared mobility, drones, etc., to ensure greater focus.

- Responsible entity(s): OIPI
- Intent: This overarching action addresses all items identified in the VTrans Risk & Opportunity Register.

16. To methodically address items in the 2021 VTrans Risk & Opportunity Register, formalize OIPI's role in supporting and advising the CTB in the conduct of CTB business and the development of a comprehensive transportation policy as required by 2.2-229.

- Responsible entity(s): OIPI
- Intent: This overarching action addresses all items identified in the VTrans Risk & Opportunity Register.

Strategic Actions relevant to the VTrans Freight Element

APPENDIX A:
SYNTHESIS OF FEDERAL REQUIREMENTS AND VTRANS ACTIVITIES

Table 13 below identifies federal requirements for a statewide plan and references a section in the report that addresses that requirement.

Table 13: Federal Requirements and Reference Chapter

ID	Federal Code	Requirements	Reference Section
Requirements related to the State Transportation Plan			
1	23 U.S.C. § 135	Each state shall develop a statewide transportation plan with a minimum 20-year forecast period	▪ Section 2: Introduction to VTrans ▪ Section 5: Long-term Planning
2	23 U.S.C. § 135	Each state's statewide transportation plan shall be multimodal	▪ Section 3: VTrans Vision, Guiding Principles, Goals, and Objectives
3	23 U.S.C. § 135	Each state's statewide transportation plan shall include coordination with MPO's and other regional organizations	▪ Appendix D: Stakeholder Engagement
4	23 U.S.C. § 135	Each state's statewide transportation plan shall take consideration of USDOT's ten planning factors:	▪ Section 3: VTrans Vision, Guiding Principles, Goals, and Objectives ▪ Section 4: Mid-term Planning ▪ Section 5: Long-term Planning ▪ Section 6: Strategic Actions
4.01	23 U.S.C. § 135	(1) Support the economic vitality of the United States, the States, metropolitan areas, and nonmetropolitan areas, especially by enabling global competitiveness, productivity, and efficiency,	
4.02	23 U.S.C. § 135	(2) Increase the safety of the transportation system for motorized and non-motorized users;	
4.03	23 U.S.C. § 135	(3) Increase the security of the transportation system for motorized and non-motorized users;	
4.04	23 U.S.C. § 135	(4) Increase accessibility and mobility of people and freight;	
4.05	23 U.S.C. § 135	(5) Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns;	
4.06	23 U.S.C. § 135	(6) Enhance the integration and connectivity of the transportation system, across and between modes throughout the State, for people and freight;	
4.07	23 U.S.C. § 135	(7) Promote efficient system management and operation;	
4.08	23 U.S.C. § 135	(8) Emphasize the preservation of the existing transportation system;	
4.09	23 U.S.C. § 135	(9) Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation; and	
4.10	23 U.S.C. § 135	(10) Enhance travel and tourism.	
5	23 U.S.C. § 135	Each state's statewide transportation plan shall use a performance-based approach (including the use of performance targets)	▪ Section 3: VTrans Vision, Guiding Principles, Goals, and Objectives ▪ Section 4: Mid-term Planning ▪ Section 5: Long-term Planning ▪ Section 6: Strategic Actions
6	23 U.S.C. § 135	Each state's statewide transportation plan shall include a discussion of potential environmental mitigation activities and potential areas to carry out these activities	▪ Section 5: Long-term Planning ▪ Section 6: Strategic Actions
7	23 U.S.C. § 135	Each state's statewide transportation plan shall include a consultative process to the maximum extent practicable	▪ Appendix D: Stakeholder Engagement

ID	Federal Code	Requirements	Reference Section
8	23 U.S.C. § 135	The state transportation plan shall be published or otherwise made accessible including online.	▪ Section 1: Purpose of the Report ▪ Appendix D: Stakeholder Engagement
9	23 CFR § 450.216	The Statewide Plan shall consider and include, as applicable, elements and connections between different modes, particularly with respect to intercity travel	▪ Section 4: Mid-term Planning
10	23 CFR § 450.216	The Statewide Plan shall consider and include, as applicable, shall reference, summarize, or contain relevant plans and studies;	▪ Section 4: Mid-term Planning
11	23 CFR § 450.216	The Statewide Plan shall consider and include, as applicable, shall include performance measures and targets and system performance report,	▪ Section 4: Mid-Term Planning ▪ Appendix E: System Performance Report
12	23 CFR § 450.216	The Statewide Plan shall consider and include, as applicable, be developed in cooperation with affected MPO's, or affected nonmetropolitan officials and/or tribal governments, and other state agencies,	▪ Appendix D: Stakeholder Engagement
13	23 CFR § 450.216	The Statewide Plan shall consider and include, as applicable, include a discussion of potential environmental mitigation activities	▪ Section 5: Long-term Planning ▪ Section 6: Strategic Actions
14	23 CFR § 450.216	The Statewide Plan shall consider and include, as applicable, the state shall provide opportunities for comment and participation, and make the plan available for public review.	▪ Appendix D: Stakeholder Engagement
15	23 CFR § 450.216	The Statewide Plan shall consider and include, as applicable, the state shall evaluate, revise, and periodically update the plan and provide copies to FHWA and FTA for informational purposes.	▪ Section 1: Purpose of the Report
16	23 CFR § 450.216	Each State shall carry out a continuing, cooperative, and comprehensive statewide transportation planning process that provides for consideration and implementation of projects, strategies, and services that will address the ten USDOT Planning Factors.	▪ Section 3: VTrans Vision, Guiding Principles, Goals, and Objectives ▪ Section 4: Mid-term Planning ▪ Section 5: Long-term Planning ▪ Section 6: Strategic Actions
17	23 CFR § 450.216	Each State shall provide for the establishment and use of a performance-based approach to transportation decision-making to support national goals	▪ Section 4: Mid-term Planning
18	23 CFR § 450.216	Each State shall integrate into the statewide transportation planning process, directly or by reference, the goals, objectives, performance measures, and targets described in this chapter, in other State transportation plans and transportation processes, as well as any plans developed by providers of public transportation in areas not represented by an MPO required as part of a performance-based program. Examples of such plans and processes include the HSIP, SHSP, the State Asset Management Plan for the National Highway System (NHS), the State Freight Plan (if the State has one), the Transit Asset Management Plan, and the Public Transportation Agency Safety Plan.	▪ Section 4: Mid-term Planning
19	23 CFR § 450.216	Each State shall consider the performance measures and targets established under this paragraph when developing policies, programs, and investment priorities reflected in the long-range statewide transportation plan and statewide transportation improvement program.	▪ Section 4: Mid-Term Planning ▪ Appendix E: System Performance Report

ID	Federal Code	Requirements	Reference Section
Requirements related to the State Freight Plan			
20	49 U.S.C. 70202	Identify of freight system trends, needs, and issues	▪ Section 4.4: Freight Element ▪ 4.4.5 Review of Freight Issues ▪ Appendix C: Freight Performance Measures Methodology Documentation
21	49 U.S.C. 70202	Description of the freight policies, strategies, and performance measures that will guide the freight-related transportation investment decisions.	▪ Section 4: Mid-term Planning ▪ Section 4.4: Freight Element ▪ 4.4.5 Review of Freight Issues ▪ 4.4.7 Strategic Actions relevant to Freight Element ▪ Section 6: Strategic Actions ▪ Appendix C: Freight Performance Measures Methodology Documentation
22	49 U.S.C. 70202	List, as applicable, multimodal critical rural freight facilities and corridors designated under the National Multimodal Freight Network (49 U.S.C. § 70103), and the critical rural and urban freight corridors designated under the National Highway Freight Program (23 U.S.C. § 167)	▪ Section 4.4: Freight Element ▪ Appendix B: Critical Freight Corridor Designation
23	49 U.S.C. 70202	Describe how the plan will enable the State to meet the national multimodal freight policy goals (49 U.S.C. § 70101[b]) and the national freight program goals (23 U.S.C. § 167)	▪ Section 4.4: Freight Element ▪ Section 6: Strategic Actions
24	49 U.S.C. 70202	Describe innovative technologies and operational strategies, including freight intelligent transportation systems, that improve the safety and efficiency of freight movement	▪ Section 4.4: Freight Element ▪ 4.4.7 Strategic Actions relevant to Freight Element ▪ Section 6: Strategic Actions
25	49 U.S.C. 70202	Describe improvements to mitigate the deterioration of roadways serving heavy vehicles	▪ Section 4.4: Freight Element ▪ 4.4.7 Strategic Actions relevant to Freight Element ▪ Section 6: Strategic Actions ▪ Appendix F: Freight Investment Plan
26	49 U.S.C. 70202	Provide an inventory of facilities within the State with freight mobility issues, and describe potential strategies to address such issues for State-owned or operated facilities.	▪ Section 4.4: Freight Element ▪ 4.4.5 Review of Freight Issues ▪ Appendix F: Freight Investment Plan
27	49 U.S.C. 70202	Include a freight investment plan listing priority projects and funding mechanisms	▪ Section 4.4: Freight Element ▪ Appendix F: Freight Investment Plan
28	49 U.S.C. 70202	Consider any significant congestion or delay caused by freight movements and potential strategies to mitigate that congestion or delay	▪ Section 4.4: Freight Element ▪ 4.4.5 Review of Freight Issues
29	49 U.S.C. 70202	Consult with the State Freight Advisory Committee, as applicable	▪ Appendix D: Stakeholder Engagement

ID	Federal Code	Requirements	Reference Section
30	23 USC 167 and 49 USC 70202 as amended by the Bipartisan Infrastructure Law (BIL/IIJA)	The most recent commercial motor vehicle parking facilities assessment conducted by the State under subsection (f); ''(f) COMMERCIAL MOTOR VEHICLE PARKING FACILITIES ASSESSMENTS.—As part of the development or updating, as applicable, of a State freight plan under this section, each State that receives funding under section 167 of title 23, in consultation with relevant State motor carrier safety personnel, shall conduct an assessment of— ''(1) the capability of the State, together with the private sector in the State, to provide adequate parking facilities and rest facilities for commercial motor vehicles engaged in interstate transportation; ''(2) the volume of commercial motor vehicle traffic in the State; and ''(3) whether there exist any areas within the State with a shortage of adequate commercial motor vehicle parking facilities, including an analysis (economic or otherwise, as the State determines to be appropriate) of the underlying causes of such a shortage.	▪ Please refer to Virginia Department of Transportation's 2022 Virginia Truck Parking Study available here.
31	23 USC 167 and 49 USC 70202 as amended by the Bipartisan Infrastructure Law (BIL/IIJA)	The most recent supply chain cargo flows in the State, expressed by mode of transportation;	▪ Section 4.4.4.4 (Also refer to https://vtrans.org/mid-term-planning/freight-plan)
32	23 USC 167 and 49 USC 70202 as amended by the Bipartisan Infrastructure Law (BIL/IIJA)	An inventory of commercial ports in the State;	▪ Section 4.4.3, Table 4
33	23 USC 167 and 49 USC 70202 as amended by the Bipartisan Infrastructure Law (BIL/IIJA)	If applicable, consideration of the findings or recommendations made by any multi-State freight compact to which the State is a party under section 70204;	▪ Section 4.4.9
34	23 USC 167 and 49 USC 70202 as amended by the Bipartisan Infrastructure Law (BIL/IIJA)	The impacts of e-commerce on freight infrastructure in the State;	▪ Section 4.4.6 ▪ Section 5.1.3.1 ▪ Section 5.1.4 ▪ Section 5.1.5 ▪ Section 6
35	23 USC 167 and 49 USC 70202 as amended by the Bipartisan Infrastructure Law (BIL/IIJA)	Considerations of military freight;	▪ Section 4.4.11 ▪ Section 4.4.4.4 (Also refer to https://vtrans.org/mid-term-planning/freight-plan)
36	23 USC 167 and 49 USC 70202 as amended by the Bipartisan Infrastructure Law (BIL/IIJA)	Strategies and goals to decrease— (A) the severity of impacts of extreme weather and natural disasters on freight mobility; (B) the impacts of freight movement on local air pollution; (C) the impacts of freight movement on flooding and stormwater runoff; and (D) the impacts of freight movement on wildlife habitat loss;	▪ Section 4.4.12 ▪ Section 4.4.6 ▪ Section 4.4.10 ▪ Section 5.1.3.1 ▪ Section 5.1.4 ▪ Section 5.1.5 ▪ Section 6

APPENDIX B:
CRITICAL FREIGHT CORRIDOR DESIGNATION

Table 14: Designated CRFC Routes

Route	Start Point	End Point	Length (center line miles)	CRFC ID*	Designating Entity
I-64	I-81 Interchange at Exit 191	VA/WV State Line	58.49	G	State
I-64	Staunton-Waynesboro Census Urbanized Area Boundary; approximately I-64/US 340 Interchange at Exit 94	Existing PHFS termini; approximately I-64/I-81 Interchange at Exit 221	7.25	G	State
I-64	Charlottesville Census Urbanized Area Boundary; approximately I-64 overpass of County Rd 781	Staunton-Waynesboro Census Urbanized Area Boundary; approximately I-64/SR 624 Interchange at Exit 96	22.15	G	State
I-64	Richmond Census Urbanized Area Boundary; approximately I-64/SR 288 Interchange at Exit 175	Charlottesville Census Urbanized Area Boundary; approximately I-64/SR 20 Interchange at Exit 121	53.69	G	State
I-295	Richmond Census Urbanized Area Boundary; approximately I-295/SR 615 Creighton Road at Exit 34	Richmond Census Urbanized Boundary; approximately I-295/SR 156 N Airport Rd at Exit 31	3.37	G	State
I-664	Exit 13 Bowers Hill Interchange	Exit 13 Bowers Hill Interchange	0.75	G	State
US 15/ US 29	Washington, DC-VA-MD Census Urbanized Area Boundary; approximately US 15/US 29 intersection with Buckland Mill Road	Washington, DC-VA-MD Census Urbanized Area Boundary; approximately US 15/US 29 intersection with Beverley's Mill Road	2.71	G	State
US 522	US 522 intersection at Farm Lane	US 522/I-66 interchange at Exit 6	5.56	E, F	State
			Total = 153.97		

*CRFC ID Criteria Code:

E: Connect to an international port of entry
F: Provides access to significant air, rail, water, or other freight facilities
G: Corridor that is vital to improving the efficient movement of freight of importance to the economy of the State.

Table 15: Designated CUFC Routes

Route	Start Point	End Point	Length (center line miles)	CRFC ID*	Designating Entity
I-64	Charlottesville Census Urbanized Area Boundary; approximately I-64 overpass of County Rd 781	Charlottesville Census Urbanized Area Boundary; approximately I-64/SR 20 Interchange at Exit 121	2.95	J	State
I-64	Staunton-Waynesboro Census Urbanized Area Boundary; approximately I-64/US 340 Interchange at Exit 94	Staunton-Waynesboro Census Urbanized Area Boundary; approximately I-64/SR 624 Interchange at Exit 96	2.23	J	State
I-581	Termini of existing PHFS; approximately I-581/SR 101 Interchange at Exit 3	I-81 at Exit 143	2.48	J	State
I-395	I-95	VA-DC Line	9.7	I, K	MPO - TPB
US 29	Old Route 670	NCL War-renton	2.5	K	MPO - TPB
VA 234	University Blvd.	I-66	3.5	J, K	MPO - TPB
VA 7	VA 267 (Dulles Toll Rd.)	VA 123 (Chain Bridge Rd.)	1.4	J, K	MPO - TPB
US 29	500 ft. east of Tysons Oaks Ct.	I-66	3.4	J, K	MPO - TPB
I-64	Battlefield Boulevard	I-664/Bowers Hill	9.6	J, K	MPO - HRTPO
I-664	I-64/Bowers Hill	Terminal Avenue	14.3	J, K	MPO - HRTPO
CUFC			**Total = 52.06**		

*CUFC ID Criteria Code:

I: Is located within a corridor of a route on the PHFS and provides an alternative option important to goods movement
J: Serves a major freight generator, logistic center, or manufacturing and warehouse industrial land
K: Is important to the movement of freight within the region, as determined by the MPO or the State

APPENDIX C: FREIGHT PERFORMANCE MEASURES METHODOLOGY

C.1 Performance Measure: Number of Truck-Involved Crashes

C.1.1 What it Means: Count of crashes in which a truck was one, or more, of the vehicles involved in the incident.

C.1.2 Applicable VTrans Travel Market: CoSS, RN

C.1.3 Identification of Needs

- Data sources:
  - VDOT, Virginia Linear Reference System (LRS) Road Shapefile v. 19.1
  - VDOT Traffic Engineering Division Highway Safety Section, Virginia Department of Motor Vehicles, annual crashes data https://www.virginiaroads.org/datasets/VDOT::full-crash-1/explore?layer=1
    Downloaded on March 18, 2021
- Year of analysis: Calendar years 2015, 2016, 2017, 2018, and 2019
- Period of analysis: Annual
- Calculations
  1. Assign crashes to Virginia road segments (LRS v19.1) through route name and mile-marker using the ArcGIS Linear Referencing Tool.
  2. For crashes which were not joined through the Linear Referencing Tool:
     - Using a geospatial tool, buffer crashes by 10 feet.
     - Using a geospatial tool, intersect buffer crashes with the LRS.
  3. Filter segments to only include those which had truck-involved crashes in at least 2 separate years.

C.2 Performance Measure: Truck-Involved Crashes Equivalent Property Damage

C.2.1 What it Means: Property damage associated with the crashes in which a truck was one, or more, of the vehicles involved in the incident

C.2.2 Applicable VTrans Travel Market: CoSS, RN

C.2.3 Identification of Needs

- Data sources:
  - VDOT Traffic Engineering Division Highway Safety Section, Virginia Department of Motor Vehicles, annual crashes data https://www.virginiaroads.org/datasets/VDOT::full-crash-1/explore?layer=1
  - Virginia Commonwealth Transportation Board, February 2021 SMART SCALE Technical Guide - http://smartscale.org/documents/2020documents/technical-guide-2022.pdf
- Year of analysis: Calendar years 2015, 2016, 2017, 2018, and 2019
- Period of analysis: Annual
- Calculations
  1. Start with the number of truck-involved crashes outlined in section 3.1.
  2. Multiply crashes by their severity with the equivalent property damage only costs (according to Table 6.2 in the SMART SCALE Technical Guide).

C.3 Performance Measure: Cumulative Delay

C.3.1 What it Means: Average annual number of hours of delay (travel time longer than the estimated free-flow speed)

C.3.2 Applicable VTrans travel market: CoSS

C.3.3 Identification of Needs

- Data sources:
  - INRIX data accessed via Regional Integrated Transportation Information System (RITIS) Massive Data Downloader: Observed truck speed
    - Downloaded on March 9, 2021

    - Conditions:
      - TMC Segments from NPMRDS INRIX 2018
      - Region set to Virginia
      - Date ranges:
        - 01/01/2017 – 12/31/2017
        - 01/01/2018 – 12/31/2018
        - 01/01/2019 – 12/31/2019
      - All days of week
      - Times of day: 6:00 AM – 8:00 PM
      - Units for travel time: seconds
      - Averaging: 1 hour
  - INRIX accessed via RITIS: Reference speed (an estimate of free-flow speed for all vehicles)
    - Downloaded on March 9, 2021
    - Conditions:
      - TMC Segments from NPMRDS INRIX 2018
      - Region set to Virginia
      - Date ranges:
        - 01/01/2017 – 12/31/2017
        - 01/01/2018 – 12/31/2018
        - 01/01/2019 – 12/31/2019
      - All days of week
      - Times of day: 6:00 AM – 8:00 PM
      - Units for travel time: seconds
      - Averaging: 1 hour
  - Highway Performance Monitoring System (HPMS), Truck AADT
  - File last modified on 03/15/2021
  - Crosswalk of INRIX traffic message channels (TMC) segments to Virginia LRS network roadway segments. VDOT, Virginia LRS Road Shapefile v. 19.1
- Year of analysis: Calendar years 2017, 2018, and 2019
- Period of analysis: The 14-hour period from 6 a.m. to 8 p.m. for all days of week.
- Calculations
  3. Locate hourly Observed Speed and Reference Speed data along INRIX traffic message channels (TMC) for each weekday and weekend hour between 6 a.m. and 8 p.m. in each year of analysis.
  4. Identify for each segment the minimum of the reference speed or 65 mph to create the Comparison Speed
  5. Subtract the Comparison Speed travel time from the Observed Speed travel time and divide by 3600 to create the Delay in Hours.
  6. If the Delay in Hours is negative (i.e., the Observed Speed travel time was quicker than the Comparison Speed travel time), set Delay in Hours to 0.
  7. Create the Delay in Hours per Mile by performing the following for each TMC segment and each year: Delay in Hours/TMC Segment Length
  8. Identify roadway TMC segments where, for a given hour, the Observed Speed was less than 75 percent of the Comparison Speed to create a Binary Congested Value with values of 1 for TRUE and 0 for FALSE.
  9. Sum the Delay in Hours per Mile by performing the following for each TMC segment and each year:

     For each TMC segment and each year:

     Where *i* is the range of hours from 6:00 A.M. to 8:00 P.M.
     Summed Delay Per Mile = $\sum_i$ *Delay in Hours per Mile*

10. For each TMC segment and each year, create the Number of Congested Hours by summing the Binary Congested Values.

    For each TMC segment and each year:

    Where i is the range of hours from 6:00 A.M. to 8:00 P.M.
    Number of Congested Hours = $\sum_i$ *Binary Congested Value*

11. Across the 3 years of data, for each TMC segment, create the Average Summed Delay per Mile by combining the Summed Delay per Mile in Hours using a simple average:

    For each TMC segment:

    Average Summed Delay Per Mile in Hours =
    $(Summed\ Delay\ Per\ Mile_{2017} + Summed\ Delay\ Per\ Mile_{2017} + Summed\ Delay\ Per\ Mile_{2019})/3$

12. Across the 3 years of data, for each TMC segment, create the Average Number of Congested Hours by combining the Number of Congested Hours using a simple average.

    For each TMC segment:

    Average Number of Congested Hours =
    $(Number\ of\ Congested\ Hours_{2017} + Number\ of\ Congested\ Hours_{2018} + Number\ of\ Congested\ Hours_{2019})/3$

13. Threshold for Congestion: Roadway segments where the Average Number of Congested Hours exceeds 5 percent (255.5 hours) of the total hours from 6 a.m. to 8 p.m. in a year.

14. Segments whose average number of congested hours exceeded the Threshold for Congestion are identified as having Cumulative Delay values of the Average Summed Delay per Mile in Hours.

15. Assign Cumulative Delay to the VDOT LRS network using the Crosswalk of INRIX TMC segments to Virginia LRS network roadway segments.

C.4 Performance Measure: Truck Travel Time Reliability

C.4.1 What it means: The Truck Travel Time Reliability is the weighted sum of ratios of the 80th percentile travel time (lower speeds) to the 50th percentile travel time (median speeds). A higher number indicates less reliable travel.

C.4.2 Applicable VTrans travel market: CoSS

C.4.3 Identification of needs:

- Data sources:
  - INRIX accessed via RITIS Massive Data Downloader: Observed truck speed
- Downloaded on March 9, 2021
- Conditions:
  - TMC Segments from NPMRDS INRIX 2018
  - Region set to Virginia
  - Date ranges:
    - 01/01/2017 – 12/31/2017
    - 01/01/2018 – 12/31/2018
    - 01/01/2019 – 12/31/2019
  - All days of week
  - Times of day: 6:00 AM – 8:00 PM
- Units for travel time: seconds
- Averaging: 1 hour
  - Crosswalk of INRIX traffic message channels (TMC) segments to Virginia LRS network roadway segments.
  - VDOT, Virginia LRS Road Shapefile v. 19.1

- Year of analysis: Calendar years 2017, 2018, and 2019
- Period of analysis: The 14-hour period from 6 a.m. to 8 p.m. on weekdays and weekend days.
- Calculations

1. Locate hourly Observed Speed data along INRIX traffic message channels (TMC) for each weekday and weekend hour between 6 a.m. and 8 p.m. in each year of analysis.
2. Calculate the 50th percentile travel time for each TMC segment for each year for weekdays and weekends.
3. Calculate the 80th percentile travel time for each TMC segment for each year for weekdays and weekends.
4. Calculate the Truck Travel Time Reliability (TTTR) by dividing the 80th percentile by the 50th percentile for each TMC segment for each year for weekdays and weekends.

   For each year and for weekday and weekend periods:

   TTTR = *80th Percentile Travel Time/50th Percentile Travel Time*
5. Set a TMC segment weekday TTTR to 0 if the TTTR was less than 1.3 on weekdays.
6. Set a TMC segment weekend TTTR to 0 if the TTTR was less than 1.3 on weekends.
7. For each year of data, for each TMC segment sum the weekend TTTR values.
   For each TMC segment and each year:

   Where *i* is the range of hours from 6:00 A.M. to 8:00 P.M.
   Summed Weekend TTTR = $\sum_i$ *Weekend tttr*
8. For each year of data, for each TMC segment sum the weekday TTTR values.
   For each TMC segment and each year:

   Where *i* is the range of hours from 6:00 A.M. to 8:00 P.M.
   Summed Weekday TTTR = $\sum_i$ *Weekday tttr*
9. Across the 3 years of data, for each TMC segment, create the Average Summed Weekend TTTR by combining the Summed Weekend TTTR using a simple average:

   For each TMC segment:

   Average Summed Weekend TTTR =
   $Summed\ Weekend\ TTTR_{2017} + Summed\ Weekend\ TTTR_{2018} + Summed\ Weekend\ TTTR_{2019} / 3$
10. Across the 3 years of data, for each TMC segment, create the Average Summed Weekday TTTR by combining the Summed Weekday TTTR using a simple average:

    For each TMC segment:

    Average Summed Weekday TTTR =
    $Summed\ Weekday\ TTTR_{2017} + Summed\ Weekday\ TTTR_{2018} + Summed\ Weekday\ TTTR_{2019} / 3$
11. Calculate the Weighted Average TTTR of weekday TTTR and weekend TTTR.

    For each TMC Segment:

    Weighted Average TTTR =
    (*Average Summed Weekday TTTR* x 5/7) + (*Average Summed Weekend TTTR* x 2/7)
12. Assign Weighted Average TTTR to the VDOT LRS network using the Crosswalk of INRIX TMC segments to Virginia LRS network roadway segments.

C.5 Calculations of Truck Operations Restrictions

C.5.1 What it Means: Truck operations restrictions show where and in what circumstances certain types of truck operations are not be permitted, which can negatively impact freight movement.

C.5.2 Applicable VTrans Travel Market: Statewide

C.5.3 Identification of Needs

- Data sources: VDOT
- Year of analysis: 2021
- Period of analysis: Not applicable
- Calculations

1. Group segment-level truck restrictions into one or more of the following categories: height, weight, length, through trucks, axles or tires, vehicle type. The alignment between detailed restriction labels (left) and the categories (right) are shown below.
   - No110inchHiVeh: Height
   - No120InchHiVeh: Height and Width
   - No25FtVeh: Length
   - No28FtThruTruck: Length
   - No30FtThruTruck: Length and Through Trucks
   - No30FtVeh: Length
   - No35FtThruTruck: Length and Through Trucks
   - No35FtThruVeh: Length and Through Trucks
   - No40Ft12ftHi3Ax: Length
   - No40FtThruTruck: Length
   - No40FtThruVeh: Length
   - No45FtThruTruck: Length
   - No4-tireVeh: Axles or Tires
   - No65FeetTT: Length
   - No8TonVeh: Weight
   - No98InchHiVeh: Height
   - NoCommVEH: Vehicle Type
   - NoThruTruck: Through Trucks
   - NoThruTT: Through Trucks
   - NoTrucks: Vehicle Type
   - NR Truck: Vehicle Type
   - NR30FtTruck: Length
   - NR35FtTruck: Length
   - NRTruck: Vehicle Type
   - NRTT: Vehicle Type
   - STAA-Restricted: STAA-Width
   - TrucksRestrict: Through Trucks
2. Assign these categories of needs to the freight needs dataset through the following steps.
   - Add a 40-foot buffer to the segment-level restrictions dataset.
   - Intersect buffered restrictions with the freight needs dataset.
   - For each segment in the freight needs dataset, compare the pre-intersection length with the post-intersection length. When the post-intersection length is over 25% of the pre-intersection length, retain the applicable restrictions for that segment. Otherwise, remove the segment.
3. Indicate that a restriction is present ("Yes") for any segments with a remaining truck operations restriction category.

C.6 Freight Priorities: Freight Bottlenecks

C.6.1 Applicable VTrans travel market: CoSS

C.6.2 Utilized for: Establishing statewide Freight Bottleneck locations.
Freight Bottlenecks are identified through two performance measures:

- Truck Travel Time Reliability
- Cumulative Truck Delay

C.6.3 Severity
See source data and methodology for Truck Travel Time Reliability (section 3.4)

C.6.4 Magnitude
See source data and methodology for Cumulative Truck Delay (section 3.3)

C.6.5 Consideration of severity and magnitude criteria

- Sort the Truck Travel Time Reliability measure in descending order and assign the following values based on mileage to develop statewide very high, high, medium, and low categorizations.
  - Very High (Score 7): TOP 5% of the total mileage
  - High (Score 6): 5.001%–10%
  - High (Score 5): 10.001%–15%
  - Medium (Score 4): 15.001%–20%
  - Medium (Score 3): 20.001%–25%
  - Low (Score 2): 25.001%–50%
  - Low (Score 1): Bottom 50.001%–100%
- Sort the Cumulative Truck Delay measure in descending order and assign the following values based on mileage to develop statewide very high, high, medium, and low categorizations.
  - Very High (Score 7): Top 5% of the total mileage
  - High (Score 6): 5.001%–10%
  - High (Score 5): 10.001%–15%
  - Medium (Score 4): 15.001%–20%
  - Medium (Score 3): 20.001%–25%
  - Low (Score 2): 25.001%–50%
  - Low (Score 1): Bottom 50.001%–100%
- Filter data to include only where both Severity and Magnitude are "Very High"

C.7 Freight Priorities: Safety Index

C.7.1 Applicable VTrans Travel Market: CoSS, RN

C.7.2 Utilized For: Establishing Statewide Safety Incidence locations.
Freight safety priorities are identified through two performance measures:

- Truck-Involved Crashes Equivalent Property Damage
- Number of Truck-Involved Crashes

C.7.3 Severity
See the source data and methodology for Truck-Involved Crashes Equivalent Property Damage (section 3.2)

C.7.4 Magnitude
See the source data and methodology for the Number of Truck-Involved Crashes (section 3.1)

C.7.5 Consideration of Severity and Magnitude Criteria

- Sort the Number of Truck-Involved Crashes measure in descending order and assign the following values based on mileage to develop statewide very high, high, medium, and low categorizations.
  - Very High (Score 7): TOP 5% of the total mileage
  - High (Score 6): 5.001%–10%
  - High (Score 5): 10.001%–15%
  - Medium (Score 4): 15.001%–20%
  - Medium (Score 3): 20.001%–25%
  - Low (Score 2): 25.001%–50%
  - Low (Score 1): Bottom 50.001%–100%
- Sort the Truck-Involved Crashes Equivalent Property Damage measure in descending order and assign the following values based on mileage to develop statewide very high, high, medium, and low categorizations.
  - Very High (Score 7): Top 5% of the total mileage
  - High (Score 6): 5.001%–10%
  - High (Score 5): 10.001%–15%
  - Medium (Score 4): 15.001%–20%
  - Medium (Score 3): 20.001%–25%
  - Low (Score 2): 25.001%–50%
  - Low (Score 1): Bottom 50.001%–100%
- For each segment, multiply the Severity and Magnitude measures.
- Sort the product of Severity and Magnitude measures in descending order and assign the following values based on mileage to develop statewide Very High, High, Medium, and Low categorizations.
  - Very High (Score 7): Top 5% of the total mileage
  - High (Score 6): 5.001%–10%
  - High (Score 5): 10.001%–15%
  - Medium (Score 4): 15.001%–20%
  - Medium (Score 3): 20.001%–25%
  - Low (Score 2): 25.001%–50%
  - Low (Score 1): Bottom 50.001%–100%

C.8 Calculations for Commodity Movement – Truck

C.8.1 What it Means: Truck Commodity Movement represents the truck freight traffic that travels in and through Virginia. Commodities can be measured based on tonnage or value.

C.8.2 Applicable VTrans Travel Market: Statewide

C.8.3 Identification of Needs

- Data sources:
  - Transearch, 2017 Baseline Commodity Flow Data
  - Transearch, 2030 Commodity Flow Projection Data
  - Transearch, 2045 Commodity Flow Projection Data
  - Transearch, 2017 Road Network Shapefile
  - VDOT, Virginia LRS Road Shapefile v. 19.1
- Year of analysis: Calendar Years 2017, 2030, 2045
- Period of analysis: Annual
- Calculations

1. Use the MS Access Transearch databases to calculate totals for truck tonnage and value by Transearch Segment ID (field 'LId'). In each Transearch database:
   - Join the "Transeach 2017" table to the "Highway Routes" table through 'First Node' and 'Last Node'.
   - Group by 'LId' (Highway Routes); sum 'Tons' (Transearch 2017); sum 'Value' (Transearch 2017); where 'Mode' (Transearch 2017) is >3 and <8.
     - The 'Mode' expression filters the Transearch 2017 table to include only Truck Modes (04 Truck Truckload Domestic US traffic, 05 Truck Less-Than-Truckload Domestic US traffic, 06 Truck Private Domestic US Traffic, and 07 Truck NEC – NAFTA traffic)
2. In ArcGIS, create and overlay the Transearch road network to the LRS network through Overlay Route Events, an ArcGIS for Desktop or ArcGIS Pro tool using the Transearch road name ('RID'), from measures, and to measure.
   - Export both the LRS shapefile and the Transportation Road Network Shapefile as tables.
   - Input into Overlay Route Events with the LRS table as in the input and the Transearch network as the Overlay Event Table.
     - Event Types = Line
     - Type of Overlay = Intersect
     - Do not keep zero length line events; include all fields from input; build index.
3. Use the Make Route Events Layer tool to overlay the table resulting from calculation step #2 onto the shapefile version of the LRS. Save the output.
4. Create a crosswalk relating non-directional Transearch segments with direction LRS segments.
   - For every road segment in the dataset that results from the calculation step # 3, make a duplicate segment with the opposite directionality. In R, flag directionality of the segments using the 'RID' field originally from the Transearch shapefile.
     - Manually fill in null road names in the 'RID' field based on the adjacent roadway segments.
     - Where the road name includes the text "NB," "SB," "EB," or "WB," flag the segment as being northbound, southbound, eastbound, or westbound respectively. Otherwise, flag as "unknown."
     - Make a duplicate road segment where the text in the 'RID' field is changed to indicate travel in the opposite direction.
     - Calculate the length of each roadway segment using the file geometry using the st_length function in the R "sf" package.
     - Make a 300-foot buffer around the roadway dataset using the st_buffer() function in the R "sf" package. Intersect this buffer with the LRS using the st_intersection() function in the R "sf" package. Calculate the post-intersection length.
     - Calculate the ratio of the pre-intersection length to the post-intersection length for each segment using the following equation.
       ratio = postintersection length / preintersection length

- Clean up the intersection dataset to remove roads that are not the same.
  - Remove roads with functional classes in the LRS that are marked as ramps, blank ("") or error.
  - Remove short segments whose post-intersection length is below 50 feet.
  - Remove segments whose ratio is less than or equal to 0.1.
- Remove road segments where the reversed direction from the Transearch data does not match the original direction from the LRS data. Where major roads in the LRS lack a directionality indicator, manually assign the correct direction, and retain in the dataset. These include "Powhite Pkwy," "Powhite Parkway," "Powhite Pkwy N," "Courthouse Rd," and "250/29 Bypass"
- Append the result of the previous step (f. remove road segments) using the rbind() function in R to the result of the Overlay Route Event function from calculation step # 3. For the new rows from calculation step # 3, set the "ratio" field to be equal to 1.
- Make a crosswalk between the Transearch shapefile and the LRS from the resulting table by grouping by the unique Transearch segment ID and the MasterNeedsSegmentID in the LRS and retaining the first instance of all associated attributes. Remove duplicates with the same MasterNeedsSegmentID, From_measure, and To_measures.

5. In MS Access, join the crosswalk from calculation step # 4 with the Transearch commodity flow data created in calculation step #1. For each Transearch segment, multiply the commodity tonnage and values by the previously calculated ratio and sum the resulting product by the MasterNeedsSegmentID. This produces commodity tonnage and value for both directions as the LRS segment level.

C.9 Calculations for Commodity Movement – Rail

C.9.1 What it Means: Rail Commodity Movement represents the rail freight traffic that travels in and through Virginia. Commodities can be measured based on tonnage or value.

C.9.2 Applicable VTrans Travel Market: Statewide

C.9.3 Identification of Needs

- Data sources:
  - Surface Transportation Board, Carload Waybill Sample with 2017 Baseline and 2030 and 2045 Projections
  - Surface Transportation Board, 2017 Rail Network Shapefile
  - Virginia Department of Rail and Public Transportation Rail (VA DRPT), 2021 Rail Network Shapefile
- Year of analysis: Calendar Years 2017, 2030, 2045
- Period of analysis: Annual
- Calculations

1. Buffer Waybill Rail Network by 1,000 feet.
2. Spatially intersect the buffered Waybill Rail Network with the VA DRPT Network in R using st_buffer() function in the "sf" package.
3. Join Waybill Rail Network to the VA DRPT Network through automated script using railroad owner and overlap.
   - Remove rows from the intersection where the railroad owner listed in the Waybill Rail Network is different form the railroad owner listed in the VA DRPT Network.
   - Remove rows from the intersection where commodity flow is null.
   - For each segment number from the VA DRPT network from the previous step, retain the segment with the greatest length after the intersection along with the ID for the associated Waybill segment.
4. Use the MS Access Waybill Carload Sample database to calculate total tonnage and value, by Waybill Segment ID. In the database,
   - Join the "Routed Rail Waybill" table to the "Rail Routes" table though 'Route Number'.
   - Group by 'Year' (Routed Rail Waybill), group by 'Segment' (Rail Routes), sum 'Tons,' sum 'Value.'
5. Assign rail tonnage and value to VA DRPT network. Using the results of the calculation step #3 and the total tonnage and value calculated in calculation step #4.

C.9.4 Additional Steps: Rail Commodities on the Virginia Road Network

- The process of section 3.5 Performance Measure: Commodity Movement – Truck and the Waybill Carload Sample used in section 3.6 Performance Measure: Commodity Movement - Rail can also be used to visualize rail commodity flows if travel occurred via truck instead.
- What it Means: Rail Commodity Movement represents the rail freight traffic that travels in and through Virginia on rail. Truck Commodity Movement represents the truck freight traffic that travels in and through Virginia on the road network. Assigning rail commodities to the road network using the routing of truck commodity movement shows to how rail commodities might travel via truck.
- Applicable VTrans Travel Market: Statewide
- Data sources:
  - Surface Transportation Board, Carload Waybill Sample with 2017 Baseline and 2030 and 2045 Projections.
  - Transearch, 2017 Baseline Commodity Flow Data
  - Transearch, 2017 Road Network Shapefile
  - VDOT, Virginia LRS Road Shapefile v. 19.1
- Year of analysis: Calendar Years 2017, 2030, 2045
- Period of analysis: Annual
- Calculations

1. Use the MS Access Waybill Carload Sample database to calculate total tonnage and value, by Origin and Destination. In the database,
   - Query the 'Route Rail Waybill' table: Group by 'Year'; group by 'Origin Region'; group by 'Destination Region'; sum 'Tons'; sum 'Value.'
2. Add the results of calculation step # 1 as a table to the MS Access 2017 Transearch database. Name the table "Waybill Summary by OD".
3. Use the MS Access Transearch databases to calculate totals for rail tonnage and value by Transearch Segment ID ('LID'). In the Transearch database:
   - Join the table added in calculation step # 2 (Waybill Summary by OD) to the "Transearch 2017" table through 'Origin Region' and 'Destination Region'.
   - Join the "Transeach 2017" table to the "Highway Routes" table through 'First Node' and 'Last Node'.
   - Group by 'Year' (Waybill Summary by OD); group by 'LId' (Transearch 2017); sum 'Tons' (Transearch 2017); sum 'Value' (Transearch 2017)
4. Join the results of calculation step # 3 to the LRS (v. 19.1) by following calculation steps #2 - # 5 in section 3.5 Performance Measure: Commodity Movement – Truck.

APPENDIX D:
STAKEHOLDER ENGAGEMENT

VTrans Groups and Committees Meetings

Group/Committee	Composition	Role in VTrans	Engagement
VTrans Steering Committee (VSC)	Representatives of VDOT, DRPT, Port of Virginia	Support development of VTrans major components	▪ 23 meetings
VTrans Freight Element Working Group	Representatives of VDOT, DRPT, Port of Virgin, Virginia DMV, Virginia Department of Aviation, Federal Highway Administration	Guide development of VTrans Freight Element on behalf of VTrans Steering Committee	▪ 7 meetings

Stakeholder Involvement

81 Meetings with MPO & PDC Policy Boards and Technical Committees

27 Public Meetings

17 Webinars

- 1,000+ Total Webinar Attendees

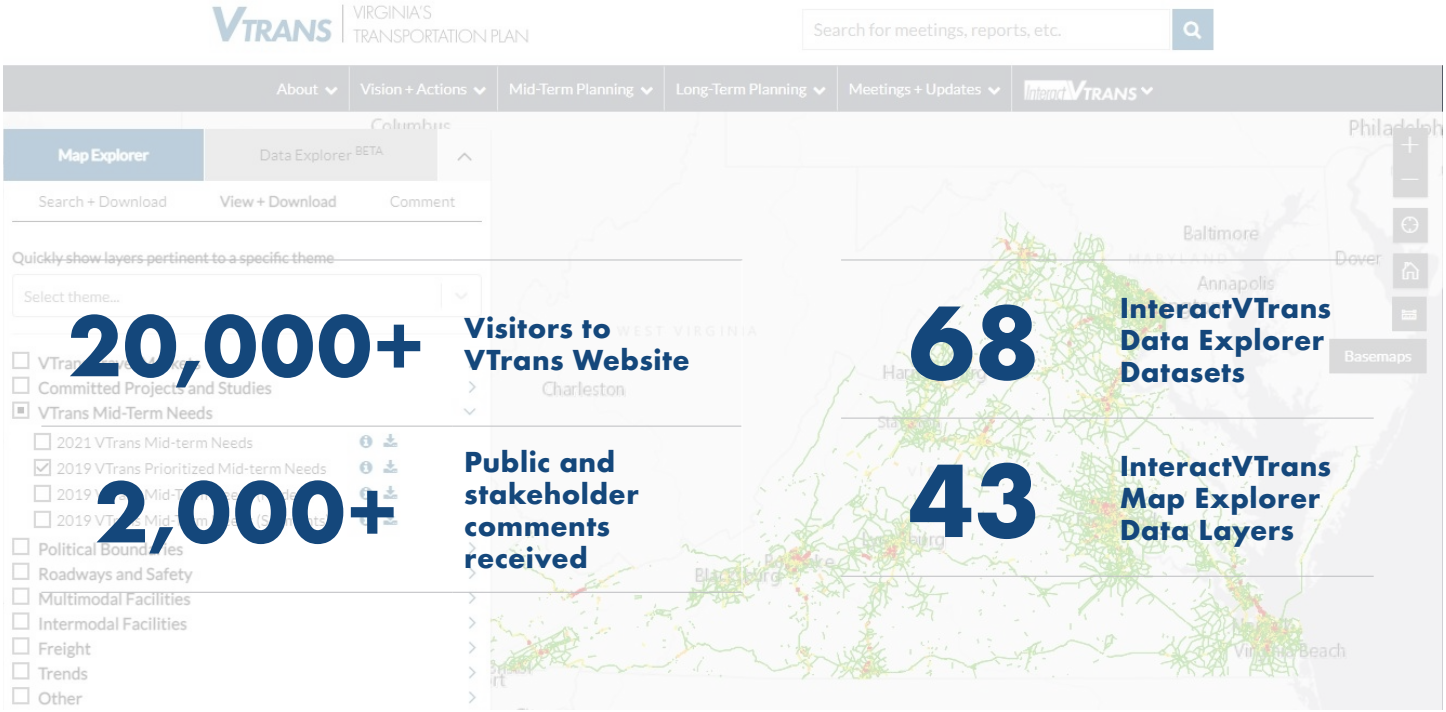
2 Presentations to Virginia Freight Advisory Committee

- 7 meetings: Multi-agency intermodal Freight Working Group

13 Regional Workshops

- **280** Individual Attendees
- **83** Cities & Counties (out of 133)
- **15** MPOS (out of 15)
- **30** Towns
- **16** Transit Agencies
- **16** PDCs

Information Sharing



20,000+ Visitors to VTrans Website

2,000+ Public and stakeholder comments received

68 InteractVTrans Data Explorer Datasets

43 InteractVTrans Map Explorer Data Layers

APPENDIX E:
SYSTEM PERFORMANCE REPORT

Transportation Performance Management

State Biennial Performance Report for Performance Period 2018-2021

2020

MID PERFORMANCE PERIOD (MPP) PROGRESS REPORT

Virginia

Report Due: 10/1/2020
Report Status: Submitted
Report Updated On:
Report Exported on 10/1/2020

This document is exported from the Federal Highway Administration's (FHWA) web-based Performance Management Form (PMF) of the Policy Information Data Portal (PIDP).

The web-based PMF is the State's official report to FHWA.

State Contact:

Name : Margie Ray
Phone number : 8043714864
Email : margie.ray@oipi.virginia.gov

Summary of Performance Measures and Targets

Performance Measures	Baseline	2-Year Condition/ Performance	2-Year Target	4-Year Target	4-Year Adjustment
Percentage of Pavements of the Interstate System in Good Condition		57.9%		45.0%	
Percentage of Pavements of the Interstate System in Poor Condition		0.3%		3.0%	
Percentage of Pavements of the Non-Interstate NHS in Good Condition	54.5%	54.4%			
Percentage of Pavements of the Non-Interstate NHS in Good Condition (Full Distress + IRI)		36.7%	25.0%	25.0%	
Percentage of Pavements of the Non-Interstate NHS in Poor Condition	9.1%	8.9%			
Percentage of Pavements of the Non-Interstate NHS in Poor Condition (Full Distress + IRI)		0.9%	5.0%	5.0%	
Percentage of NHS Bridges Classified as in Good Condition	33.6%	31.8%	33.5%	33.0%	30.5%
Percentage of NHS Bridges Classified as in Poor Condition	3.5%	2.6%	3.5%	3.0%	
Percent of the Person-Miles Traveled on the Interstate That Are Reliable	84.3%	83.6%	82.2%	82.0%	
Percent of the Person-Miles Traveled on the Non-Interstate NHS That Are Reliable		88.9%		82.5%	
Truck Travel Time Reliability (TTTR) Index	1.48	1.55	1.53	1.56	
Annual Hours of Peak Hour Excessive Delay Per Capita: Urbanized Area 1		24.5%		26.7%	
Percent of Non-Single Occupancy Vehicle (Non-SOV) Travel: Urbanized Area 1	36.6%	36.6%	36.9%	37.2%	
Total Emission Reductions: PM2.5					
Total Emission Reductions: NOx	5.369	9.068	3.744	4.230	
Total Emission Reductions: VOC	3.499	4.491	1.721	1.985	
Total Emission Reductions: PM10					
Total Emission Reductions: CO					

Overview

OVERVIEW SECTION 1

Question No	Description	Field Type
O1	Please provide a discussion on the effectiveness of the investment strategies developed and documented in the State asset management plan for the National Highway System (NHS) required under [23 CFR 490.107(b)(2)(ii)(C)].	With over 50,000 miles of roadway and over 20,000 bridges, the Virginia Department of Transportation (VDOT) is the third largest state-maintained transportation agency in the nation. Additionally, localities and others operate and maintain over 11,000 miles and over 140 bridges in the National Bridge Inventory. VDOT faces the same issues as other transportation agencies concerning aging infrastructure with limited resources to operate and maintain the overall network. In April 2018, VDOT submitted its initial Transportation Asset Management Plan (TAMP) to Federal Highway Administration (FHWA). This TAMP was certified by FHWA on July 27, 2018. An updated TAMP was provided in 2019. https//www.virginiadot.org/projects/resources/legstudies/2019_-_Final_TAMP.pdf In 2019, VDOT reported to Virginia's Governor, Secretary of Transportation, General Assembly, and Commonwealth Transportation Board (CTB) on long-term sustainability efforts related to existing highway transportation assets and services in Virginia. The report, the Maintenance and Operations Comprehensive Review (Comprehensive Review), is the result of a two-year effort focusing on development of an investment strategy to achieve long-term (at least 20 years) sustainable performance for existing assets such as pavements, bridges (structures), and 25 Special Structures as well as existing maintenance services, such as ditching, drainage repair, and tree removal. As a result of the Comprehensive Review, VDOT has moved toward a more balanced asset management approach to include the entire VDOT-maintained network. The effort to implement this strategy is underway. Maintenance and

		Operations Comprehensive Review - https//www.virginiadot.org/projects/resources/legstudies/Maintenance_and_Operations_Comprehensive_Review_%E2%80%93_2019.pdf VDOT takes a holistic approach to asset management and does not focus resources on a subset of the network. However, VDOT continues to deliver an asset management program consistent with the process reported in the 2019 TAMP and implementation is consistent with the requirements established by 23 U.S.C 119 and 23 CFR 515. This holistic approach allows Virginia to meet short-term performance targets while also managing for the future. Virginia has met all but one of its 2-year performance targets for asset condition—the exception being the percentage of bridge deck area in good condition, which is largely due to baseline data issues and a previous investment strategy focused on reducing the number of bridges in poor condition—and is positioned to achieve the 4-year targets. VDOT's approved TAMP and Comprehensive Review document VDOT's commitment to long-term sustainability of asset performance. VDOT projects that 10-year performance for pavement in good condition on the Interstate and Non-Interstate NHS will meet the current targets; similarly, 10-year performance for pavement in poor condition on the Interstate and Non-Interstate NHS will also meet the current targets. During the development of the pavement performance targets, performance targets for all rating factors and IRI-only were approved by the CTB and submitted in the last PMF to ensure all requirements were met. For bridges, the 4-year target for deck area of bridges in poor condition will remain at 3 percent and is projected to be met in 10 years. The 4-year target for deck area of bridges in good condition will be adjusted from 33 percent to

		30.5 percent, and VDOT projects to meet the new target by the end of 2021, helping to achieve anticipated performance by year 10.
O2	Please use this space to provide any general comments that may assist FHWA in its review of your submission. You can use this space to provide greater context for your targets and current condition/performance, provide additional background detail or clarification, note any assumptions, or discuss complications. This text may be shared verbatim online. (Optional)	OIPI and VDOT continue to work through issues related to data used in calculating a number of the federal asset condition (PM2) and system performance (PM3) measures. The specific issues are described in greater detail in the appropriate sections of this report; however, a brief summary is provided here - - Reporting delays due to inclusion of non-VDOT maintained bridges (federal and border bridges) in the calculation of the two bridge measures. - Annual TMC network changes within the NPMRDS dataset that make monitoring performance challenging, as statewide trends can reverse from year to year. This also complicates target-setting. - Use of IRI-only and Full Distress + IRI condition data for the pavement measures creates confusion in communicating performance to decision makers and the public. Virginia is using full distress condition data to set targets and monitor performance.

OVERVIEW SECTION 2

Question No	Description	Field Type
O3	Who should FHWA contact with questions?	Margie Ray
O4	What is the phone number for this contact? *Please provide 10-digit number (area code and phone number) without formatting. (e.g., 1234567890)*	8043714864
O5	What is the email address for this contact?	margie.ray@oipi.virginia.gov

Pavement

Pavement Performance Overview

Question No	Description	Field Type
P1	Please use this space to provide any general comments that may assist FHWA in its review of this part of the submission. You can use this space to provide greater context for your targets and current condition, provide additional background detail or clarification, note any assumptions, or discuss complications. This text may be shared verbatim online. (Optional)	As part of the Comprehensive Review, VDOT analyzed the condition of the pavements and funding strategies for the roadways it maintains. This review resulted in new statewide performance targets for the Interstate, primary, and secondary systems maintained by VDOT. Although not specifically designed for the purpose of meeting federal performance targets, this strategy is expected to help meet Virginia's current performance targets based on federal measures. It should be noted that VDOT maintains an extensive network of roads and NHS is a small part of it. Analysis was conducted and maintenance activities were developed for the entire network. As a part of the overall network, the NHS sections are expected to meet the performance targets. In the 2018 Baseline Performance Period Report, Virginia reported the 2- and 4-year targets for Non-Interstate NHS pavements based on all four distresses (cracking, IRI, rutting/faulting) to be consistent with target-setting for the Interstate measures - 2-Year Target for Non-Interstate NHS Pavement in Good Condition 25.0% 4-Year Target for Non-Interstate NHS Pavement in Good Condition 25.0% 2-Year Target for Non-Interstate NHS Pavement in Poor Condition 5.0% 4-Year Target for Non-Interstate NHS Pavement in Poor Condition 5.0% Virginia intends to continue reporting 2- and 4-year targets for Non-Interstate NHS pavement based on all four distresses, not IRI-only, to align with Interstate targets and provide a more comprehensive assessment of pavement condition to decision makers and the public. However,

		this report and the FHWA TPM Dashboard create challenges for communicating this information clearly by mixing IRI-only performance with full distress-based targets. Virginia will continue to work with FHWA to resolve this issue. In the meantime, here is an accurate comparison of 2-year condition to 2-year target for full distress - 2-Year Target for Non-Interstate NHS Pavement in Good Condition -- 25.0% 2-Year Actual for Non-Interstate NHS Pavement in Good Condition -- 36.7% 2-Year Target for Non-Interstate NHS Pavement in Poor Condition -- 5.0% 2-Year Actual for Non-Interstate NHS Pavement in Poor Condition -- 0.9%

Statewide Performance Target for the Percentage of Pavements on the Interstate System in Good Condition

Question No	Description	Field Type
P2	The 2-year statewide percentage of pavements on the Interstate System in Good condition. This value is the actual 2-year condition derived from the latest data collected through the midpoint of the performance period. [23 CFR 490.107(b)(2)(ii)(A)] *For the 2018-2021 Performance Period, this 2-year condition value will be used as the baseline value for this measure per the phase-in of new requirements for this measure. [23 CFR 490.105(e)(7)(iii)]*	57.9
P3	The 4-year target for the statewide percentage of pavements on the Interstate System in Good condition for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	45.0
P4	Does the State DOT wish to adjust the 4-year target for the statewide percentage of pavements on the Interstate System in Good condition? [23 CFR 490.105(e)(6)]	No
P4a	Please provide the adjusted 4-year target for the statewide percentage of pavements on the Interstate System in Good condition. The adjusted target should reflect expected condition by the end of Calendar Year 2021. This adjustment is only permitted in the MPP Progress Report. [23 CFR 490.105(e)(6) and 23 CFR 490.107(b)(2)(ii)(E)] *The adjusted target must be reported to the nearest tenth of a percent. For example, enter 86.5% as 86.5. [23 CFR 490.101 (Target definition) and 23 CFR 490.313(f)(2)]*	
P4b	Please provide the basis for adjustment of the 4-year target for the statewide percentage of pavements on the Interstate	

	System in Good condition and describe how the adjusted target supports expectations documented in longer range plans, such as the State asset management plan and the long-range statewide transportation plan. [23 CFR 490.107(b)(2)(ii)(E)]	

Statewide Performance Target for the Percentage of Pavements on the Interstate System in Poor Condition

Question No	Description	Field Type
P5	The 2-year statewide percentage of pavements on the Interstate System in Poor condition. This value is the actual 2-year condition derived from the latest data collected through the midpoint of the performance period. [23 CFR 490.107(b)(2)(ii)(A)] *For the 2018-2021 Performance Period, this 2-year condition value will be used as the baseline value for this measure per the phase-in of new requirements for this measure. [23 CFR 490.105(e)(7)(iii)]*	0.3
P6	The 4-year target for the statewide percentage of pavements on the Interstate System in Poor condition for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	3.0
P7	Does the State DOT wish to adjust the 4-year target for the statewide percentage of pavements on the Interstate System in Poor condition? [23 CFR 490.105(e)(6)]	No
P7a	Please provide the adjusted 4-year target for the statewide percentage of pavements on the Interstate System in Poor condition. The adjusted target should reflect expected condition by the end of Calendar Year 2021. This adjustment is only permitted in the MPP Progress Report. [23 CFR 490.105(e)(6) and 23 CFR 490.107(b)(2)(ii)(E)] *This adjusted target must be reported to the nearest tenth of a percent. For example, enter 86.5% as 86.5 [23 CFR 490.101 (Target definition) and 23 CFR 490.313(f)(3)]*	
P7b	Please provide the basis for adjustment of the 4-year target for the statewide percentage of pavements on the Interstate System in Poor condition and describe how the adjusted target supports expectations documented in longer range plans, such as the State asset management plan and the long-range statewide transportation plan. [23 CFR 490.107(b)(2)(ii)(E)]	

Statewide Performance Target for the Percentage of Pavements on the Non-Interstate NHS in Good Condition.

Question No	Description	Field Type
P8	The baseline statewide percentage of pavements on the Non-Interstate NHS in Good condition. This value is from the 2018 Baseline Performance Period Report, and is the condition derived from the latest data collected through the beginning date of the performance period. [23 CFR	54.5

	490.107(b)(1)(ii)(B)] *For the first performance period, FHWA calculated this value using IRI only (or PSR values for road sections where speed is less than 40 mph). [23 CFR 490.313(e)]*	
P9	The 2-year statewide percentage of pavements on the Non-Interstate NHS in Good condition. This value is the actual 2-year condition derived from the latest data collected through the midpoint of the performance period. [23 CFR 490.107(b)(2)(ii)(A)] *For the first performance period, FHWA calculated this value using IRI only (or PSR values for road sections where speed is less than 40 mph). [23 CFR 490.313(e)]*	54.4
P10	If the State DOT reported its 2-year target for the statewide percentage of pavements on the Non-Interstate NHS in Good condition based on "Full Distress + IRI" data in the 2018 Baseline Performance Period Report, FHWA has calculated an actual condition level using "Full Distress + IRI" data. [23 CFR 490.313 (c) and (d)] *When a State DOT reported the 2-year target based on "Full Distress + IRI" data, FHWA will use this value to determine whether the actual condition level is equal to or better than the established 2-year target as part of the 2-year significant progress determination. [23 CFR 490.109(e)(2)(ii)]*	36.7
P11	The 2-year target for the statewide percentage of pavements on the Non-Interstate NHS in Good condition for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	25.0
P12	Please provide a discussion of the progress made toward achieving the 2-year target for the statewide percentage of pavements on the Non-Interstate NHS in Good condition. At a minimum, this discussion should address overall progress as of the midpoint of the performance period, and shall include a comparison of the actual 2-year condition with the 2-year target and any reasons for differences in the actual and target values. [23 CFR 490.107(b)(2)(ii)(B) *For State DOTs that established a 2-year target using IRI only, the baseline value (P8), actual condition calculated with IRI only (P9), and the 2-year target (P11) all use the same metrics and can be compared to each other.* *State DOTs that established a 2-year target using "Full Distress + IRI" will see an actual condition value in both P9 and P10. These values must be used correctly in order to provide a meaningful discussion of progress. [23 CFR 490.107(b)(2)(ii)(B)]* *-The actual condition calculated with IRI only (P9) is ONLY comparable to the baseline value calculated with IRI only (P8).* *-The actual condition calculated with "Full Distress + IRI" (P10) is ONLY comparable to the State DOT's 2-year target established based on "Full distress + IRI" (P11).*	Performance at the mid period is exceeding the target, with the statewide percentage of pavements on the Non-Interstate NHS in Good condition based on full distress at 36.7 percent, which is higher than the full distress-based target of 25 percent. The results are as expected based on VDOT's maintenance strategy and funding. VDOT annually invests more than $400 million to improve pavement condition in accordance with the recommendations of the agency's Pavement Management System, the investment strategies of the Comprehensive Review, and performance levels projected in the TAMP. As part of the Comprehensive Review, VDOT analyzed the condition of the pavements and funding strategies for the roadways it maintains. This review resulted in new statewide performance targets for the Interstate, primary, and

		secondary pavements maintained by VDOT. Although not specifically designed for the purpose of meeting federal performance targets, this strategy is expected to help meet Virginia's current performance targets based on federal measures. It should be noted that VDOT maintains an extensive network of roads and NHS is a small part of it. Analysis was conducted and maintenance activities were developed for the entire network. As a part of the overall network, the NHS sections are expected to meet the performance targets
P13	The 4-year target for the statewide percentage of pavements on the Non-Interstate NHS in Good condition for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	25.0
P14	Does the State DOT wish to adjust the 4-year target for the statewide percentage of pavements on the Non-Interstate NHS in Good condition? [23 CFR 490.105(e)(6)]	No
P14a	Please provide the adjusted 4-year target for the statewide percentage of pavements on the Non-Interstate NHS in Good condition. The adjusted target should reflect expected condition by the end of Calendar Year 2021. This adjustment is only permitted in the MPP Progress Report. [23 CFR 490.105(e)(6) and 23 CFR 490.107(b)(2)(ii)(E)] *This adjusted target must be reported to the nearest tenth of a percent. For example, enter 86.5% as 86.5. [23 CFR 490.101 (Target definition) and 23 CFR 490.313(f)(4)]*	
P14b	Please provide the basis for adjustment of the 4-year target for the statewide percentage of pavements on the Non-Interstate NHS in Good condition and describe how the adjusted target supports expectations documented in longer range plans, such as the State asset management plan and the long-range statewide transportation plan. [23 CFR 490.107(b)(2)(ii)(E)]	
P15	Please provide a summary of prior accomplishments and planned activities that will be conducted during the remainder of the performance period to make significant progress toward achievement of the 4-year target for the statewide percentage of pavements on the Non-Interstate NHS in Good condition. [23 CFR 490.107(b)(2)(ii)(F)]	As part of the Comprehensive Review, VDOT analyzed the condition of the pavements and funding strategies for the roadways it maintains. This review resulted in new statewide performance targets for the Interstate, primary, and secondary systems maintained by VDOT. Although not specifically designed for the purpose of meeting federal performance targets, this strategy is expected to help meet Virginia's current

		performance targets based on federal measures. The Comprehensive Review moves Virginia toward a more balanced asset management approach to include the entire VDOT-maintained network. This investment strategy is intended to achieve long-term (at least 20 years) sustainable performance for pavements. The effort to implement this strategy is underway. The Comprehensive Review also aligns with Virginia's TAMP and the projected performance envisioned over the next 10 years. As a reminder, in the 2018 Baseline Performance Period Report, Virginia reported the 2- and 4-year targets for Non-Interstate NHS pavements based on all four distresses (cracking, IRI, rutting/faulting) to be consistent with target-setting for the Interstate measures - 4-Year Target for Non-Interstate NHS Pavement in Good Condition 25.0%
P16	Are there any extenuating circumstance(s) beyond the State DOT's control that prevented it from making significant progress toward achieving its 2-year target for the statewide percentage of pavements on the Non-Interstate NHS in Good condition? [23 CFR 490.107(b)(2)(ii)(G)]	No
P16a	Please select the extenuating circumstance(s) that apply. [23 CFR 490.109(e)(5)]	
P16b	Please explain the extenuating circumstance(s) beyond the State DOT's control that prevented it from making significant progress toward achieving its 2-year target for the statewide percentage of pavements on the Non-Interstate NHS in Good condition and quantify the impacts that resulted from these circumstances. [23 CFR 490.107(b)(2)(ii)(G)]	

Statewide Performance Target for the Percentage of Pavements on the Non-Interstate NHS in Poor Condition.

Question No	Description	Field Type
P17	The baseline statewide percentage of pavements on the Non-Interstate NHS in Poor condition. This value is from the 2018 Baseline Performance Period Report, and is the condition derived from the latest data collected through the beginning date of the performance period. [23 CFR 490.107(b)(1)(ii)(B)] *For the first performance period, FHWA calculated this value*	9.1

	using IRI only (or PSR values for road sections where speed is less than 40 mph). [23 CFR 490.313(e)]	
P18	The 2-year statewide percentage of pavements on the Non-Interstate NHS in Poor condition. This value is the actual 2-year condition derived from the latest data collected through the midpoint of the performance period. [23 CFR 490.107(b)(2)(ii)(A)] *For the first performance period, FHWA calculated this value using IRI only (or PSR values for road sections where speed is less than 40 mph). [23 CFR 490.313(e)]*	8.9
P19	If the State DOT reported its 2-year target for the statewide percentage of pavements on the Non-Interstate NHS in Poor condition based on "Full Distress + IRI" data in the 2018 Baseline Performance Period Report, FHWA has calculated an actual condition level using "Full Distress + IRI" data. [23 CFR 490.313 (c) and (d)] *When a State DOT reported the 2-year target based on "Full Distress + IRI" data, FHWA will use this value to determine whether the actual condition level is equal to or better than the established 2-year target as part of the 2-year significant progress determination. [23 CFR 490.109(e)(2)(ii)]*	0.9
P20	The 2-year target for the statewide percentage of pavements on the Non-Interstate NHS in Poor condition for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	5.0
P21	Please provide a discussion of the progress made toward achieving the 2-year target for the statewide percentage of pavements on the Non-Interstate NHS in Poor condition. At a minimum, this discussion should address overall progress as of the midpoint of the performance period, and shall include a comparison of the actual 2-year condition with the 2-year target and any reasons for differences in the actual and target values. [23 CFR 490.107(b)(2)(ii)(B)] *For State DOTs that established a 2-year target using IRI only, the baseline value (P8), actual condition calculated with IRI only (P9), and the 2-year target (P11) all use the same metrics and can be compared to each other.* *State DOTs that established a 2-year target using "Full Distress + IRI" will see an actual condition value in both P9 and P10. These values must be used correctly in order to provide a meaningful discussion of progress. [23 CFR 490.107(b)(2)(ii)(B)]* *-The actual condition calculated with IRI only (P9) is ONLY comparable to the baseline value calculated with IRI only (P8).* *-The actual condition calculated with "Full Distress + IRI" (P10) is ONLY comparable to the State DOT's 2-year target established based on "Full distress + IRI" (P11).*	Performance at the mid period is exceeding the target, with the statewide percentage of pavements on the Non-Interstate NHS in Poor condition based on full distress at 0.9 percent, which is lower (better) than the full distress-based target of 5 percent. The results are as expected based on VDOT's maintenance strategy and funding. VDOT annually invests more than $400 million to improve pavement condition in accordance with the recommendations of the agency's Pavement Management System, the investment strategies of the Comprehensive Review, and performance levels projected in the TAMP. As part of the Comprehensive Review, VDOT analyzed the condition of the pavements and funding strategies for the roadways it maintains. This review resulted in new statewide performance targets for the Interstate, primary, and secondary pavements maintained by VDOT. Although not specifically designed for the purpose of

		meeting federal performance targets, this strategy is expected to help meet Virginia's current performance targets based on federal measures. It should be noted that VDOT maintains an extensive network of roads and NHS is a small part of it. Analysis was conducted and maintenance activities were developed for the entire network. As a part of the overall network, the NHS sections are expected to meet the performance targets.
P22	The 4-year target for the statewide percentage of pavements on the Non-Interstate NHS in Poor condition for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	5.0
P23	Does the State DOT wish to adjust the 4-year target for the statewide percentage of pavements on the Non-Interstate NHS in Poor condition? [23 CFR 490.105(e)(6)]	No
P23a	Please provide the adjusted 4-year target for the statewide percentage of pavements on the Non-Interstate NHS in Poor condition. The adjusted target should reflect expected condition by the end of Calendar Year 2021. This adjustment is only permitted in the MPP Progress Report. [23 CFR 490.105(e)(6) and 23 CFR 490.107(b)(2)(ii)(E)] *This adjusted target must be reported to the nearest tenth of a percent. For example, enter 86.5% as 86.5 [23 CFR 490.101 (Target definition) and 23 CFR 490.313(f)(5)]*	
P23b	Please provide the basis for adjustment of the 4-year target for the statewide percentage of pavements on the Non-Interstate NHS in Poor condition and describe how the adjusted target supports expectations documented in longer range plans, such as the State asset management plan and the long-range statewide transportation plan. [23 CFR 490.107(b)(2)(ii)(E)]	
P24	Please provide a summary of prior accomplishments and planned activities that will be conducted during the remainder of the performance period to make significant progress toward achievement of the 4-year target for the statewide percentage of pavements on the Non-Interstate NHS in Poor condition. [23 CFR 490.107(b)(2)(ii)(F)]	As part of the Comprehensive Review, VDOT analyzed the condition of the pavements and funding strategies for the roadways it maintains. This review resulted in new statewide performance targets for the Interstate, primary, and secondary pavements maintained by VDOT. Although not specifically designed for the purpose of meeting federal performance targets, this strategy is expected to help meet Virginia's current performance targets based on federal measures.

		The Comprehensive Review moves Virginia toward a more balanced asset management approach to include the entire VDOT-maintained network. This investment strategy is intended to achieve long-term (at least 20 years) sustainable performance for pavements. The effort to implement this strategy is underway. The Comprehensive Review also aligns with Virginia's TAMP and the projected performance envisioned over the next 10 years. As a reminder, in the 2018 Baseline Performance Period Report, Virginia reported the 2- and 4-year targets for Non-Interstate NHS pavements based on all four distresses (cracking, IRI, rutting/faulting) to be consistent with target-setting for the Interstate measures - 4-Year Target for Non-Interstate NHS Pavement in Poor Condition 5.0%
P25	Are there any extenuating circumstance(s) beyond the State DOT's control that prevented it from making significant progress toward achieving its 2-year target for the statewide percentage of pavements on the Non-Interstate NHS in Poor condition for the 2018-2021 Performance Period? [23 CFR 490.107(b)(2)(ii)(G)]	No
P25a	Please select the extenuating circumstance(s) that apply. [23 CFR 490.109(e)(5)]	
P25b	Please explain the extenuating circumstance(s) beyond the State DOT's control that prevented it from making significant progress toward achieving its 2-year target for the statewide percentage of pavements on the Non-Interstate NHS in Poor condition and quantify the impacts that resulted from these circumstances. [23 CFR 490.107(b)(2)(ii)(G)]	

Bridge

Bridge Performance Overview

Question No	Description	Field Type
B1	Please use this space to provide any general comments that may assist FHWA in its review of this part of the submission. You can use this space to provide greater context for your targets and current condition, provide additional background detail or clarification, note any assumptions, or discuss complications. This text may be shared verbatim online. (Optional)	The inclusion of bridge data for which Virginia is not responsible continues to create accounting and tracking difficulties. Specifically, VDOT has had to adjust its bridge management database to accommodate the requirement that Virginia report data on federally-owned bridges and bridges owned by adjacent states. It continues to create an administrative burden and delays VDOT's evaluation of federal performance. VDOT supports the elimination of the requirement to report on border and federal bridges. VDOT is not responsible for these structures and does not wish to be penalized for the generally poorer condition of these structures. Additionally, VDOT has no convenient way to obtain current data for these structures, as we must reach out to adjacent states and the federal government for this information. Currently, VDOT obtains federal bridge data from the FHWA annual report. So VDOT obtains data from FHWA in order to report it back to FHWA. This causes significant time lags in our understanding of the performance data, since VDOT reports its annual bridge condition data to FHWA in March; however, VDOT does not receive complete information from FHWA on bridge condition for non-VDOT maintained structures until July.

Statewide Performance Target for Bridges on the NHS Classified as in Good Condition

Question No	Description	Field Type
B2	The baseline statewide percentage of deck area of bridges on the NHS classified as in Good condition. *This value is from the 2018 Baseline Performance Period Report, and is the condition derived from the latest data collected through the beginning date of the performance period. [23 CFR 490.107(b)(1)(ii)(B)]*	33.6
B3	The 2-year statewide percentage of deck area of bridges on the NHS classified as in Good condition. *This value is the actual 2-year condition derived from the latest data collected through the midpoint of the performance period. [23 CFR 490.107(b)(2)(ii)(A)]*	31.8
B4	The 2-year target for the statewide percentage of deck area	33.5

	of bridges on the NHS classified as in Good condition for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	
B5	Please provide a discussion of the progress made toward achieving the 2-year target for the statewide percentage of deck area of bridges on the NHS classified as in Good condition. *At a minimum, this discussion should address overall progress as of the midpoint of the performance period, and shall include a comparison of the actual 2-year condition achieved (based on data contained within the National Bridge Inventory as of June 15, 2020, and made available by FHWA) with the 2-year target and any reasons for differences in the actual and target values. [23 CFR 490.107(b)(2)(ii)(B)]*	Virginia's progress was approximately as expected, as the statewide bridge effort is focused primarily on rehabilitation of bridges in fair or poor condition rather than on replacement of NHS bridges, which is the primary mechanism for maintaining or increasing the deck area of bridges in Good condition on the NHS. While the overall percentage was lower than anticipated, this was due in part to baseline data issues - the VDOT database had a few errors, and border and federal bridges, when fully accounted for, created a shift in the baseline. The difference between the baseline and Year 2 was about what was anticipated. Reviewing previous and current investment strategies provides additional context for Virginia's 2-year performance. Leading up to this performance period, VDOT's investment strategy prioritized reducing the number of bridges in poor condition, reducing emphasis on maintaining bridges in good condition. Over the past two years, VDOT completed a comprehensive review of its maintenance and operations program, resulting in a shift in investment strategy. The new strategy supports a more balanced, sustainable program to manage performance over the next 20 years, focusing efforts on bridges on the cusp of falling into poor condition to prevent further deterioration.
B6	The 4-year target for the statewide percentage of deck area of bridges on the NHS classified as in Good condition for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	33.0
B7	Does the State DOT wish to adjust the 4-year target for the statewide percentage of deck area of bridges on the NHS classified as in Good condition? [23 CFR 490.105(e)(6)]	Yes
B7a	Please provide the adjusted 4-year target for the statewide percentage of deck area of bridges on the NHS classified as	30.5

	in Good condition. *The adjusted target should reflect expected condition by the end of Calendar Year 2021. This adjustment is only permitted in the MPP Progress Report. [23 CFR 490.105(e)(6) and 23 CFR 490.107(b)(2)(ii)(E)]* *This adjusted target must be reported to the nearest tenth of a percent. For example, enter 86.5% as 86.5 [23 CFR 490.101 (Target definition) and 23 CFR 490.409(c)(1)]*	
B7b	Please provide the basis for adjustment of the 4-year target for the statewide percentage of deck area of bridges on the NHS classified as in Good condition and describe how the adjusted target supports expectations documented in longer range plans, such as the State asset management plan and the long-range statewide transportation plan. [23 CFR 490.107(b)(2)(ii)(E)]	Virginia is adjusting the 4-year target for several reasons. - - Virginia's primary funding source for bridge maintenance, the State of Good Repair, is only available for bridges in poor condition, limiting VDOT's ability to maintain bridges in fair and good condition and prevent those structures from falling into worse condition. - Most bridge replacements since 2018 have been on Non-NHS routes. - VDOT is focused on preservation, restoration, and rehabilitation of bridges in fair and poor condition. - As described above, data issues --VDOT's database had a few errors and border and federal bridges, when fully accounted for, created a shift in the baseline--contributed to inflated performance conditions for the baseline year, which influenced how Virginia set its 2- and 4-year targets. In 2019, VDOT completed development of an investment strategy to achieve long-term (at least 20 years) sustainable performance for bridges (structures). As a result of the Comprehensive Review, Virginia has moved toward a more balanced asset management approach to include the entire VDOT-maintained network. Such an approach will enable a sustained program, allowing VDOT to focus limited resources on bridges in poor condition or n the cusp. The effort to implement this strategy is underway.
B8	Please provide a summary of prior accomplishments and planned activities that will be conducted during the remainder of the performance period to make significant progress toward achievement of the 4-year target for the statewide percentage of deck area of bridges on the NHS classified as in Good condition. [23 CFR 490.107(b)(2)(ii)(F)]	Virginia continues to execute its planned preventive maintenance program for good bridges, which includes sweeping, washing, overlays, and joint maintenance. Virginia currently has a significant number of large bridge replacement projects that are being delivered through expansive design-build and public-private

		partnership contracts. Many of these bridges are scheduled for completion prior to the 4-year reporting date, and will be a significant contributor to increasing the percentage of deck area of bridges on the NHS classified in Good condition.
B9	Are there any extenuating circumstance(s) beyond the State DOT's control that prevented it from making significant progress toward achieving its 2-year target for the statewide percentage of deck area of bridges on the NHS classified as in Good condition for the 2018-2021 Performance Period? [23 CFR 490.107(b)(2)(ii)(G)]	No
B9a	Please select the extenuating circumstance(s) that apply. [23 CFR 490.109(e)(5)]	
B9b	Please explain the extenuating circumstance(s) beyond the State DOT's control that prevented it from making significant progress toward achieving its 2-year target for the statewide percentage of deck area of bridges on the NHS classified as in Good condition and quantify the impacts that resulted from these circumstances. [23 CFR 490.107(b)(2)(ii)(G)]	

Statewide Performance Target for Bridges on the NHS Classified as in Poor Condition

Question No	Description	Field Type
B10	The baseline statewide percentage of deck area of bridges on the NHS classified as in Poor condition. *This value is from the 2018 Baseline Performance Period Report, and is the condition derived from the latest data collected through the beginning date of the performance period. [23 CFR 490.107(b)(1)(ii)(B)]*	3.5
B11	The 2-year statewide percentage of deck area of bridges on the NHS classified as in Poor condition. *This value is the actual 2-year condition derived from the latest data collected through the midpoint of the performance period. [23 CFR 490.107(b)(2)(ii)(A)]*	2.6
B12	The 2-year target for the statewide percentage of deck area of bridges on the NHS classified as in Poor condition for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	3.5
B13	Please provide a discussion of the progress made toward achieving the 2-year target for the statewide percentage of deck area of bridges on the NHS classified as in Poor condition. *At a minimum, this discussion should address overall progress as of the midpoint of the performance period, and shall include a comparison of the actual 2-year condition achieved (based on data contained within the National*	VDOT continues to address all bridges in its inventory, including NBI bridges on the NHS, in line with the investment strategy identified as a result of the Comprehensive Review. This investment strategy focuses on long-term, sustainable performance and includes an

	Bridge Inventory as of June 15, 2020, and made available by FHWA) with the 2-year target and any reasons for differences in the actual and target values. [23 CFR 490.107(b)(2)(ii)(B)]	emphasis on preventing bridges in fair condition from falling into poor condition. Several factors have contributed to the reduction in the percentage of deck area of bridges on the NHS classified as in Poor condition, including a steady, reliable funding stream. VDOT has had and will continue to have performance measures for the percentage of poor (structurally deficient) bridges on each highway system. These bridges are addressed through VDOT's trained bridge crews and by private contractors, paid through its State of Good Repair construction program, which is restricted to deficient bridges and pavements.
B14	The 4-year target for the statewide percentage of deck area of bridges on the NHS classified as in Poor condition for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	3.0
B15	Does the State DOT wish to adjust the 4-year target for the statewide percentage of deck area of bridges on the NHS classified as in Poor condition? [23 CFR 490.105(e)(6)]	No
B15a	Please provide the adjusted 4-year target for the statewide percentage of deck area of bridges on the NHS classified as in Poor condition. *The adjusted target should reflect expected condition by the end of Calendar Year 2021. This adjustment is only permitted in the MPP Progress Report. [23 CFR 490.105(e)(6) and 23 CFR 490.107(b)(2)(ii)(E)]* *This adjusted target must be reported to the nearest tenth of a percent. For example, enter 86.5% as 86.5 [23 CFR 490.101 (Target definition) and 23 CFR 490.409(c)(2)]*	
B15b	Please provide the basis for adjustment of the 4-year target for the statewide percentage of deck area of bridges on the NHS classified as in Poor condition and describe how the adjusted target supports expectations documented in longer range plans, such as the State asset management plan and the long-range statewide transportation plan. [23 CFR 490.107(b)(2)(ii)(E)]	
B16	Please provide a summary of prior accomplishments and planned activities that will be conducted during the remainder of the performance period to make significant progress toward achievement of the 4-year target for the statewide percentage of deck area of bridges on the NHS classified as in Poor condition. [23 CFR 490.107(b)(2)(ii)(F)]	VDOT continues to address all bridges in its inventory, including NBI bridges on the NHS. Several factors have contributed to the reduction in the percentage of deck area of bridges on the NHS classified as in Poor condition, including a steady, reliable funding

		stream. Virginia currently has a significant number of large bridge replacement projects that are being delivered through expansive design-build and public-private partnership contracts. Many of these bridges are scheduled for completion prior to the 4-year reporting date, and will be a significant contributor to increasing the percentage of deck area of bridges on the NHS classified in Good condition.
B17	Are there any extenuating circumstance(s) beyond the State DOT's control that prevented it from making significant progress toward achieving its 2-year target for the statewide percentage of deck area of bridges on the NHS classified as in Poor condition for the 2018-2021 Performance Period? [23 CFR 490.107(b)(2)(ii)(G)]	No
B17a	Please select the extenuating circumstance(s) that apply. [23 CFR 490.109(e)(5)]	
B17b	Please explain the extenuating circumstance(s) beyond the State DOT's control that prevented it from making significant progress toward achieving its 2-year target for the statewide percentage of deck area of bridges on the NHS classified as in Poor condition and quantify the impacts that resulted from these circumstances. [23 CFR 490.107(b)(2)(ii)(G)]	

Reliability

Travel Time Reliability Performance Overview

Question No	Description	Field Type
R1	Please use this space to provide any general comments that may assist FHWA in its review of this part of the submission. You can use this space to provide greater context for your targets and current performance, provide additional background detail or clarification, note any assumptions, or discuss complications. This text may be shared verbatim online. (Optional)	In general, OIPI and VDOT find that it is helpful to measure reliability in a systematic format for the identification of hot spots and the review of progress. The federal measure provides limited insight into the performance of various investments and strategies; thus, VDOT continued to explore other measures better suited for monitoring performance. At this time, the federal measure lends itself best to exploring changes on corridors within time periods to assess performance. With respect to target setting and monitoring performance, NPMRDS data issues and map changes complicate these efforts. Data issues and resulting effects are described here and in fields below - - Having only two years of baseline data (2016-2017) from which to set a target and not having a complete understanding of how various projects and strategies affect the Level of Travel Time Reliability; - TMC network changes can result in an imprecision that makes target setting and monitoring performance very challenging, as data and map issues can reverse a trend from year to year; and - Metrics should not be reported to the hundredths place, but as integers; reporting to the hundredths place provides a false sense of accuracy. Until the data and map segments have stabilized, statewide and MPO target setting may result in a misrepresentation of conditions.

Statewide Performance Target for the Percent of the Person-Miles Traveled on the Interstate That Are Reliable

Question No	Description	Field Type
R2	The baseline statewide percent of the person-miles traveled on the Interstate that are reliable. *This value is from the 2018 Baseline Performance Period Report, and is the condition derived from the latest data collected through the beginning date of the performance period. [23 CFR 490.107(b)(1)(ii)(B)]*	84.3

R3	The 2-year statewide percent of the person-miles traveled on the Interstate that are reliable. *This value is the actual 2-year condition derived from the latest data collected through the midpoint of the performance period. [23 CFR 490.107(b)(2)(ii)(A)]*	83.6
R4	The 2-year target for the statewide percent of the person-miles traveled on the Interstate that are reliable for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	82.2
R5	Please provide a discussion of the progress made toward achieving the 2-year target for the statewide percent of the person-miles traveled on the Interstate that are reliable. *At a minimum, this discussion should address overall progress as of the midpoint of the performance period, and shall include a comparison of the actual 2-year performance with the 2-year target and any reasons for differences in the actual and target values. [23 CFR 490.107(b)(2)(ii)(B)]*	Having only two years of data from which to set a target and not having a complete understanding of how various projects and strategies affect the Level of Travel Time Reliability, Virginia was cautiously optimistic that its efforts to reduce congestion and improve reliability would increase the percent of person miles traveled on the interstate that are reliable. Virginia was also aware that the many construction projects planned for key corridors over the target period might negatively impact the corridor's reliability. Although the target represented a slight decrease in performance, it was less of a decrease than the 2-year trend represented. Virginia has exceeded its 2-year target by reaching a performance of 83.6 percent reliability on the interstates. As to be expected, most areas of unreliability lie in more populated urban areas. Northern Virginia hot spots include I-95 between Fredericksburg and DC and I-66 inside and outside the Beltway. Many of these remain areas of low reliability in 2019 with some slight improvements noted. On I-95 southbound, there is less unreliability near mile marker 143, Garrisonville Road, which is likely due to the expansion of the Express Lanes approximately 2 miles further south. This reduces the spillback queue into the general purpose lanes as the Express Lanes end and merge into the general flow. Additional improvements are anticipated as these Express Lanes are extended another 10 miles to Route 17 in Fredericksburg.

		Hot spots of unreliability in the Hampton Roads area are scattered throughout the urban area with concentration on I-64 westbound and eastbound approaching the Hampton Roads Bridge Tunnel. Although many of the hot spots remained the same from 2017 to 2019, two hot spots on I-64 on the peninsula have been eliminated with the widening by one lane and one shoulder lane in each direction which was completed in December of 2017.
R6	The 4-year target for the statewide percent of the person-miles traveled on the Interstate that are reliable for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	82.0
R7	Does the State DOT wish to adjust the 4-year target for the statewide percent of the person-miles traveled on the Interstate that are reliable? [23 CFR 490.105(e)(6)]	No
R7a	Please provide the adjusted 4-year target for the statewide percent of the person-miles traveled on the Interstate that are reliable. *The adjusted target should reflect expected condition by the end of Calendar Year 2021. This adjustment is only permitted in the MPP Progress Report. [23 CFR 490.105(e)(6) and 23 CFR 490.107(b)(2)(ii)(E)]* *This adjusted target must be reported to the nearest tenth of a percent. For example, enter 86.5% as 86.5 [23 CFR 490.101 (Target definition) and 23 CFR 490.513(b)]*	
R7b	Please provide the basis for adjustment of the 4-year target for the statewide percent of the person-miles traveled on the Interstate that are reliable and describe how the adjusted target supports expectations documented in longer range plans, such as the State asset management plan and the long-range statewide transportation plan. [23 CFR 490.107(b)(2)(ii)(E)]	
R8	Please provide a summary of prior accomplishments and planned activities that will be conducted during the remainder of the performance period to make significant progress toward achievement of the 4-year target for the statewide percent of the person-miles traveled on the Interstate that are reliable. [23 CFR 490.107(b)(2)(ii)(F)]	Virginia is on track to meet its 4-year target, and future efforts will focus on safety, operational, and demand management strategies to minimize the impact of work zones, crashes, and other incidents on the variability of travel time. Although smaller construction projects will be completed within the next two years, these are either not in areas of high unreliability currently or are expected to provide a minimal improvement in unreliability.

		There are many additional projects that will be completed after the end of 2021 and their impact on reliability will be felt later. These include the extension of the I-95 Express lanes 10 miles south to Fredericksburg, extension of the I-495 Express lanes north, replacement of the American Legion Bridge, addition of another tube at the Hampton Roads Bridge Crossing, and other travel demand management and operational improvements.
R9	Are there any extenuating circumstance(s) beyond the State DOT's control that prevented it from making significant progress toward achieving its 2-year target for the statewide percent of the person-miles traveled on the Interstate that are reliable for the 2018-2021 Performance Period. [23 CFR 490.107(b)(2)(ii)(G)]	No
R9a	Please select the extenuating circumstance(s) that apply. [23 CFR 490.109(e)(5)]	
R9b	Please explain the extenuating circumstance(s) beyond the State DOT's control that prevented it from making significant progress toward achieving its 2-year target for the statewide percent of the person-miles traveled on the Interstate that are reliable and quantify the impacts that resulted from these circumstances. [23 CFR 490.107(b)(2)(ii)(G)]	

Statewide Performance Target for the Percent of the Person-Miles Traveled on the Non-Interstate NHS That Are Reliable

Question No	Description	Field Type
R10	The 2-year statewide percent of the person-miles traveled on the non-Interstate NHS that are reliable. *This value is the actual 2-year performance derived from the latest data collected through the midpoint of the performance period. [23 CFR 490.107(b)(2)(ii)(A)]* *For the 2018-2021 Performance Period, this 2-year performance value will be used as the baseline value for this measure per the phase-in of new requirements for this measure. [23 CFR 490.105(e)(7)(iii)]*	88.9
R11	The 4-year target for the statewide percent of the person-miles traveled on the non-Interstate NHS that are reliable for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	82.5
R12	Does the State DOT wish to adjust the 4-year target for the statewide percent of the person-miles traveled on the non-Interstate NHS that are reliable? [23 CFR 490.105(e)(6)]	No

R12a	Please provide the adjusted 4-year target for the statewide percent of the person-miles traveled on the non-Interstate NHS that are reliable. *The adjusted target should reflect expected performance by the end of the Calendar Year 2021. This adjustment is only permitted in the MPP Progress Report. [23 CFR 490.105(e)(6) and 23 CFR 490.107(b)(2)(ii)(E)]* *This adjusted target must be reported to the nearest tenth of a percent. For example, enter 86.5% as 86.5 [23 CFR 490.101 (Target definition) and 23 CFR 490.513(c)]*	
R12b	Please provide the basis for adjustment of the 4-year target for the statewide percent of the person-miles traveled on the non-Interstate NHS that are reliable and describe how the adjusted target supports expectations documented in longer range plans, such as the State asset management plan and the long-range statewide transportation plan. [23 CFR 490.107(b)(2)(ii)(E)]	

Freight

Freight Reliability (Movement) Performance Overview

Question No	Description	Field Type
F1	Please use this space to provide any general comments that may assist FHWA in its review of this part of the submission. You can use this space to provide greater context for your targets and current performance, provide additional background detail or clarification, note any assumptions, or discuss complications. This text may be shared verbatim online. (Optional)	Due to some challenges with data variability and network changes each year, Virginia has taken the following actions when calculating the truck travel time reliability index for interstates - Eliminated all the TMCs inside truck restricted interstate route, e.g., I-66 inside the Beltway; - Used the latest NPMRDS TMC network file (version 2019) to calculate truck travel time reliability index and also recalculated all the previous year TTTR measures from 2016 to 2018 to make sure that VDOT was using consistent network data; - Used only TMCs existing all four years between 2016 and 2019 from the network and NPMRDS raw data. This minimizes the uncertainty in trend analysis from different data sources. Once more years of data are available, VDOT can shift the 4-year window to the recent year, e.g., between 2018 and 2021; - Eliminated TMCs overlapped with different route names but physically on the same roads from the TTTR measure calculation; Followed FHWA's rounding rules; and - Worked closely with the FHWA GIS team to maintain MPO boundary data and used the latest MPO shapefile. It should be noted that VDOT and RITIS use different methods to assign TMCs crossing multiple MPOs. Since VDOT is utilizing its own methodology to calculate TTTR measures, the measure outputs will be different from the outputs from RITIS. VDOT can provide the list of TMCs used in TTTR measure calculation and source codes upon request.
F2	Please discuss progress of the State DOT's efforts in addressing congestion at truck freight bottlenecks within the State (described in § 490.107(b)(1)(ii)(E)) through comprehensive freight improvement efforts of State Freight Plan or MPO freight plans; the Statewide Transportation Improvement Program and Transportation Improvement Program; regional or corridor level efforts; other related planning efforts; and operational and capital activities	Please see the attachment "Truck Freight Bottleneck Reporting for 2020 PMF" for more details on Virginia's efforts to address congestion at truck freight bottlenecks. SUMMARY Reducing the number and severity of freight bottlenecks

	targeted to improve freight movement on the Interstate System. *If the State has prepared a State Freight Plan under 49 U.S.C. 70202, within the previous 2 years, then it may serve as the basis for addressing congestion at truck freight bottlenecks. If the State Freight Plan has not been updated since the previous State Biennial Performance Report, then an updated analysis of congestion at truck freight bottlenecks must be completed. [23 CFR 490.107(b)(2)(ii)(D)]* *Please upload related document(s) in the "Attachment" tab.*	is an objective in Virginia's State Freight Plan, which is consistent with the state's long-range transportation plan, VTrans2040. The measure related to this objective identifies truck freight bottlenecks through an assessment of average ton hours of delay per mile. It is intended to track the locations where truck traffic is significantly delayed in the state. The official definition of the measure is the "number of highway bottlenecks with daily freight ton hours of delay per mile > 250,000." Using this definition and three sources of data, Transearch from IHS Markit, speed from INRIX, and traffic counts from VDOT, Virginia identified 37 truck freight bottlenecks in the state. To understand current conditions at the 37 truck freight bottlenecks, VDOT and OIPI analyzed each identified bottleneck and compared the baseline (2017) and recent-year (2019) planning time index (PTI), buffer time index (BTI), and travel time index (TTI) for these locations. The results show improvement in PTI at 25 locations, or 68 percent of the bottlenecks; in BTI at 28 locations, or 78 percent; and in TTI at 26 locations, or 70 percent, respectively. It is important to note that OIPI is currently updating the state's long-range transportation plan, VTrans. Working in partnership with VDOT, the Department of Rail and Public Transportation, the Port of Virginia, the Department of Aviation, and FHWA, OIPI is beginning work on a state freight plan, the VTrans Freight Element, which will be developed to meet 49 U.S.C. 70202 (FAST Act State Freight Plans). This effort will include identification of truck freight bottlenecks, and Virginia will update FHWA on the methodology used to identify bottlenecks in a future performance report. SOLUTIONS - Virginia's Freight Investment Plan includes 44 projects, totaling $421 million; this includes 23 projects with construction completed, 13 with construction underway, and 8 with construction pending. In addition to the Freight Investment Plan and use of the National Highway

		Freight Program Funds, Virginia is making significant investments to the National Highway System to improve freight bottlenecks and reliability. The Commonwealth has put in place an I-81 Corridor Improvement Fund (Fund) for revenues raised from a mix of truck registration fees, diesel and road taxes, and a regional fuels tax. The Fund supports the I-81 Corridor Improvement Program, which consists of innovative, targeted improvements that will have a substantial effect on the safety and reliability of the corridor. VDOT's Interstate 81 Corridor Operations Expansion Program (Program) is a national finalist in the 13th annual America's Transportation Awards competition sponsored by the American Association of State Highway and Transportation Officials, AAA, and the U.S. Chamber of Commerce. With more than $853 million in funds allocated to projects on the I-81 corridor, the Program implements operational improvements including traffic cameras, changeable message signs, curve warning systems, additional Safety Service Patrol resources, and innovative towing programs. Virginia's transportation project prioritization process SMART SCALE, evaluates and scores projects in six factor areas, including economic development and environmental quality. The economic development factor includes an intermodal access and efficiency measure by which projects are rated on the extent to which the project is deemed to enhance access to freight intensive industries, including intermodal locations, and supports increased efficiency for freight movement on the National Freight Network or reduces congestion at or adjacent to Virginia ports and airports. Projects may receive 0-6 points for this measure, and those points are multiplied (scaled) by total freight tonnage and scaled by the length of the project. The environmental quality factor includes an air quality and energy environmental affect

		measure. Projects are rated on the potential to improve air quality and reduce greenhouse emissions to the extent the project reduces delay where there is a high percentage of truck traffic (greater than 8 percent of AADT) and the extent to which the project includes truck to rail improvements. Projects may receive 1.5 points for this measure and those points are multiplied by daily truck volume. In addition to freight specific measures, projects are also evaluated and scored on congestion and safety which will also benefit freight movement. Access to the SMART SCALE program is a competitive application program conducted every other year. Examples of projects funded as a result of the SMART SCALE prioritization process include widening of the bridges over the Rappahannock River on I-95 to increase capacity and improve reliability. The 2020 General Assembly session established the Interstate Operations and Enhancement Program. Special attention is given to truck travel on Interstates as part of the Interstate Operations and Enhancement Program, with a certain amount of funds required to be used for Interstate corridors with more than 10 percent of Interstate truck vehicle miles traveled. Access to the Interstate Operations and Enhancement Program will be based on a project prioritization process modeled after SMART SCALE. Additionally, these funds may only be used to address a need identified in VTrans or a Commonwealth Transportation Board-adopted Interstate corridor plan, which are described below in greater detail. Currently, this funding program supports more than $74 million in operational improvements on the I-95 corridor, including ramp metering, innovative towing programs, and Safety Service Patrol resources, among others. Regional funding programs in Northern Virginia and Hampton Roads, along with public-private

		partnerships, are making significant investments on the Interstate system, including many improvements on I-95 in the Fredericksburg and Northern Virginia regions, as well as widening of I-64 in the Hampton Roads region to include the Hampton Roads Bridge-Tunnel and the High Rise Bridge (funded with regional and SMART SCALE programs). Expansion of the Hampton Roads Bridge-Tunnel is underway and will provide significant benefits to freight movement and improve connections with the Port of Virginia. This $3.8 billion investment is funded through a public-private partnership supported by regional, state, and federal funds. Projects funded through the above-referenced programs are included in both the Statewide Transportation Improvement Program (FFY 2018-2021) and Virginia's capital improvement program, the Six-Year Improvement Program (SYIP). Virginia's current SYIP includes $1.4 billion in Interstate corridor funds, with more than half of the funds supporting 60 active projects on I-81 aimed at improving operations along this significant freight corridor. These programmed investments, several of which will be completed by 2021, will aid in improving freight reliability in Virginia. To better understand the needs and potential solutions, Virginia is also in the process of completing corridor improvement plans for its Interstate highways, where 28 of the state's 37 truck freight bottlenecks are located. These plans are designed to identify a package of targeted operational, multimodal, and capital improvements that are expected to deliver faster, safer, and more reliable travel on interstates throughout Virginia. To date, OIPI, VDOT, and DRPT have completed an I-81 Corridor Improvement Plan and the I-95 Interim Corridor Improvement Plan, and improvements are underway on the

		I-81 corridor, such as increased safety service patrol routes and curve improvements. Additional analysis is ongoing for the I-95 corridor and I-64/664 corridor. Preliminary results from the I-64/664 study were presented publicly in July 2020, and a public comment period is underway. The targeted solutions identified through these studies will be eligible for the new funding source via the Interstate Operations and Enhancement Program. I-81 Corridor Improvement Plan -- www.improve81.org/resources-and-documents/easset-upload-file70998-154776-e.pdf I-95 Interim Corridor Improvement Plan -- www.ctb.virginia.gov/projects/major_projects/easset_upload_file65013_141080_e.pdf I-64/664 Corridor Improvement Study -- www.i-64-664publicinfo.com/

Statewide Performance Target for the Truck Travel Time Reliability (TTTR) Index

Question No	Description	Field Type
F3	The baseline statewide Truck Travel Time Reliability Index. *This value is from the 2018 Baseline Performance Period Report and is the performance derived from the latest data collected through the beginning date of the performance period. [23 CFR 490.107(b)(1)(ii)(B)]*	1.48
F4	The 2-year statewide Truck Travel Time Reliability Index. *This value is the actual 2-year condition derived from the latest data collected through the midpoint of the performance period. [23 CFR 490.107(b)(2)(ii)(A)]*	1.55
F5	The 2-year target for the statewide Truck Travel Time Reliability Index for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	1.53
F6	Please provide a discussion of the progress made toward achieving the 2-year target for the statewide Truck Travel Time Reliability Index. *At a minimum, this discussion should address overall progress as of the midpoint of the performance period, and shall include a comparison of the actual 2-year performance with the 2-year target and any reasons for differences in the actual and target values. [23 CFR 490.107(b)(2)(ii)(B)]*	VDOT has conducted numerous interstate corridor improvement projects and plans to continue over the next years to improve congestion and safety, and improving freight movement is a major component. The high volume of construction on Interstate improvements in recent years (2017 to 2019, specifically) hinders performance in the short-term due to lane closures and other construction impacts. However,

		VDOT expects performance to improve over the long-term, including the final years of this first performance period (2020-2021), as construction is completed, such as the recent widenings of segments of I-64 between Richmond and Hampton Roads. - Major construction projects also complicate estimating targets correctly and evaluating the 2-year and 4-year targets reasonably. For example, based on a sensitivity analysis on the statewide TTTR measure, VDOT found that a small number of TMC segments having large TTTR index could impact the statewide TTTR index greatly; for example, without the top 10 worst locations, the statewide TTTR went down from 1.54 to 1.5, which is a 3 percent improvement. - Despite these limitations, VDOT narrowly missed meeting the 2-year target and remains on track to meet the 4-year target. As a reminder, Virginia used a linear trend analysis of 2016 and 2017 data to set the 2-year target; the trend analysis projected worsening conditions for the TTTR Index at the statewide level due to increasing freight volume, and the target was set to not exceed the projected trend. - Please see F2 for more details on Virginia's efforts to improve freight movement.
F7	The 4-year target for the statewide Truck Travel Time Reliability Index for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	1.56
F8	Does the State DOT wish to adjust the 4-year target for the statewide Truck Travel Time Reliability Index? [23 CFR 490.105(e)(6)]	No
F8a	Please provide the adjusted 4-year target for the statewide Truck Travel Time Reliability Index. *The adjusted target should reflect expected performance by the end of Calendar Year 2021. This adjustment is only permitted in the Mid Performance Period Progress Report. [23 CFR 490.107(b)(2)(ii)(E)]* *This adjusted target must be reported to the nearest hundredth. For example, enter 2.54. [23 CFR 490.101 (Target definition) and 23 CFR 490.613(b)]*	
F8b	Please provide the basis for adjustment of the 4-year target for the statewide Truck Travel Time Reliability Index and	

	describe how the adjusted target supports expectations documented in longer range plans, such as the State asset management plan and the long-range statewide transportation plan. [23 CFR 490.107(b)(2)(ii)(E)]	
F9	Please provide a summary of prior accomplishments and planned activities that will be conducted during the remainder of the performance period to make significant progress toward achievement of the 4-year target for the statewide Truck Travel Time Reliability Index. [23 CFR 490.107(b)(2)(ii)(F)]	VDOT will continue to promote improvement (capacity expansion, ITS operation and maintenance, safety, and multimodal) programs to minimize congestion and improve travel time reliability (see F2 for more information). As mentioned earlier (F6), there will be a short-term disadvantage from construction activities, but benefits from improvement projects are expected over the long term. - Virginia's Freight Investment Plan includes 44 projects, totaling $421 million; this includes 23 projects with construction completed, 13 with construction underway, and 8 with construction pending. Additionally, there are other programmed projects included in the state's transportation improvement program (STIP) that once completed will improve freight reliability on the National Highway System. Some of these projects are funded as a result of the SMART SCALE prioritization process referenced above and include such projects as widening of the bridges over the Rappahannock River on I-95 to increase capacity. Other projects may be funded through regional funding or Public Private Partnerships, such as widening of I-64 in the Hampton Roads region to include the Hampton Roads Bridge Tunnel, a known freight bottleneck. These programmed investments, several of which will be completed by 2021, will aid in improving freight reliability in Virginia. - VDOT works with other entities to develop performance monitoring systems and to create target setting methodologies. Once more travel time data are available and network data gets better, VDOT expects that systems and methodologies will be stable so that more accurate target setting is available. Plus, a better systematic monitoring process will be applicable.
F10	Are there any extenuating circumstance(s) beyond the State DOT's control that prevented it from making significant	No

	progress toward achieving its 2-year target for the statewide Truck Travel Time Reliability Index for the 2018-2021 Performance Period? [23 CFR 490.107(b)(2)(ii)(G)]	
F10a	Please select the extenuating circumstance(s) that apply. [23 CFR 490.109(e)(5)]	
F10b	Please explain the extenuating circumstance(s) beyond the State DOT's control that prevented it from making significant progress toward achieving its 2-year target for the statewide Truck Travel Time Reliability Index and quantify the impacts that resulted from these circumstances. [23 CFR 490.107(b)(2)(ii)(G)]	

Peak Hour Excess Delay (PHED)

Annual Hours of Peak Hour Excessive Delay (PHED) Per Capita Performance Overview

Question No	Description	Field Type
D1	Please use this space to provide any general comments that may assist FHWA in its review of this part of the submission. You can use this space to provide greater context for your targets and current performance, provide additional background detail or clarification, note any assumptions, or discuss complications. This text may be shared verbatim online. (Optional)	Extensive coordination was conducted in 2018 to develop the four-year target for annual PHED for the Washington, DC-MD-VA urbanized area. Three state departments of transportation and three metropolitan planning organizations were involved in developing a forecast for performance in 2021 and 4-year target. VDOT met regularly and often with subject-matter experts and applicable personnel from the MPOs and other state departments of transportation. Communication between the parties remained constant and transparent. Roles and expectations of all parties were established with letters of agreement on respective responsibilities for performance planning. The 4-year PHED target for the Washington, DC-MD-VA UZA was reflective of the expected population and job growth forthcoming in the region, as well as the completion of significant public transportation and road infrastructure projects. At that time, the PHED measure was expected to increase (worsen) over time with continued growth in travel versus available road capacity. Performance in the past two years – 2018 and 2019 – has been better than projections. The PHED measure continued to increase in 2018, but by less than anticipated. The PHED measure then decreased in 2019. Recently completed programmed projects, including expansion of the HOT (Express Lane) network, and improved traveler information provide alternative travel options in the region, contributing to less peak hour excessive delay. Accordingly, the expectation is that the 4-year target will be met, with PHED coming in at less than forecast in 2018.
D2	The total number of applicable UZA(s) required to establish targets and report progress for the Traffic Congestion Measures in your State are:	1

Urbanized Area Target #1 - Annual Hours of Peak Hour Excessive Delay Per Capita

Question No	Description	Field Type
D3	Urbanized Area:	Washington, DC--VA--MD
D4	The 2-year annual hours of peak hour excessive delay per capita in this UZA. This value is the actual 2-year performance derived from the latest data collected through the midpoint of the performance period. [23 CFR 490.107(b)(2)(ii)(A)] *For the 2018-2021 Performance Period, this 2-year performance value will be used as the baseline value for this measure for this UZA per the phase-in of new requirements. [23 CFR 490.105(e)(8)(vi)(C) and 23 CFR 490.105(f)(5)(vi)(B)]*	24.5
D5	The 4-year target for the annual hours of peak hour excessive delay per capita in this UZA for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Report. [23 CFR 490.107(b)(1)(ii)(A)] and [23 CFR 490.107(c)(3)(ii)(A)]	26.7
D6	Does the State DOT wish to adjust the 4-year target for the annual hours of peak hour excessive delay per capita in this UZA? [23 CFR 490.105(e)(6)]	No
D6a	Please provide the adjusted 4-year target for the annual hours of peak hour excessive delay per capita in this UZA. *Any adjustments made to 4-year targets established for this measure must be agreed upon and made collectively by all relevant State DOTs and MPOs. [23 CFR 490.105(e)(6)]* *The adjusted target should reflect expected performance by the end of Calendar Year 2021. This adjustment is only permitted in the Mid Performance Period Progress Report. [23 CFR 490.107(b)(2)(ii)(E) and 23 CFR 490.105(f)(8)]* *This adjusted target must be reported to the nearest tenth. For example, enter 7.1. [23 CFR 490.101 (Target definition) and 23 CFR 490.713(b)]*	
D6b	Please provide the basis for adjustment of the 4-year target for the annual hours of peak hour excessive delay per capita in this UZA and describe how the adjusted target supports expectations documented in longer range plans, such as the State asset management plan and the long-range statewide transportation plan. [23 CFR 490.107(b)(2)(ii)(E)]	

Percent of Non-SOV Travel

Percent of Non-Single Occupancy Vehicle (Non-SOV) Travel Performance Overview

Question No	Description	Field Type
T1	Please use this space to provide any general comments that may assist FHWA in its review of this part of the submission. You can use this space to provide greater context for your targets and current performance, provide additional background detail or clarification, note any assumptions, or discuss complications. This text may be shared verbatim online. (Optional)	Extensive coordination was done with the development of the two and four-year targets for Non-SOV Travel. In the case of the Washington, DC-MD-VA urbanized area, VDOT met regularly and often with subject matter experts and applicable personnel from the MPOs and other state departments of transportation. Roles and expectations of all parties were established with letters of agreement on responsibilities for performance planning. The Non-SOV targets for the Washington, DC-MD-VA UZA are reflective of the expected population and job growth forthcoming in the region, as well as the completion of significant public transportation and road infrastructure projects. Since 2016, the non-SOV travel performance has remained constant, neither increasing nor decreasing in 2017 or 2018. State DOTs and the TPB remain committed to providing alternatives to non-SOV travel. The Commuter Connections regional network of transportation organizations works to improve commutes in the Washington, DC metropolitan area with a variety of services and programs to assist employers and commuters with making alternative choices about their commuting needs, including ridematching, transit, bicycling, teleworking, and incentive programs. Additionally, in 2021 the opening of the extension of the WMATA Metrorail Silver Line to Dulles Airport and Loudoun County should offer a significant new opportunity for alternative travel.
T2	The total number of applicable UZA(s) required to establish targets and report progress for the Traffic Congestion Measures in your State are:	1

Urbanized Area Target #1 - Percent of Non-Single Occupancy Vehicle (Non-SOV) Travel

Question No	Description	Field Type
T3	Urbanized Area:	Washington, DC--VA--MD

T4	The baseline percent of Non-SOV travel. *This value is from the 2018 Baseline Performance Period Report and is the performance derived from the latest data collected through the beginning date of the performance period. [23 CFR 490.107(b)(1)(ii)(B)]*	36.6
T5	The 2-year percent of Non-SOV travel. *This value is the actual 2-year performance. [23 CFR 490.107(b)(2)(ii)(A) and [23 CFR 490.107(c)(3)(iii)(A)]* *Since the baseline performance submitted in the 2018 Baseline Performance Period Report was based on Method A, the 2-year performance value is based on Method A – American Community Survey (ACS). [23 CFR 490.709 (f)(2) and (3)]*	36.6
T6	The 2-year target for the percent of Non-SOV travel for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	36.9
T7	Please provide a discussion of the progress made toward achieving the 2-year target for the percent of Non-SOV travel. *At a minimum, this discussion should address overall progress as of the midpoint of the performance period, and shall include a comparison of the actual 2-year performance with the 2-year target and any reasons for differences in the actual and target values. [23 CFR 490.107(b)(2)(ii)(B)]*	In 2018, when the 2-year and 4-year targets were developed, the expectation was that the percentage of non-SOV travel would very slowly increase (improve) at a rate of 0.1 percent per year. Instead, the non-SOV percentage has remained constant for three years at 36.6 percent. The 2-year target was therefore not met. Possible reasons for the lack of progress in the measure and not meeting the 2-year target include - 1) Gas prices have fallen and stayed low, which encourages driving; 2) Car ownership is up, particularly for low-income households now having access to at least one vehicle; and 3) While trends in public transportation ridership appeared to be finally recovering just before the pandemic, ridership had been below projections at WMATA and other transit systems for several years with the growth in TNC/ride-hailing services being one factor that has affected transit ridership. The long-term impacts of the pandemic on telework and travel choices is unforeseeable at this time. Without an evidence-based set of data on which to project future travel impacts, the State DOTs and the TPB will retain the previously established 4-year target for non-SOV travel.

		State DOTs and the TPB remain committed to providing alternatives to non-SOV travel. The Commuter Connections regional network of transportation organizations works to improve commutes in the Washington, DC metropolitan area with a variety of services and programs to assist employers and commuters with making alternative choices about their commuting needs, including ridematching, transit, bicycling, teleworking, and incentive programs. Additionally, in 2021 the opening of the extension of the WMATA Metrorail Silver Line to Dulles Airport and Loudoun County should offer a significant new opportunity for alternative travel.
T8	The 4-year target for the percent of Non-SOV travel established for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A)]	37.2
T9	Does the State DOT wish to adjust the 4-year target for the percent of Non-SOV travel? [23 CFR 490.105(e)(6)]	No
T9a	Please provide the adjusted 4-year target for the percent of Non-SOV travel. *Any adjustments made to 4-year targets established for this measure must be agreed upon and made collectively by all relevant State DOTs and MPOs. [23 CFR 490.105(e)(6)]* *The adjusted target should reflect expected performance by the end of Calendar Year 2021. This adjustment is only permitted in the Mid Performance Period Progress Report. [23 CFR 490.105(f)(8) and 23 CFR 490.107(b)(2)(ii)(E)]* *This adjusted target must be reported to the nearest tenth of a percent. For example, enter 86.5% as 86.5. [23 CFR 490.101 (Target definition) and 23 CFR 490.713(d)]*	
T9b	Please provide the basis for adjustment of the 4-year target for the percent of Non-SOV travel and describe how the adjusted target supports expectations documented in longer range plans, such as the State asset management plan and the long-range statewide transportation plan. [23 CFR 490.107(b)(2)(ii)(E)]	

Emissions

Emissions Reduction Performance Overview

Question No	Description	Field Type
E1	Please use this space to provide any general comments that may assist FHWA in its review of this part of the submission. You can use this space to provide greater context for your targets and current performance, provide additional background detail or clarification, note any assumptions, or discuss complications. This text may be shared verbatim online. (Optional)	Extensive coordination was conducted in the development of the 2-year and 4-year targets for the CMAQ On-Road Emissions Reduction Measure. VDOT participated in numerous calls and meetings with TPB staff and the other DOT constituents in the Washington, DC-MD-VA 8-hour ozone nonattainment area. Communication between the parties remained constant and transparent. Roles and expectations of all parties were established with letters of agreement on responsibilities for performance-based planning and programming. The VDOT CMAQ emissions reduction targets are reflective of the anticipated emission reductions from all CMAQ projects currently programmed in the Virginia portion of TPB's TIPs covering FY 18-21. Please note that baseline values for NOx and VOC emissions reductions were erroneously entered in the 2018 Baseline Performance Report. For NOx, 5.369 was erroneously entered, as that value represents the average kg/day from FY 14 thru 17, not the cumulative kg/day. The cumulative value is 5.369*4 = 21.476 kg/day. For VOC, 3.499 was erroneously entered, as that value represents the average kg/day from FY 14 thru 17, not the cumulative kg/day. The cumulative value would be 3.499*4 = 13.997 kg/day.
E2	Does the State include any areas designated as nonattainment or maintenance for PM2.5? *Note: Based on the response to E2, the State is not required to establish a statewide target for annual emissions reductions for PM2.5.*	No
E3	If the State includes any areas designated as nonattainment or maintenance for PM2.5, are NOx and/or VOC a significant contributor to PM2.5 emissions anywhere in the State? *A significant contributor is defined as a precursor pollutant that the State or EPA has made a finding that the precursor has a significant impact on particulate matter (PM) air quality problem in a given area; or, the State*	

	Implementation Plan establishes approved or adequate motor vehicle emissions budgets for that precursor. [40 CFR 93.102(b) and 40 CFR 93.119(f)]	
E4	Does the State include any areas designated as nonattainment or maintenance for PM10? *Note: Based on the response to E4, the State is not required to establish a statewide target for annual emissions reductions for PM10.*	No
E5	If the State includes any areas designated as nonattainment or maintenance for PM10, are NOx and/or VOC a significant contributor to PM10 emissions anywhere in the State?	
E6	Does the State include any areas designated as nonattainment or maintenance for CO? *Note: Based on the response to E6, the State is not required to establish a statewide target for annual emissions reductions for CO.*	No
E7	Does the State include any areas designated as nonattainment or maintenance for ozone? *Note: Based on the response to E7, the State is required to provide statewide targets for annual emissions reductions for NOx and VOC.*	Yes
E8	The number of MPOs within your State that are required to submit a CMAQ Performance Plan to the State DOT are:[23 CFR 490.107(b)(1)(ii)(G)]	1
E9.1	MPO required to submit a CMAQ Performance Plan to the State DOT:	National Capital Region Transportation Planning Board
E10.1	Did you upload the plan to the PMF on the “attachment” tab?	Yes
E10.1a	Please explain why the plan was not uploaded to the PMF.	

Statewide Total Emission Reductions PM2.5 Target #1

Question No	Description	Field Type
E11	The baseline emissions reductions (total daily kilograms) of PM2.5. *This value is from the 2018 Baseline Performance Period Report and is the performance derived from the latest data collected through the cumulative statewide estimated emissions reductions (total daily kilograms) for the previous 4 Federal Fiscal Years before the start of the performance period. [23 CFR 490.107(b)(1)(ii)(B)]* *This value is carried over from the 2018 Baseline Performance Period Report.*	
E12	Please provide the current estimated emissions	

	reductions (total daily kilograms) of PM2.5. [23 CFR 490.107(b)(2)(ii)(A) and 23 CFR 490.107(c)(3)(iii)(B)] *The current data for the performance period must include the cumulative reductions in emissions (total daily kilograms) over the Federal Fiscal Years 2018 and 2019.* *The data needed to calculate the measure shall come from the CMAQ Public Access System. [23 CFR 490.809(a) and 23 CFR 490(b)(2).* *The data must be reported to the nearest one thousandths. For example, enter 86.512. [23 CFR 490.101 (Target definition) and 23 CFR 490.811(b)]* *FHWA provided the prepopulated data from the CMAQ Public Access System. If the DOT feels that a different value is appropriate due to an error, please contact the FHWA Division Office in your State.*	
E13	The 2-year target for cumulative emissions reduction (total daily kilograms) of PM2.5 for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(c)(3)(ii)(B)]	
E14	Please provide a discussion of the progress made toward achieving the 2-year target for cumulative emissions reduction (total daily kilograms) of PM2.5. *At a minimum, this discussion should address overall progress as of the midpoint of the performance period, and shall include a comparison of the actual 2-year performance with the 2-year target and any reasons for differences in the actual and target values. [23 CFR 490.107(b)(2)(ii)(B)]*	
E15	The 4-year target for cumulative emissions reduction (total daily kilograms) of PM2.5 established for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(c)(3)(ii)(B)]	
E16	Does the State DOT wish to adjust the 4-year target for cumulative emissions reduction (total daily kilograms) of PM2.5? [23 CFR 490.105(e)(6)]	
E16a	Please provide the adjusted 4-year target for cumulative emissions reduction (total daily kilograms) of PM2.5. The adjusted target should reflect expected performance by the end of Federal Fiscal Year 2021. This adjustment is only permitted in the MPP Progress Report. [23 CFR 490.105(e)(6) and 23 CFR 490.107(b)(2)(ii)(E)] *This adjusted target must be reported to nearest one thousandths. For example, enter 86.512. [23 CFR 490.101 (Target definition) and 23 CFR 490.811(b)]*	
E16b	Please provide the basis for adjustments of the 4-year target for cumulative emissions reduction (total daily kilograms) of PM2.5 established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(2)(ii)(E) and 23	

	CFR 490.107(c)(3)(ii)(B)]	

Statewide Total Emission Reductions NOx Target #2

Question No	Description	Field Type
E17	The baseline emissions reductions (total daily kilograms) of NOx. *This value is from the 2018 Baseline Performance Period Report and is the performance derived from the latest data collected through the cumulative statewide estimated emissions reductions (total daily kilograms) for the previous 4 Federal Fiscal Years before the start of the performance period. [23 CFR 490.107(b)(1)(ii)(B)]*	5.369
E18	Please provide the current estimated emissions reductions (total daily kilograms) of NOx. [23 CFR 490.107(b)(2)(ii)(A) and 23 CFR 490.107(c)(3)(iii)(B)] *The current data for the performance period must include the cumulative reductions in emissions (total daily kilograms) over the Federal Fiscal Years 2018 and 2019.* *The data needed to calculate the measure shall come from the CMAQ Public Access System. [23 CFR 490.809(a) and 23 CFR 490(b)(2).* *The data must be reported to the nearest one thousandths. For example, enter 86.512. [23 CFR 490.101 (Target definition) and 23 CFR 490.811(b)]* *FHWA provided the prepopulated data from the CMAQ Public Access System. If the DOT feels that a different value is appropriate due to an error, please contact the FHWA Division Office in your State.*	9.068
E19	The 2-year target for cumulative emissions reduction (total daily kilograms) of NOx for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(c)(3)(ii)(B)]	3.744
E20	Please provide a discussion of the progress made toward achieving the 2-year target for cumulative emissions reduction (total daily kilograms) of NOx. At a minimum, this discussion should address overall progress as of the midpoint of the performance period, and shall include a comparison of the actual 2-year performance with the 2-year target and any reasons for differences in the actual and target values. [23 CFR 490.107(b)(2)(ii)(B)]	The implementation of performance target-setting for CMAQ projects has led to improvements in project emissions reductions quantification. In addition, the process has led to new priorities for use of CMAQ funds. As a result, the 2-year target was met and the 4-year target has already been met as well. Future efforts will likely continue to improve reported performance in emissions reductions of CMAQ funded projects in the metropolitan planning area.
E21	The 4-year target for cumulative emissions reduction (total daily kilograms) of NOx established for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR	4.230

	490.107(b)(1)(ii)(A) and 23 CFR 490.107(c)(3)(ii)(B)]	
E22	Does the State DOT wish to adjust the 4-year target for cumulative emissions reduction (total daily kilograms) of NOx? [23 CFR 490.105(e)(6)]	No
E22a	Please provide the adjusted 4-year target for cumulative emissions reduction (total daily kilograms) of NOx. *The adjusted target should reflect expected performance by the end of Federal Fiscal Year 2021. This adjustment is only permitted in the MPP Progress Report. [23 CFR 490.105(e)(6) and 23 CFR 490.107(b)(2)(ii)(E)]* *This adjusted target must be reported to nearest one thousandths. For example, enter 86.512. [23 CFR 490.101 (Target definition) and 23 CFR 490.811(b)]*	
E22b	Please provide the basis for adjustments of the 4-year target for cumulative emissions reduction (total daily kilograms) of NOx established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(2)(ii)(E) and 23 CFR 490.107(c)(3)(ii)(B)].	

Statewide Total Emission Reductions VOC Target #3

Question No	Description	Field Type
E23	The baseline emissions reductions (total daily kilograms) of VOC. *This value is from the 2018 Baseline Performance Period Report and is the performance derived from the latest data collected through the cumulative statewide estimated emissions reductions (total daily kilograms) for the previous 4 Federal Fiscal Years before the start of the performance period. [23 CFR 490.107(b)(1)(ii)(B)]*	3.499
E24	Please provide the current estimated emissions reductions (total daily kilograms) of VOC. [23 CFR 490.107(b)(2)(ii)(A) and 23 CFR 490.107(c)(3)(iii)(B)] *The current data for the performance period must include the cumulative reductions in emissions (total daily kilograms) over the Federal Fiscal Years 2018 and 2019.* *The data needed to calculate the measure shall come from the CMAQ Public Access System. [23 CFR 490.809(a) and 23 CFR 490(b)(2).* *The data must be reported to the nearest one thousandths. For example, enter 86.512. [23 CFR 490.101 (Target definition) and 23 CFR 490.811(b)]* *FHWA provided the prepopulated data from the CMAQ Public Access System. If the DOT feels that a different value is appropriate due to an error, please contact the FHWA Division Office in your State.*	4.491
E25	The 2-year target for cumulative emissions reduction (total daily kilograms) of VOC for the 2018-2021 Performance Period that was reported in the 2018	1.721

	Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(c)(3)(ii)(B)]	
E26	Please provide a discussion of the progress made toward achieving the 2-year target for cumulative emissions reduction (total daily kilograms) of VOC. *At a minimum, this discussion should address overall progress as of the midpoint of the performance period, and shall include a comparison of the actual 2-year performance with the 2-year target and any reasons for differences in the actual and target values. [23 CFR 490.107(b)(2)(ii)(B)]*	The implementation of performance target-setting for CMAQ projects has led to improvements in project emissions reductions quantification. In addition, the process has led to new priorities for use of CMAQ funds. As a result, the 2-year target was met and the 4-year target has already been met as well. Future efforts will likely continue to improve reported performance in emissions reductions of CMAQ funded projects in the metropolitan planning area.
E27	The 4-year target for cumulative emissions reduction (total daily kilograms) of VOC established for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(c)(3)(ii)(B)]	1.985
E28	Does the State DOT wish to adjust the 4-year target for cumulative emissions reduction (total daily kilograms) of VOC? [23 CFR 490.105(e)(6)]	No
E28a	Please provide the adjusted 4-year target for cumulative emissions reduction (total daily kilograms) of VOC. *The adjusted target should reflect expected performance by the end of Federal Fiscal Year 2021. This adjustment is only permitted in the MPP Progress Report. [23 CFR 490.105(e)(6) and 23 CFR 490.107(b)(2)(ii)(E)]* *This adjusted target must be reported to nearest one thousandths. For example, enter 86.512. [23 CFR 490.101 (Target definition) and 23 CFR 490.811(b)]*	
E28b	Please provide the basis for adjustments of the 4-year target for cumulative emissions reduction (total daily kilograms) of VOC established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(2)(ii)(E) and [23 CFR 490.107(c)(3)(ii)(B)].	

Statewide Total Emission Reductions PM10 Target #4

Question No	Description	Field Type
E29	The baseline emissions reductions (total daily kilograms) of PM10. *This value is from the 2018 Baseline Performance Period Report and is the performance derived from the latest data collected through the cumulative statewide estimated emissions reductions (total daily kilograms) for the previous 4 Federal Fiscal Years before the start of the performance period. [23 CFR 490.107(b)(1)(ii)(B)]*	

E30	Please provide the current estimated emissions reductions (total daily kilograms) of PM10. [23 CFR 490.107(b)(2)(ii)(A) and 23 CFR 490.107(c)(3)(iii)(B)] *The current data for the performance period must include the cumulative reductions in emissions (total daily kilograms) over the Federal Fiscal Years 2018 and 2019.* *The data needed to calculate the measure shall come from the CMAQ Public Access System. [23 CFR 490.809(a) and 23 CFR 490(b)(2).* *The data must be reported to the nearest one thousandths. For example, enter 86.512. [23 CFR 490.101 (Target definition) and 23 CFR 490.811(b)]* *FHWA provided the prepopulated data from the CMAQ Public Access System. If the DOT feels that a different value is appropriate due to an error, please contact the FHWA Division Office in your State.*	
E31	The 2-year target for cumulative emissions reduction (total daily kilograms) of PM10 for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(c)(3)(ii)(B)]	
E32	Please provide a discussion of the progress made toward achieving the 2-year target for cumulative emissions reduction (total daily kilograms) of PM10. *At a minimum, this discussion should address overall progress as of the midpoint of the performance period, and shall include a comparison of the actual 2-year performance with the 2-year target and any reasons for differences in the actual and target values. [23 CFR 490.107(b)(2)(ii)(B)]*	
E33	The 4-year target for cumulative emissions reduction (total daily kilograms) of PM10 established for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(c)(3)(ii)(B)]	
E34	Does the State DOT wish to adjust the 4-year target for cumulative emissions reduction (total daily kilograms) of PM10?[23 CFR 490.105(e)(6)]	
E34a	Please provide the adjusted 4-year target for cumulative emissions reduction (total daily kilograms) of PM10. *The adjusted target should reflect expected performance by the end of Federal Fiscal Year 2021. This adjustment is only permitted in the MPP Progress Report. [23 CFR 490.105(e)(6) and 23 CFR 490.107(b)(2)(ii)(E)]* *This adjusted target must be reported to nearest one thousandths. For example, enter 86.512. [23 CFR 490.101 (Target definition) and 23 CFR 490.811(b)]*	
E34b	Please provide the basis for adjustments of the 4-year target for cumulative emissions reduction (total daily	

	kilograms) of PM10 established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(2)(ii)(E) and 23 CFR 490.107(c)(3)(ii)(B)].	

Statewide Total Emission Reductions CO Target #5

Question No	Description	Field Type
E35	The baseline emissions reductions (total daily kilograms) of CO. *This value is from the 2018 Baseline Performance Period Report and is the performance derived from the latest data collected through the cumulative statewide estimated emissions reductions (total daily kilograms) for the previous 4 Federal Fiscal Years before the start of the performance period. [23 CFR 490.107(b)(1)(ii)(B)]*	
E36	Please provide the current estimated emissions reductions (total daily kilograms) of CO. [23 CFR 490.107(b)(2)(ii)(A) and 23 CFR 490.107(c)(3)(iii)(B)] *The current data for the performance period must include the cumulative reductions in emissions (total daily kilograms) over the Federal Fiscal Years 2018 and 2019.* *The data needed to calculate the measure shall come from the CMAQ Public Access System. [23 CFR 490.809(a) and 23 CFR 490(b)(2).* *The data must be reported to the nearest one thousandths. For example, enter 86.512. [23 CFR 490.101 (Target definition) and 23 CFR 490.811(b)]* *FHWA provided the prepopulated data from the CMAQ Public Access System. If the DOT feels that a different value is appropriate due to an error, please contact the FHWA Division Office in your State.*	
E37	The 2-year target for cumulative emissions reduction (total daily kilograms) of CO for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(c)(3)(ii)(B)]	
E38	Please provide a discussion of the progress made toward achieving the 2-year target for cumulative emissions reduction (total daily kilograms) of CO. *At a minimum, this discussion should address overall progress as of the midpoint of the performance period, and shall include a comparison of the actual 2-year performance with the 2-year target and any reasons for differences in the actual and target values. [23 CFR 490.107(b)(2)(ii)(B)]*	
E39	The 4-year target for cumulative emissions reduction (total daily kilograms) of CO established for the 2018-2021 Performance Period that was reported in the 2018 Baseline Performance Period Report. [23 CFR 490.107(b)(1)(ii)(A) and 23 CFR 490.107(c)(3)(ii)(B)]	

E40	Does the State DOT wish to adjust the 4-year target for cumulative emissions reduction (total daily kilograms) of CO? [23 CFR 490.105(e)(6)]	
E40a	Please provide the adjusted 4-year target for cumulative emissions reduction (total daily kilograms) of CO. *The adjusted target should reflect expected performance by the end of Federal Fiscal Year 2021. This adjustment is only permitted in the MPP Progress Report. [23 CFR 490.105(e)(6) and 23 CFR 490.107(b)(2)(ii)(E)]* *This adjusted target must be reported to nearest one thousandths. For example, enter 86.512. [23 CFR 490.101 (Target definition) and 23 CFR 490.811(b)]*	
E40b	Please provide the basis for adjustments of the 4-year target for cumulative emissions reduction (total daily kilograms) of CO established for the 2018-2021 Performance Period. [23 CFR 490.107(b)(2)(ii)(E) and 23 CFR 490.107(c)(3)(ii)(B)].	

Attachments

S.No	Section	Attachment Detail
1	Emissions	**Filename:** 2020_VA_Emissions_TPB CMAQ Performance Plan Final September 2020.pdf **Notes:** **Attachment Url:**
2	Freight	**Filename:** 2020_VA_Freight_Virginia's Freight Bottleneck Reporting for PMF 2020.pdf **Notes:** **Attachment Url:**
3	Freight	**Filename:** 2020_VA_Freight_Virginia Truck Freight Bottleneck Condition Analysis Results (2020).xlsx **Notes:** **Attachment Url:**
4	Freight	**Filename:** 2020_VA_Freight_VTrans2040 Virginia Freight Element (2017 State Freight Plan).pdf **Notes:** An update to Virginia's freight plan is underway. **Attachment Url:** https://www.vtrans.org/resources/VTrans2040-Freight-Element.pdf

APPENDIX F:
FREIGHT INVESTMENT PLAN

UPDATED ON JULY 13, 2022

Table 16: Fiscal Constraint - National Highway Freight Program

Fund Source	Prev		FFY 2018		FFY 2019		FFY 2020		FFY 2021		FFY 2022		TOTAL	
	Projected Obligation Authority	Planned Obligations	Projected Obligation Authority	Planned Obligations	Projected Obligation Authority	Planned Obligations	Projected Obligation Authority	Planned Obligations	Projected Obligation Authority	Planned Obligations	Projected Obligation Authority	Planned Obligations	Projected Obligation Authority	Planned Obligations
NHFP	$ 55,982,822	$ 45,051,330	28,371,723	$ 35,021,569	$ 33,029,930	$ 33,265,009	$ 36,697,637	$ 38,994,268	$ 37,317,857	$ 38,216,602	$ 56,552,954	$ 56,552,954	$ 247,952,923	$ 247,101,732

(1) FFY 2016 and 2017 included in Prev
(2) FFY 2018, 2019, 2020, and 2021 Planned Obligations include carry-over obligation authority from previous years
(3) FFY 2022 Projected Obligation Authority includes $21,967,387 in planned apportionment transfer

Table 17: National Highway Freight Program Project Listing

					Previous			FFY 2018			FFY 2019			FFY 2020			FFY 2021			FFY 2022		
					NHFP*	Other Federal Funds ^	State Match	NHFP*	Other Federal Funds ^	State Match	NHFP*	Other Federal Funds ^	State Match	NHFP*	Other Federal Funds ^	State Match	NHFP*	Other Federal Funds ^	State Match	NHFP*	Other Federal Funds ^	State Match
UPC	Project Description	Project Location	Phase	Total Cost																		
79923	#HB2.FY17 Rte 81 - Safety Improvements, Exit 213	From: Exit 213 Southbound Acceleration Lane To:Exit 213 Northbound Acceleration Lane	PE	$ 274,160	$ -	$ 219,407	$ 54,852	$ -	$ (79)	$ (20)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			CN	$ 2,083,878	$ 1,350,350	$ 203,378	$ -	$ 859,659	$ -	$ -	$ (329,509)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 2,358,038	$ 1,350,350	$ 422,785	$ 54,852	$ 859,659	$ (79)	$ (20)	$ (329,509)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
93074	#SGR RTE. 81 - Approaches and Bridges over Route 8	From: Christiansburg SCL To: Christiansburg	PE	$ 3,504,205	$ 1,070,137	$ 2,329,157	$ 104,911	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			RW	$ 38,537	$ -	$ -	$ -	$ -	$ 38,537	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			CN	$ 30,471,659	$ -	$ -	$ -	$ 4,019,140	$ 1,260,025	$ -	$ 674,158	$ 108,830	$ -	$ 11,088,884	$ -	$ -	$ 3,828,313	$ 2,432,719	$ -	$ 4,194,958	$ 984	$ -
		Total		$ 34,014,401	$ 1,070,137	$ 2,329,157	$ 104,911	$ 4,019,140	$ 1,298,562	$ -	$ 674,158	$ 108,830	$ -	$ 11,088,884	$ -	$ -	$ 3,828,313	$ 2,432,719	$ -	$ 4,194,958	$ 984	$ -
100702	#HB2.FY17 Modify I-95 SB Off Ramp at SR 784 Add Signal	From: 0.012 Miles West of Ashdale Dale Plaza To: 0.130 Mile East of Ashdale Dale Plaza	PE	$ 712,114	$ 153,408	$ 527,741	$ 30,965	$ (4,117)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			CN	$ 967,998	$ 983,449	$ 181,796	$ 23,512	$ -	$ -	$ -	$ (226,517)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 1,680,112	$ 1,136,857	$ 709,537	$ 54,594	$ (4,117)	$ -	$ -	$ (226,517)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
101595	#HB2.FY17 I-95 Rappahannock River Crossing (Southbound)	From: 1.29 Miles South of Rte 3 (Exit 130) To: 0.31 Miles North of Truslow Road	PE	$ 6,100,000	$ -	$ 4,444,960	$ 149,042	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 857,004	$ -	$ -	$ 648,994	$ -	$ -	$ -	$ -
			RW	$ 700,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 700,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			CN	$ 109,329,998	$ -	$ -	$ -	$ 11,010,668	$ 16,007,713	$ -	$ 22,018,554	$ -	$ -	$ -	$ -	$ -	$ -	$ 13,565,595	$ -	$ -	$ -	$ -
		Total		$ 116,129,998	$ -	$ 4,444,960	$ 149,042	$ 11,010,668	$ 16,007,713	$ -	$ 22,718,554	$ -	$ -	$ -	$ 857,004	$ -	$ -	$ 14,214,590	$ -	$ -	$ -	$ -
103320	#HB2.FY17 Add merging lane on I-77N in Ft. Chiswell	From: SB I-81 Entrance Ramp 0.130 mi. N. Rte. 121 To: SB I-81 Entrance Ramp 1.295 mi. N. Rte. 121	PE	$ 691,769	$ 748,882	$ 51,118	$ -	$ -	$ -	$ -	$ (188,005)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			CN	$ 5,525,253	$ 2,451,118	$ -	$ -	$ 3,592,769	$ -	$ -	$ 105,733	$ -	$ -	$ -	$ -	$ -	$ (676,563)	$ -	$ -	$ -	$ -	$ -
		Total		$ 6,217,022	$ 3,200,000	$ 51,118	$ -	$ 3,592,769	$ -	$ -	$ (82,272)	$ -	$ -	$ -	$ -	$ -	$ (676,563)	$ -	$ -	$ -	$ -	$ -
104329	I-64 & I-264 Pavement Rehabilitation - DB Project #1	From: 1240 ft east of the east Abutment of Claiborne Ave To: west Abutment of the Broad Creek Bridge	CN	$ 34,247,559	$ 10,000,000	$ 19,982,873	$ 1,970,437	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 34,247,559	$ 10,000,000	$ 19,982,873	$ 1,970,437	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
104936	#SGR I-81 Structures 19306 & 19597 over Reed Creek in Wythe	From: 1.11 to I-77 To: 1.11 to Route 619	PE	$ 1,080,091	$ 1,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 80,046	$ -	$ -	$ -	$ -	$ -
			CN	$ 20,899,197	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,595,266	$ -	$ -	$ 10,344,548	$ 734,429	$ -	$ 6,697,084	$ -	$ -	$ 517,870	$ -	$ -
		Total		$ 21,969,288	$ 1,000,000	$ -	$ -	$ -	$ -	$ -	$ 2,595,266	$ -	$ -	$ 10,424,594	$ 734,429	$ -	$ 6,697,084	$ -	$ -	$ 517,870	$ -	$ -
106726	#SGR F18 SGR Plant Mix Interstate PM2R-017-F18	From: 0.05 MI North MM 18 To: 0.02 MI North MM 19	PE	$ 1,159,067	$ 1,298,728	$ -	$ -	$ -	$ -	$ -	$ (139,661)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 1,159,067	$ 1,298,728	$ -	$ -	$ -	$ -	$ -	$ (139,661)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
106737	#SGR FY17 SGR I-81 NB Bote. Co. Concrete Undersealing	From: MM 149.5 / S. End Railroad Overpass To: South End of Rte. 779 Overpass	CN	$ 3,565,427	$ 4,322,917	$ -	$ -	$ -	$ -	$ -	$ (758,088)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 3,565,427	$ 4,322,917	$ -	$ -	$ -	$ -	$ -	$ (758,088)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
107044	#HB2.FY17 I64/Northampton Boulevard Interchange Modification	From: I-64 WB Off-Ramp To: Route 13 - Northampton Blvd	PE	$ 998,458	$ 1,298,330	$ -	$ -	$ -	$ -	$ -	$ (302,777)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			CN	$ 5,590,851	$ 4,000,000	$ -	$ -	$ 1,543,745	$ -	$ -	$ 30,768	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 6,589,309	$ 5,298,330	$ -	$ -	$ 1,543,745	$ -	$ -	$ (271,991)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
107117	#SGR I-81 STRUCTURES 17470 & 17472 OVER RTE. 686	From. 0.168 Mi. Northeast of Rte. 622 (Nicks Creek Rd.) To: 0.341 Mi. Southeast of Rte. 615 (Kiawana Rd.)	CN	$ 15,264,757	$ -	$ -	$ -	$ 5,883,787	$ -	$ -	$ 428,014	$ 1,203,499	$ -	$ 7,112,714	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 15,264,757	$ -	$ -	$ -	$ 5,883,787	$ -	$ -	$ 428,014	$ 1,203,499	$ -	$ 7,112,714	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
107459	#HB2.FY17 Rte 64 - Extend Acceleration/Deceleration Lanes	From: At Weigh Stations To:	PE	$ 103,839	$ -	$ 360,000	$ 90,000	$ -	$ -	$ -	$ -	$ (277,126)	$ (69,281)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			CN	$ 3,942,349	$ 1,243,004	$ -	$ -	$ 2,485,508	$ -	$ -	$ (121,221)	$ -	$ -	$ -	$ 258,927	$ 64,732	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 4,046,188	$ 1,243,004	$ 360,000	$ 90,000	$ 2,485,508	$ -	$ -	$ (121,221)	$ (277,126)	$ (69,281)	$ -	$ 258,927	$ 64,732	$ -	$ -	$ -	$ -	$ -	$ -
107461	#HB2.FY17 Rte 64 EB - Pavement Marking	From: At Rte 295 To:	PE	$ 13,070	$ 40,000	$ 10,000	$ -	$ -	$ -	$ -	$ -	$ (29,546)	$ (7,386)	$ -	$ -	$ -	$ -	$ (4,200)	$ -	$ -	$ -	$ -
			CN	$ 1,452,444	$ -	$ -	$ -	$ 1,445,800	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 1,465,514	$ 40,000	$ 10,000	$ -	$ 1,445,800	$ -	$ -	$ -	$ (29,546)	$ (7,386)	$ -	$ -	$ -	$ -	$ (4,200)	$ -	$ -	$ -	$ -
107748	Edinburg Res. Interstate Plant Mix(PM-8U-16)	From: MM 30.0 To: Roanoke - MM32.0	CN	$ 1,956,739	$ 1,000	$ 376,332	$ -	$ 4,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 1,956,739	$ 1,000	$ 376,332	$ -	$ 4,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
107795	#HB2.FY17 Rte 95 - Improve Ramp Area at Franklin St	From: 0.008 MI N of Intersection Main/15th Street To: 0.04 MI N of Intersection of 15th/Franklin Street	PE	$ 626,347	$ -	$ 650,000	$ -	$ -	$ -	$ -	$ -	$ (23,653)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			RW	$ 45,366	$ -	$ 35,895	$ -	$ -	$ -	$ -	$ 9,105	$ -	$ -	$ -	$ 366	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			CN	$ 2,141,811	$ -	$ -	$ -	$ 1,051,202	$ -	$ -	$ 547,764	$ 210,393	$ -	$ -	$ 14,634	$ -	$ 317,818	$ -	$ -	$ -	$ -	$ -
		Total		$ 2,813,524	$ -	$ 685,895	$ -	$ 1,051,202	$ -	$ -	$ 556,869	$ 186,740	$ -	$ -	$ 15,000	$ -	$ 317,818	$ -	$ -	$ -	$ -	$ -
107796	#HB2.FY17 Rte 95 - Extend NB Decel Lane at Hermitage Rd	From: 0.362 Miles East of Hermitage Road To: 0.031 Miles East of Hermitage Road	PE	$ 777,697	$ 4,000	$ 550,000	$ -	$ 66,000	$ -	$ -	$ 100,000	$ 57,800	$ -	$ -	$ -	$ -	$ (103)	$ -	$ -	$ -	$ -	$ -
			RW	$ 57,260	$ 40,000	$ -	$ -	$ -	$ -	$ -	$ (3,020)	$ -	$ -	$ -	$ 103	$ -	$ 10,604	$ -	$ -	$ -	$ -	$ -
			CN	$ 1,857,452	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,905,225	$ -	$ -	$ -	$ -	$ -	$ (48,097)	$ -	$ -	$ -	$ -	$ -
		Total		$ 2,692,409	$ 44,000	$ 550,000	$ -	$ 66,000	$ -	$ -	$ 2,002,199	$ 57,800	$ -	$ -	$ -	$ -	$ (37,493)	$ -	$ -	$ -	$ -	$ -
107797	#HB2.FY17 Rte 95 - Extend NB Accel Lane at Belvidere St	From: 0.017 MI S Rte 301 To: 0.300 MI N Rte 301	PE	$ 854,143	$ -	$ 850,000	$ -	$ -	$ (189,000)	$ -	$ -	$ -	$ -	$ -	$ 139,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			RW	$ 205,490	$ -	$ -	$ -	$ 48,155	$ 167,738	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (21,245)	$ -
			CN	$ 2,361,267	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,564,190	$ 50,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 3,420,900	$ -	$ 850,000	$ -	$ 48,155	$ (21,262)	$ -	$ -	$ -	$ -	$ 1,564,190	$ 189,000	$ -	$ -	$ -	$ -	$ -	$ (21,245)	$ -
108007	I-95 Greensville County joint closure and overlay	From: MP 0.80 To: MP 17.10	CN	$ 5,135,157	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,134,100	$ -	$ -
		Total		$ 5,135,157	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,134,100	$ -	$ -
108257	I66 - Joint Closure and Beam Repair - var structures	From: VARIOUS To: LOCATIONS	CN	$ 2,752,952	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,752,800	$ -	$ -
		Total		$ 2,752,952	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,752,800	$ -	$ -
108316	INTERSTATE BRIDGE PAINTING OVER JAMES RIVER AND CSXRR	From: 2.45 MI. INT.RTE. 11 To: 2.30 MI. INT. RTE 11	CN	$ 1,521,529	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,519,400	$ -	$ -
		Total		$ 1,521,529	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,519,400	$ -	$ -
108423	#RBT Over Height Detection	From: JCT I-564 To: Hampton Roads Bridge Tunnel	CN	$ 900,000	$ 900,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 900,000	$ 900,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
108573	#HB2.FY17 Commuter Lot Expansion I-95 E of Exit 140	From: Commuter Lot Expansion E of Exit 140 To: I-95 East of Exit 140	PE	$ 31,250	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 31,250	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			RW	$ 300,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 300,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			CN	$ 9,387,993	$ 3,625,000	$ -	$ -	$ -	$ -	$ -	$ 1,510,381	$ 3,375,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 9,719,243	$ 3,625,000	$ -	$ -	$ -	$ -	$ -	$ 1,510,381	$ 3,706,250	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
108809	#HB2.FY17 I-81 Exit 245 NB Off Ramp Realignment	From: I-81 NB Exit Off Ramp Gore To: Intersection of Rte. 253	PE	$ 498,020	$ 457,485	$ 98,904	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (58,369)	$ -	$ -	$ -	$ -
			RW	$ 75,000	$ -	$ -	$ -	$ 155,725	$ -	$ -	$ -	$ -	$ -	$ (80,725)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			CN	$ 3,150,701	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 334,547	$ -	$ 1,217,361	$ 594,715	$ -	$ -	$ 1,004,078	$ -	$ -	$ -	$ -
		Total		$ 3,723,720	$ 457,485	$ 98,904	$ -	$ 155,725	$ -	$ -	$ -	$ 334,547	$ -	$ 1,136,636	$ 594,715	$ -	$ -	$ 945,718	$ -	$ -	$ -	$ -
109130	I64 - MAINTENANCE - STR. 2043, 2044 & 2062	From: STR. 2043, 2044 & 2067 To: STR. 2043, 2044 & 2067	PE	$ 38,428	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 38,300	$ -	$ -
			CN	$ 2,739,903	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,739,500	$ -	$ -
		Total		$ 2,778,331	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,777,800	$ -	$ -
109198	#SGR Staunton Dist. State of Good Repair Paving Project (PM-8)	From: 181.09 To: 184.21	CN	$ 2,431,978	$ 2,421,895	$ -	$ -	$ 10,083	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 2,431,978	$ 2,421,895	$ -	$ -	$ 10,083	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
109257	#SGR FY17/FY18 SGR INTERSTATE	From: VARIOUS To: VARIOUS	CN	$ 527,946	$ 563,550	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (35,604)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 527,946	$ 563,550	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (35,604)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
109310	#HB2.FY17 SHOCKOE VALLEY ST IMPROVEMENT	From: Various To: Various	PE	$ 2,995,587	$ 1,000,000	$ 1,584,530	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 711,470	$ -	$ -	$ 40,000	$ -	$ -
			RW	$ 6,213,908	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			CN	$ 25,676,231	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 34,885,726	$ 1,000,000	$ 1,584,530	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 711,470	$ -	$ -	$ 40,000	$ -	$ -
109320	#HB2.FY17 SB I95 Belvidere St Interchange Safety Improvement	From: 0.079 MILES WEST OF RTE. 1 To: 0.202 MILES EAST OF RTE. 1	PE	$ 1,112,221	$ -	$ -	$ -	$ -	$ 100,000	$ -	$ -	$ 650,000	$ -	$ -	$ -	$ -	$ -	$ 300,000	$ -	$ -	$ -	$ -
			RW	$ 507,201	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 408,487	$ -	$ -	$ 98,714	$ -	$ -	$ -	$ -
			CN	$ 9,426,860	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 259,572	$ 7,447,932	$ -
		Total		$ 11,045,291	$ -	$ -	$ -	$ -	$ 100,000	$ -	$ -	$ 650,000	$ -	$ -	$ 408,487	$ -	$ -	$ 398,714	$ -	$ 259,572	$ 7,447,932	$ -
109321	#HB2.FY17 Rte 95 - Improve Interchange at Maury St	From: Rte 95 SB Mainline To: Maury St	PE	$ 1,045,000	$ 1,087,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (42,500)	$ -	$ -
			RW	$ 1,882,795	$ -	$ -	$ -	$ -	$ 1,081,250	$ -	$ -	$ -	$ -	$ 315,237	$ 486,308	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			CN	$ 4,977,334	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,377,719	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 7,905,129	$ 1,087,500	$ -	$ -	$ -	$ 1,081,250	$ -	$ -	$ -	$ -	$ 315,237	$ 4,864,027	$ -	$ -	$ -	$ -	$ (42,500)	$ -	$ -
109322	#HB2.FY17 Rte95 - Improve Interchange at Rte 10	From: Rte 10 E Off Ramp To: Rte 10 W On Ramp	PE	$ 1,448,653	$ 1,500,000	$ -	$ -	$ 100,000	$ -	$ -	$ -	$ -	$ -	$ 76,871	$ -	$ -	$ -	$ -	$ -	$ (228,218)	$ -	$ -
			RW	$ 611,612	$ -	$ -	$ -	$ -	$ -	$ -	$ 530,000	$ -	$ -	$ -	$ 23,641	$ -	$ 57,971	$ -	$ -	$ -	$ -	$ -
			CN	$ 9,366,017	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,142,620	$ 3,636,359	$ -	$ 577,802	$ -	$ -	$ 228,218	$ -	$ 358,908
		Total		$ 11,426,282	$ 1,500,000	$ -	$ -	$ 100,000	$ -	$ -	$ 530,000	$ -	$ -	$ 2,219,491	$ 3,660,000	$ -	$ 635,773	$ -	$ -	$ -	$ -	$ 358,908
109368	#HB2.FY 17 I-81 Exit 222 NB Accel and SB Decel Lane Extension	From: NB Accel Ramp Exit 222 To: SB Decel Ramp Exit 222	PE	$ 218,967	$ 331,008	$ -	$ -	$ -	$ -	$ -	$ -	$ (112,680)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			CN	$ 820,548	$ -	$ -	$ -	$ 129,941	$ 552,229	$ -	$ 73,298	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 1,039,515	$ 331,008	$ -	$ -	$ 129,941	$ 552,229	$ -	$ 73,298	$ (112,680)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
109377	#HB2. FY 17 I-81 Exit 220 and Exit 221 Decel/Accel Extensions	From: Exit 220 NB Decel Lane To: Exit 221 SB Accel Lane	PE	$ 479,877	$ 575,926	$ -	$ -	$ -	$ -	$ -	$ (176,269)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			CN	$ 3,051,725	$ -	$ -	$ -	$ 96,721	$ 2,720,737	$ -	$ 493,679	$ -	$ -	$ -	$ -	$ -	$ (259,572)	$ -	$ -	$ -	$ -	$ -
		Total		$ 3,531,602	$ 575,926	$ -	$ -	$ 96,721	$ 2,720,737	$ -	$ 317,410	$ -	$ -	$ -	$ -	$ -	$ (259,572)	$ -	$ -	$ -	$ -	$ -
109419	#HB2.FY17 I-81 at State Route 75 (Exit 17) Interchange Mod.	From: 0.371 mi. S. Rte. 75 Int. To: 0.220 mi. N. Rte. 75 Int.	PE	$ 2,225,108	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 887,139	$ -
			RW	$ 16,897,260	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 488,941	$ 1,166,796	$ -	$ -	$ 4,433,759	$ -	$ -	$ 1,323,834	$ -
			CN	$ 13,610,151	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,497,487	$ -
		Total		$ 32,722,517	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 488,941	$ 1,166,796	$ -	$ -	$ 4,433,759	$ -	$ -	$ 3,708,460	$ -
109440	#HB2.FY17 I-81 Exit 19 Ramp Improvements	From: 0.20 MI. West Intersection Rte. 11 To: 0.20 MI. East Intersection Rte. 11	PE	$ 852,814	$ 830,443	$ -	$ -	$ -	$ -	$ -	$ (66,170)	$ -	$ -	$ 98,330	$ -	$ -	$ -	$ -	$ -	$ (9,789)	$ -	$ -
			RW	$ 907,060	$ -	$ -	$ -	$ -	$ -	$ -	$ 331,119	$ -	$ -	$ 566,000	$ -	$ -	$ 9,433	$ -	$ -	$ -	$ -	$ -
			CN	$ 4,666,389	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,077,687	$ 2,294,390	$ -	$ 779,523	$ -	$ -	$ (466,154)	$ 81,947	$ -
		Total		$ 6,426,263	$ 830,443	$ -	$ -	$ -	$ -	$ -	$ 264,949	$ -	$ -	$ 1,742,017	$ 2,294,390	$ -	$ 788,956	$ -	$ -	$ (475,943)	$ 548,579	$ -
110561	I-95 Ramp Metering Expansion - PE Only	From: Various locations From MM 170 To: Various locations From MM 133	PE	$ 89,529	$ 200,000	$ -	$ -	$ -	$ -	$ -	$ (110,471)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 89,529	$ 200,000	$ -	$ -	$ -	$ -	$ -	$ (110,471)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
110578	Route 81 Wash.Co. Va. Str.# 2012&2011 Fed.Str.# 18924&18922	From: 2.52 mi from Rte. 75 To: 6.76 mi to rte. 737	CN	$ 3,192,474	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,146,000	$ -	$ -
		Total		$ 3,192,474	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,146,000	$ -	$ -
110595	#SGR RTE 95 SB&NB OVER RTE 17 BRIDGE REPLACE ID 18083/18085	From: Exit 133 To:Exit 133	CN	$ 13,333,628	$ -	$ -	$ -	$ -	$ 2,215,640	$ -	$ 1,060,746	$ -	$ -	$ -	$ 1,733,896	$ -	$ -	$ 3,666,499	$ -	$ -	$ -	$ -
		Total		$ 13,333,628	$ -	$ -	$ -	$ -	$ 2,215,640	$ -	$ 1,060,746	$ -	$ -	$ -	$ 1,733,896	$ -	$ -	$ 3,666,499	$ -	$ -	$ -	$ -
110884	#SGR FY18 I-81 SB Roanoke County	From: 0.75 Mi. South S. End Rte.1836 Bridge To: Roanoke - Botetourt County Line	CN	$ 1,829,943	$ -	$ -	$ -	$ 1,355,401	$ 418,868	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 1,829,943	$ -	$ -	$ -	$ 1,355,401	$ 418,868	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
111054	#SMART18 - (St) I-81 Exit 300 Southbound Accel Lane Ext.	From: MP 299.6 To: MP 300.66	PE	$ 915,000	$ 287,750	$ -	$ -	$ 190,382	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 251,868	$ -	$ -	$ 185,000	$ -	$ -
			CN	$ 8,480,200	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,355,410	$ -	$ -
		Total		$ 9,395,200	$ 287,750	$ -	$ -	$ 190,382	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 251,868	$ -	$ -	$ 4,540,410	$ -	$ -
111056	#SMART18 - (St) I-81 Exit 315 Northbound Decel Lane Ext	From: Extend Northbound To: Decel Lane	PE	$ 41,251	$ 80,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (38,749)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			CN	$ 281,976	$ -	$ -	$ -	$ -	$ -	$ -	$ 401,001	$ -	$ -	$ -	$ -	$ -	$ (119,025)	$ -	$ -	$ -	$ -	$ -
		Total		$ 323,227	$ 80,000	$ -	$ -	$ -	$ -	$ -	$ 401,001	$ -	$ -	$ (38,749)	$ -	$ -	$ (119,025)	$ -	$ -	$ -	$ -	$ -
111059	#SMART18 - (St) I-81 Exit 296 Accel/Decal Lane Extensions	From: NB Accal Lane Extension To: SB Decal Lane Extension	PE	$ 69,599	$ 100,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (30,401)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			CN	$ 486,524	$ -	$ -	$ -	$ -

					Previous			FFY 2018			FFY 2019			FFY 2020			FFY 2021			FFY 2022		
					NHFP*	Other Federal Funds ^	State Match	NHFP*	Other Federal Funds ^	State Match	NHFP*	Other Federal Funds ^	State Match	NHFP*	Other Federal Funds ^	State Match	NHFP*	Other Federal Funds ^	State Match	NHFP*	Other Federal Funds ^	State Match
UPC	Project Description	Project Location	Phase	Total Cost																		
111071	PM-42-18 RTE 85 ASPHALT RESURFACING - INTERSTATE SYSTEM	From: Various To: Various	CN	$ 3,958,521	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 349,000	$ 3,607,500	$ -
		Total		$ 3,958,521	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 349,000	$ 3,607,500	$ -
111172	F18 Districtwide Interstate Latex Schedule LM2A-962-F18	From: Various To: Various	CN	$ 1,238,660	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 880,000	$ 358,660	$ -	$ -	$ -	$ -
		Total		$ 1,238,660	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 880,000	$ 358,660	$ -	$ -	$ -	$ -
111191	F18 Plant Mix Interstate PM2S-962-F18	From: Various To: Various	CN	$ 9,128,250	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,120,000	$ -	$ -	$ -	$ -	$ -
		Total		$ 9,128,250	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,120,000	$ -	$ -	$ -	$ -	$ -
111265	#SGR - I-81 NBL Smyth Co VA #2034 Federal Structure #17478	FROM: I-81 Corridor TO: I-81 Corridor	CN	$ 16,239,695	$ -	$ -	$ -	$ 977,000	$ 333,464	$ -	$ 322,775	$ -	$ -	$ -	$ -	$ -	$ 4,709,387	$ 5,810,012	$ -	$ -	$ -	$ -
		Total		$ 16,239,695	$ -	$ -	$ -	$ 977,000	$ 333,464	$ -	$ 322,775	$ -	$ -	$ -	$ -	$ -	$ 4,709,387	$ 5,810,012	$ -	$ -	$ -	$ -
111294	#SGR - BRIDGE REHAB I-64/5TH ST OVER I-95	From: I-64 RAMP 190A OVER I-95 To: I-64 RAMP 190A OVER I-95	PE	$ 400,000	$ -	$ 311,769	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 48,231	$ -	$ -	$ 40,000	$ -	$ -	$ -	$ -
			RW	$ 53,612	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 53,612	$ -	$ -	$ -	$ -
			CN	$ 8,175,775	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,463,471	$ 3,166,731	$ -	$ -	$ -	$ -
		Total		$ 8,629,387	$ -	$ 311,769	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 48,231	$ -	$ 1,463,471	$ 3,260,343	$ -	$ -	$ -	$ -
111302	#SGR18VB - BRIDGE REHAB I-95 OVER RT 608 (REYMET RD) CN ONLY	From: 0.2807 MI. S RTE 608 To:0.2805 MI. N RTE 608	CN	$ 9,408,731	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,856,470	$ 928,709	$ -	$ -	$ -	$ -
		Total		$ 9,408,731	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,856,470	$ 928,709	$ -	$ -	$ -	$ -
111303	#SGR - BRIDGE-ONLY REHAB I-64 OVER I-95 (FED. ID 21441)	From: I-64W/LAB. AVE RAMP OVER I-95 To: I-64W/LAB. AVE RAMP OVER I-95	PE	$ 450,000	$ -	$ 250,000	$ -	$ -	$ -	$ -	$ -	$ 300,000	$ -	$ -	$ -	$ -	$ -	$ (100,000)	$ -	$ -	$ -	$ -
			CN	$ 4,200,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 550,000	$ -	$ -	$ -	$ -
		Total		$ 4,650,000	$ -	$ 250,000	$ -	$ -	$ -	$ -	$ -	$ 300,000	$ -	$ -	$ -	$ -	$ -	$ 450,000	$ -	$ -	$ -	$ -
111359	#SMART18 - I-81 SB Safety Improvements MM167.4 to MM169.5	From: MM167.4 To: MM 169.5	PE	$ 580,981	$ -	$ -	$ -	$ -	$ 6,473	$ 1,618	$ -	$ -	$ -	$ -	$ -	$ -	$ 570,397	$ -	$ -	$ -	$ -	$ -
			CN	$ 4,542,411	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 967,168	$ 128,701	$ -	$ -	$ 3,446,542	$ -
		Total		$ 5,123,392	$ -	$ -	$ -	$ -	$ 6,473	$ 1,618	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,537,565	$ 128,701	$ -	$ -	$ 3,446,542	$ -
111373	#SMART18 - I-81 SB Auxiliary Lane From Exit 143 to 141	From: Exit 143 SB To: Exit 141 SB	CN	$ 13,829,085	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,652,450	$ -	$ -	$ -	$ -	$ -	$ 560,757	$ 208,114	$ -
		Total		$ 13,829,085	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,652,450	$ -	$ -	$ -	$ -	$ -	$ 560,757	$ 208,114	$ -
111465	#SMART18 - I-95/I-64 Overlap: Emergency Pull-Offs	From: I-64 W To: I-64 E	PE	$ 517,423	$ 1,085,450	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (568,227)	$ -	$ -	$ -	$ -	$ -
			RW	$ 523,773	$ -	$ -	$ -	$ -	$ -	$ -	$ 164,550	$ -	$ -	$ -	$ -	$ -	$ 883,291	$ -	$ -	$ -	$ -	$ -
			CN	$ 1,218,337	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,208,230	$ -	$ -	$ 6,777	$ -	$ -
		Total		$ 2,259,533	$ 1,085,450	$ -	$ -	$ -	$ -	$ -	$ 164,550	$ -	$ -	$ -	$ -	$ -	$ 1,523,294	$ -	$ -	$ 6,777	$ -	$ -
111466	#SMART18 - I-95 Aux Lanes (nb & sb) b/w Rte. 288 & Rte. 10	From: Route 288 To: Route 10	PE	$ 2,160,000	$ -	$ 184,911	$ -	$ -	$ -	$ -	$ -	$ 1,590	$ -	$ -	$ 112,518	$ -	$ 1,883,326		$ -	$ -	$ 211,224	$ -
			RW	$ 1,249,769	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,249,769	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			CN	$ 25,340,231	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 28,770,000	$ -	$ 184,911	$ -	$ -	$ -	$ -	$ -	$ 1,590	$ -	$ 1,249,769	$ 112,518	$ -	$ 1,883,326	$ -	$ -	$ -	$ 211,224	$ -
112417	#SGR F19 Plant Mix Interstate PM2N-060-F18	From: RAMP TO COLLECTOR/DISTRIBUTOR RD. To: 0.51 MI. S. S. END RTE. 641 BR./0.08 MI. S. MM 120.3	CN	$ 1,599,842	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,212,569	$ 162,933	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 1,599,842	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,212,569	$ 162,933	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
112855	#SGR F19/C19 PM1J Bland Interstate	From: Various To: Various	CN	$ 1,930,538	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 1,930,538	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
113386	#SGR - BRIDGE DECK REPLACMENT SB I-95 OVER RTE 301 & EB 460	From: MM 51.09 To: MM 51.16	PE	$ 500,000	$ -	$ 500,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 69,565	$ 100,000	$ -	$ -	$ -	$ -	$ (69,565)	$ (100,000)	$ -
			CN	$ 4,576,557	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 107,686	$ 3,555,122	$ -	$ 123,139	$ 719,599	$ -
		Total		$ 5,076,557	$ -	$ 500,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 69,565	$ 100,000	$ -	$ 107,686	$ 3,555,122	$ -	$ 123,574	$ 619,599	$ -
113505	RTE.66 LATEX OVERLAY STRS 2000 AND 2001	From: STR.2000 WB To: STR.2001 EB	PE	$ 35,502	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 35,400	$ -	$ -
			CN	$ 797,769	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 797,600	$ -	$ -
		Total		$ 833,271	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 833,000	$ -	$ -
113638	I-95 OVER 15TH ST AND JAMES RIVER - TROUGH REHAB	From: 1.61 MI S RTE 195 To: 0.82 MI S RTE 195	PE	$ 45,029	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 44,900	$ -	$ -
			CN	$ 888,454	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 888,300	$ -	$ -
		Total		$ 933,483	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 933,200	$ -	$ -
113639	I-85 - MILL, HYDRO DEMO & OVERLAY BRIDGES	From: Various Locations To: Various Locations	CN	$ 2,184,765	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,184,200	$ -	$ -
		Total		$ 2,184,765	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,184,200	$ -	$ -
114301	RTE. 81 OVER RTE. 220 ALTERNATE - DECK OVERLAY	From: 3.07 MI. TO ROANOKE CO. To: 3.32 MI. TO ROANOKE CO.	PE	$ 40,701	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 40,600	$ -	$ -
			CN	$ 1,794,758	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,794,600	$ -	$ -
		Total		$ 1,835,459	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,835,200	$ -	$ -
115010	#SGR20VB - I-64 HRBT Expansion Project - Design-Build Contract	From: Settlers Landing Road To: I-564	CN	$ 200,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 18,440,195	$ 101,318,533	$ -
		Total		$ 200,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 18,440,195	$ 101,318,533	$ -
115011	#SGR20VB - I-64 HRBT Expansion Project - South Trestles	From: Willoughby Spit Shoreline To: HRBT South Island Shoreline	PE	$ 3,527,946	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			CN	$ 104,999,700	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 984	$ 11,440,510	$ -	$ 3,172,921	$ -	$ -
		Total		$ 108,527,646	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 984	$ 11,440,510	$ -	$ 3,172,921	$ -	$ -
116008	I66 PARAPET REPLACEMENT STR. 2030 & 2031	From: At Str. 2030 To: At Str. 2031	PE	$ 12,849	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,700	$ -	$ -
			CN	$ 951,420	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 951,300	$ -	$ -
		Total		$ 964,269	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 964,000	$ -	$ -
117110	#SGR21VB (FED ID 3017) Brid Repl/I77 over Rte. 606	From: 0.57 MI S of Secondary Route 606 To: 0.37 MI N of Secondary Route 606	PE	$ 1,786,365	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 885,663	$ 900,702	$ -
			RW	$ 162,639	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
			CN	$ 13,982,696	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total		$ 15,931,700	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 885,663	$ 900,702	$ -
118638	#TTF22 VSL - Data Programming Algorithm	From: 115 To: 130	PE	$ 1,900,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,900,000	$ -	$ -
		Total		$ 1,900,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,900,000	$ -	$ -
		Grand Total		$ 871,738,351	$ 45,051,330	$ 33,712,771	$ 2,427,836	$ 35,021,569	$ 24,713,595	$ 1,598	$ 33,265,009	$ 6,292,839	$ (76,667)	$ 38,994,268	$ 17,037,420	$ 64,732	$ 38,216,602	$ 52,024,056	$ -	$ 56,552,954	$ 122,355,832	$ -

Notes:

* All National Highway Freight Program (NHFP) funds include matching funds provided by the use of Toll Credits as Soft Match.

^ Other Federal Funds may include matching funds provided by the use of Toll Credits as Soft Match.

No change (Qty - 43)

Updates reflect planned obligations based on current project estimates, available Six-Year Improvement Program allocations and actual obligations (Qty - 8)

New (Qty -13)

SUBMITTED BY THE VIRGINIA OFFICE OF INTERMODAL PLANNING AND INVESTMENT (OIPI)
SUBMITTED PURSUANT TO 23 U.S.C. § 135, 23 CFR § 450.216, 23 CFR § 450.206 AND 49 U.S.C. § 70202 (STATE FREIGHT PLANS)