



COMMONWEALTH of VIRGINIA
Office of the
SECRETARY of TRANSPORTATION

VTrans Update: Vulnerability Assessment (Flooding and Sea Level Rise) Mid-Term Needs

Commonwealth Transportation Board Workshop

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June 18, 2019



Virginia Department of Rail and Public Transportation



PURPOSE

- Provide an update and seek feedback on activities conducted and completed since October 2018
 - Trends Analysis – Vulnerability Assessment
 - VTrans Vision and Goals
 - Mid-Term Needs Assessment
 - Outreach and Engagement
 - Schedule & Next Steps



PLANNING HORIZONS

Mid-Term Needs	Long-Term Needs
7 - 10 year time horizon	10 + year time horizon
Used as screening criteria for SMART SCALE	Used to inform policy, planning and project recommendations to prepare for 10+ years out
Action requested by December 2019	Expect to request action in 2020 or 2021



TRENDS ANALYSIS:

VTRANS VULNERABILITY ASSESSMENT

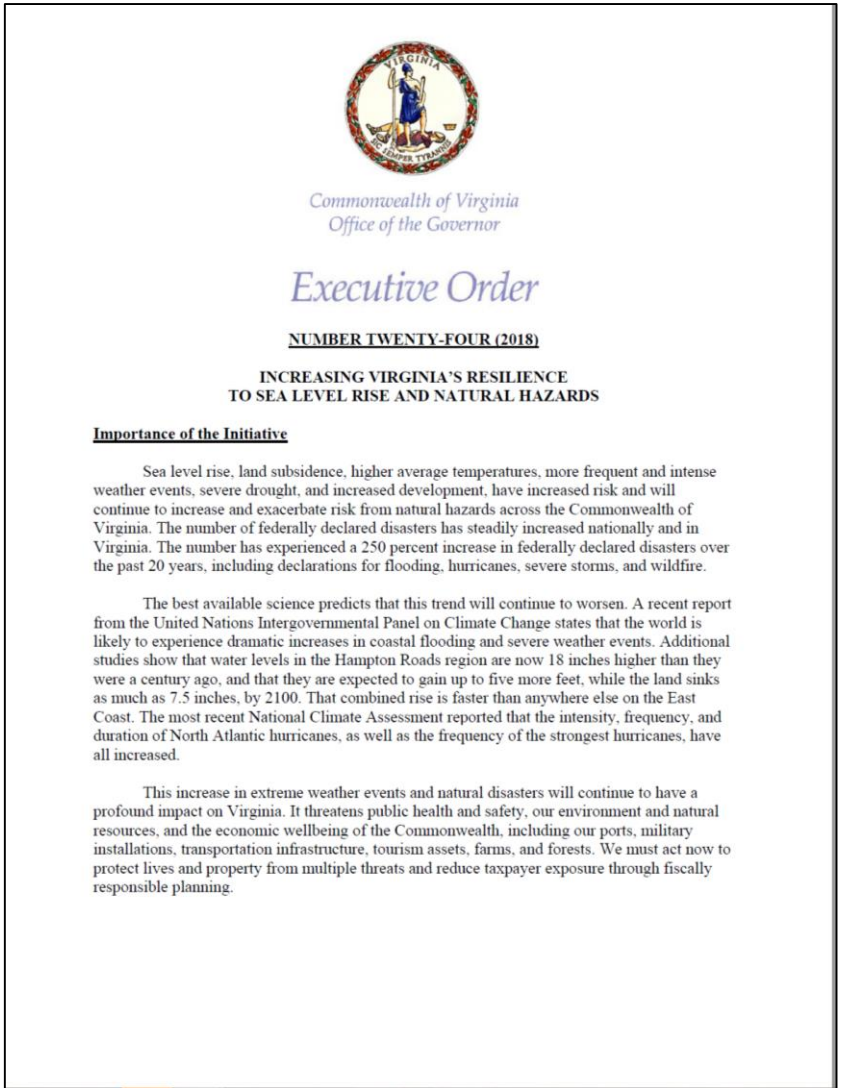
(SCOPE – FLOODING AND SEA LEVEL RISE)

VTRANS VULNERABILITY ASSESSMENT (SCOPE – FLOODING AND SEA LEVEL RISE)

- **Objective:**
 - Conduct a screening-level analysis of the vulnerability of Virginia’s multimodal transportation system to current and future flood hazards.
 - Understand the magnitude of needs required to preserve a resilient and reliable transportation system.
- **Hazards:**
 - Sea level rise, storm surge, inland/riverine flooding

VTRANS VULNERABILITY ASSESSMENT (BACKGROUND)

- Executive Order Number 24 (2018): Increasing Virginia’s Resilience to Sea Level Rise and Natural Hazards
- “This increase in extreme weather events and natural disasters will continue to have a profound impact on Virginia. It threatens ...our ports, military installations, **transportation infrastructure**, tourism assets, farms, and forests.”
- “The Chief Resilience Officer shall work collaboratively within state government and with assistance from regional, state, and national experts and stakeholders, to issue, within 180 days from issuance of this Order, **a regional or statewide sea level rise projection**.....In creating this standard, the Chief Resilience Officer shall consult with: the Secretary of Administration, the Secretary of Commerce and Trade, the Secretary of Finance, **the Secretary of Transportation**, and the **Virginia Institute of Marine Science**” (VIMS).
- A Memorandum of Understanding (MOU) is being developed between the Secretary of Natural Resources (Chief Resilience Officer), Secretary of Transportation, and VIMS.



VTRANS VULNERABILITY ASSESSMENT

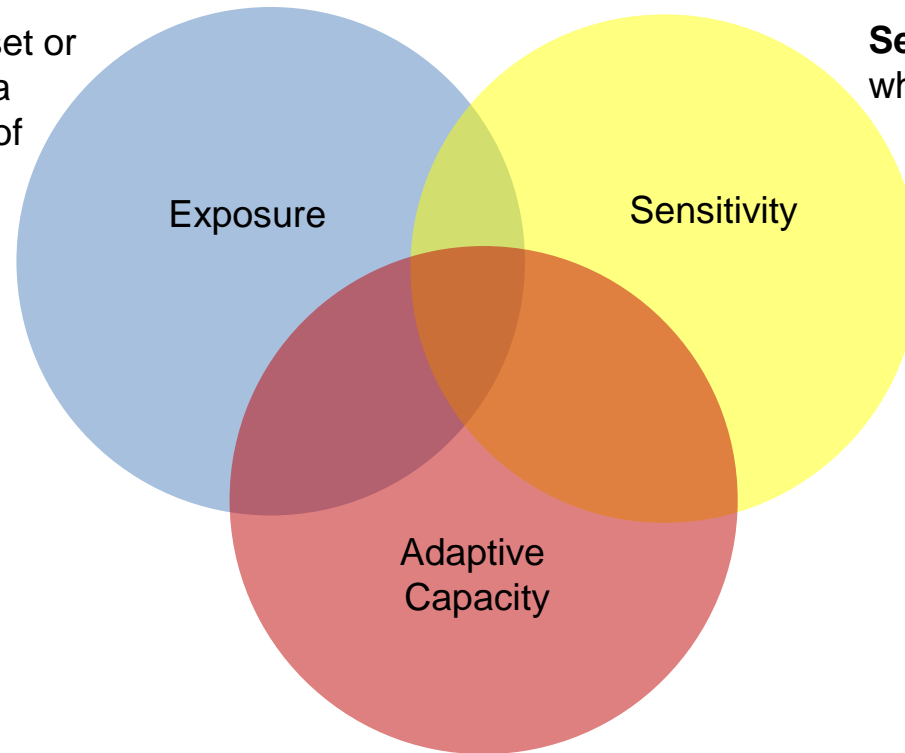
- **DEFINE VULNERABILITY & RESILIENCE**

- Important to establish a common nomenclature and foundational definitions of these terms.
- No standard definition for resilience in the transportation or infrastructure context. However, the definitions used are fundamentally similar across the literature.
 - Definition of Resiliency in *FHWA Order 5520 (2014): Transportation System Preparedness and Resilience to Climate Change and Extreme Weather Events* - Resilience or resiliency is the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions.
- Conducting a review of existing definitions of vulnerability & resilience to inform recommended definitions for VTrans.

VTRANS VULNERABILITY ASSESSMENT

- Vulnerability (FHWA): A function of an asset or systems exposure, sensitivity and adaptive capacity.

Exposure: whether the asset or system is located in an area experiencing direct effects of climate variables.



Sensitivity: how the asset or system fares when exposed to a climate variable.

Adaptive capacity: the system's ability to adjust to or cope with existing climate variability or future climate impacts.

VULNERABILITY ASSESSMENT (DEFINITION OF RESILIENCE)

Examples of existing definitions of resilience

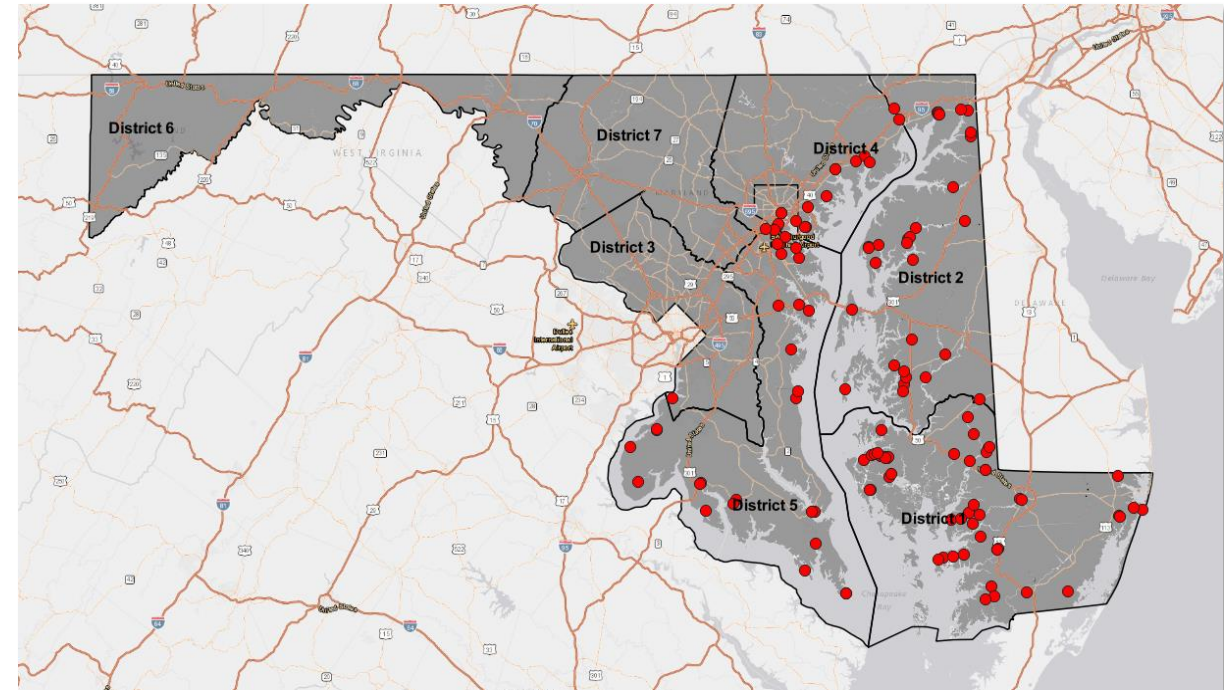
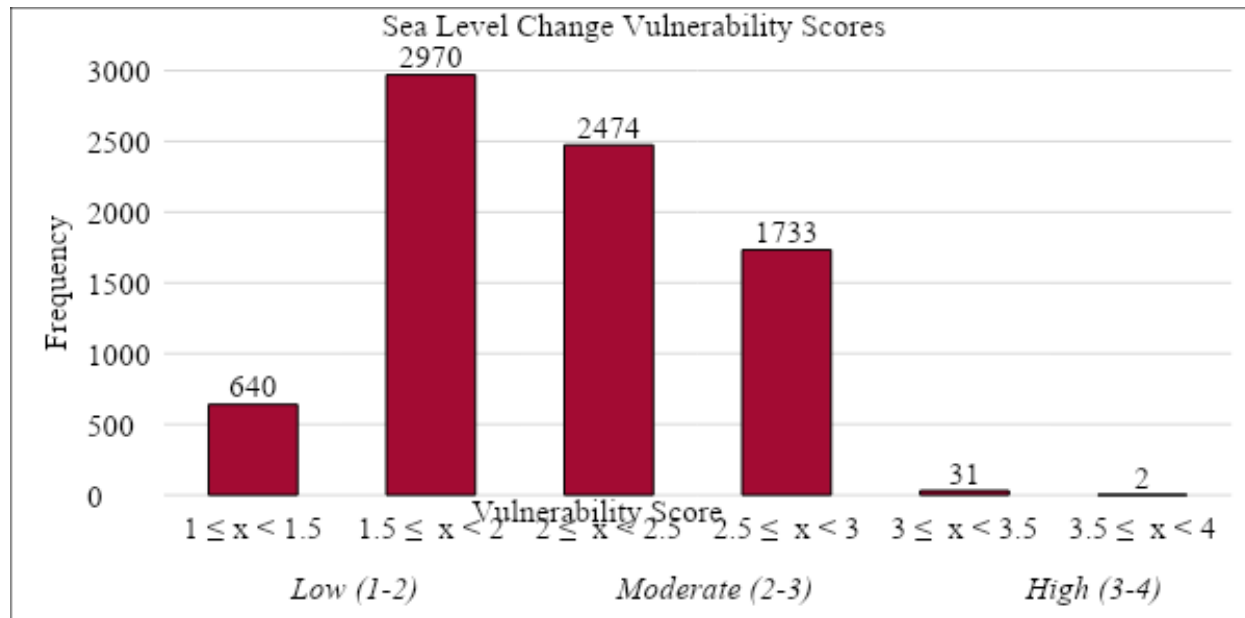
Agency	Definition
Hampton Roads Planning District Commission	The ability to recovery quickly with minimal lasting damage from an event
Minnesota DOT	Reducing vulnerability and ensuring redundancy and reliability to meet essential travel needs
Wisconsin DOT	A resilient transportation system is able to quickly respond to unexpected conditions and return to its usual operational state
USGCRP	A capability to anticipate, prepare for, respond to, and recover from significant multi-hazard threats with minimum damage to social well-being, the economy, and the environment
Colorado DOT	Resiliency incorporates extreme weather, economic adversity, emergency management, and security
Rockingham Planning Commission (Exeter, NH)	Capability to anticipate, prepare for, respond to, and recover from significant multi-hazard threats with minimum damage to social well-being, the economy, and the environment
Arkansas DOT	The ability to reduce the possibility of failure, adapt and recover from a disruptive event and/or gradual external changes over time. It also implies transformation, so not only is the infrastructure service able to survive or recover but it can adapt to a changing environment in which it operates
Delaware DOT	Encompass[ing] the ability to withstand and recover from an incident in order to provide critical transportation services during the incident and through the recovery process
Caltrans	<i>Resilient transportation facilities:</i> Transportation facilities that are designed and operated to reduce the likelihood of disruption or damage due to changing weather conditions.

VTRANS VULNERABILITY ASSESSMENT (LITERATURE REVIEW)

- **Objective:**
 - Ensure consistency in the methodology and data used with other assessments.
 - Build upon the findings of past studies:
 - **Multi-state and statewide assessments**
 - Commonwealth of Virginia Hazard Mitigation Plan
 - Recurrent Flooding Study for Tidewater Virginia
 - Virginia and the Surging Sea: A vulnerability assessment with projections for sea level rise and coastal flood risk
 - Climate Change Vulnerabilities in the Coastal Mid-Atlantic Region
 - **Local assessments**
 - Numerous Hampton Roads studies on sea level rise
 - Eastern Shore of Virginia Transportation Infrastructure Inundation Vulnerability Assessment

VTRANS VULNERABILITY ASSESSMENT (OUTCOMES)

- Maps and spreadsheets/charts of most and least vulnerable assets
 - For example, Maryland DOT State Highway Administration's results are visualized as follows:



Source: MDOT SHA



REAFFIRMATION OF VTRANS GUIDING PRINCIPLES, VISION, GOALS & OBJECTIVES

VTRANS GUIDING PRINCIPLES (GP)

GP 1: Optimize Return on Investments

Implement the right solution at the right price, striving to meet current needs while advancing long-term prosperity and livability.

GP 2: 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.

GP 3: Efficiently Deliver Programs

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.

VTRANS GUIDING PRINCIPLES (GP)

GP5: Ensure Transparency and Accountability, and Promote Performance Management

Work openly with partners and engage stakeholders in project development and implementation, and establish performance targets that consider the needs of all communities, measure progress towards targets, and to 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

VTRANS 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.

VTRANS VISION | PUBLIC COMMENTS

- Received a handful of comments suggestions.
 - Drop “Good to go”
 - Add “Equity or Fairness”, “Good for Mobility”
 - Include environmental values in vision and goals



What's your vision?

In 2015, the Commonwealth Transportation Board adopted a Vision, Guiding Principles, and Goals to guide VTrans2040. In our fast-moving world, a lot has happened since 2015. For this VTrans update, should we revisit the Vision? Is it time to rethink any of the Guiding Principles or Goals? Tell us what you think by jotting down your thoughts on this sheet.

What's a vision statement?

A vision statement describes the optimal future that all of us, working together, want to bring about. An inspiring picture of what we want to accomplish over time, the vision statement motivates and guides everyone involved in achieving it. It provides a focal point that helps each partner agency and stakeholder to align its own plans and actions with the desired future outcomes, and to stay true to the course during the long journey toward success.

Why might we want to change the vision?

It's important to step back every so often and assess the meaning and relevance of a previously adopted vision statement, given the values, needs, and desires of today's Virginians. Regardless of whether we make any changes to the words, we need to make sure the vision—and the goals that support it—represents our very best aspiration for the world in which future generations of Virginians will live.

WHAT DO YOU THINK? CHECK OPTION A, B, OR C, AND SHARE YOUR IDEAS.

VTrans2040 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.

A This is just right – keep as is!
B It's pretty good, but I'd suggest dropping, adding, or changing a few things.

Drop:

Add:

Change:

C My vision is really different. Here's how I'd describe Virginia's ideal future:
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VTRANS GOALS

**VTrans2040
Goals**





MID-TERM NEEDS ASSESSMENT

MID-TERM NEEDS ASSESSMENT | TRAVEL MARKETS REVIEW

- **Corridors of Statewide Significance (CoSS)** [Code of Virginia [§ 33.2-353](#)]
 - Serve inter-regional travel
- **Regional Networks** [Code of Virginia in in [§ 33.2-353](#)]
 - Serve commuters, intra-regional, and local travel
- **Urban Development Areas (UDA)** [Code of Virginia [§ 33.2-353](#) and [§ 15.2-2223.1](#)]
 - Designated by local governments
 - Intended to promote walkable development and traditional neighborhood design
- **Safety**
- **Additional work underway to identify needs associated with local economic and industrial development areas**

Corridors of Statewide Significance*

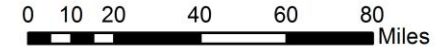
- Coastal Corridor
- Crescent Corridor
- East-West Corridor
- Eastern Shore Corridor
- Heartland Corridor
- North Carolina to West Virginia Corridor
- North-South Corridor
- Northern Virginia Corridor
- Seminole Corridor
- Southside Corridor
- Washington to North Carolina Corridor
- Western Mountain Corridor

*Thin lines of same color represent Corridor Component Facilities

-  Airports
-  Ports
-  Rail Network

Travel Markets:

Corridors of Statewide Significance serve inter-regional travel.



Corridors of Statewide Significance*

- Coastal Corridor
- Crescent Corridor
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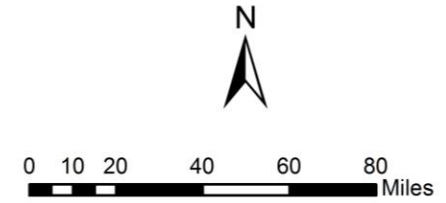
*Thin lines of same color represent Corridor Component Facilities

- Airports
- Ports
- Rail Network
- Regional Networks

Travel Markets:

Corridors of Statewide Significance serve inter-regional travel.

Regional Networks serve commuters, intra-regional and local travel.



Corridors of Statewide Significance*

- Coastal Corridor
- Crescent Corridor
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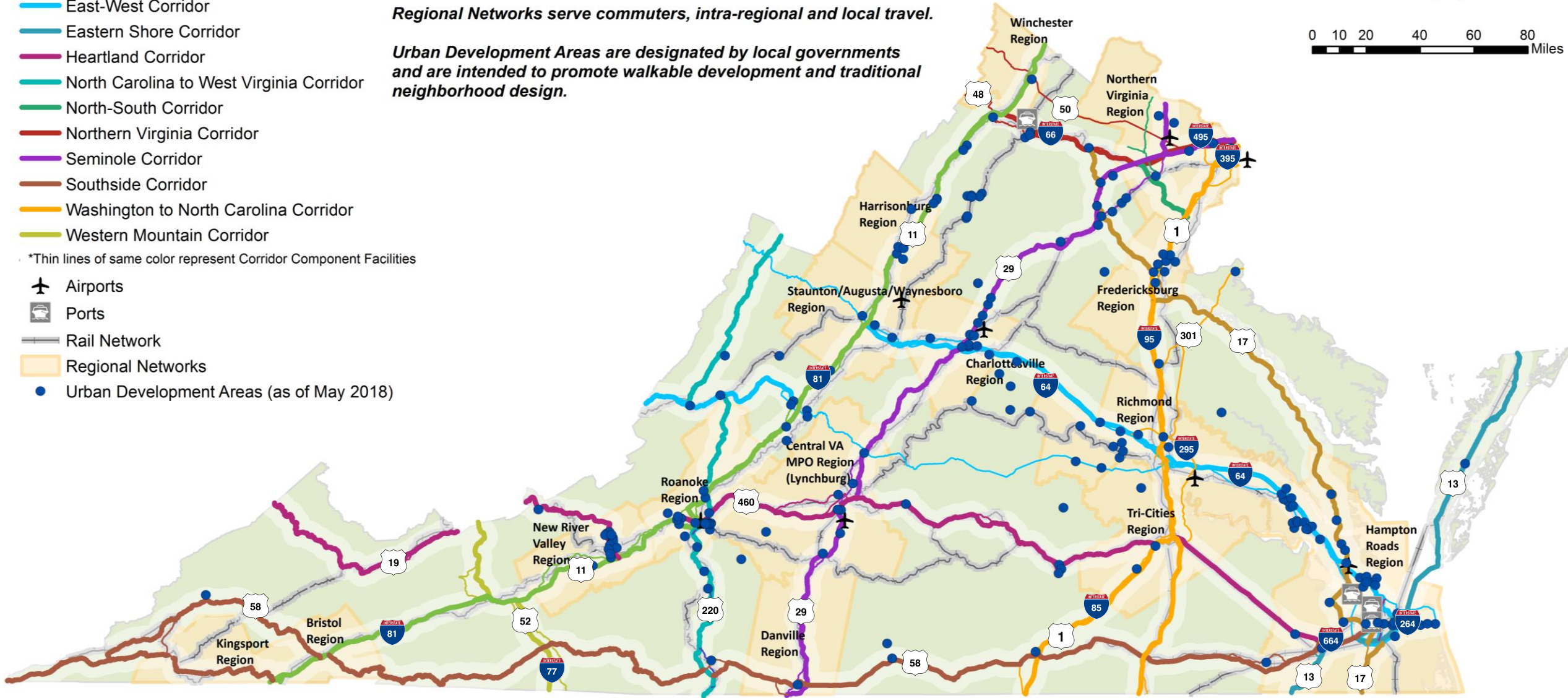
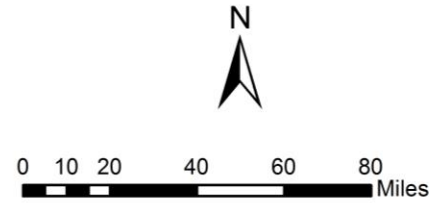
- Airports
- Ports
- Rail Network
- Regional Networks
- Urban Development Areas (as of May 2018)

Travel Markets:

Corridors of Statewide Significance serve inter-regional travel.

Regional Networks serve commuters, intra-regional and local travel.

Urban Development Areas are designated by local governments and are intended to promote walkable development and traditional neighborhood design.



MID-TERM NEEDS VS. LONG-TERM NEEDS

Mid-Term Needs	Long-Term Needs
7 - 10 year time horizon	10 + year time horizon
Performance measures with current data to determine	Performance measures through scenario analysis with forecast data to determine
Used as screening criteria for SMART SCALE	Used to inform policy, planning and project recommendations to prepare for 10+ years out
Action requested by December 2019	Expect to request action in 2020 or 2021

Mid-Term Needs Approach:

- Validate and build upon needs identified in VTrans2040 (travel markets)
- Tie measures to VTrans Goals and Objectives
- Introduce new/improved data sources and new measures in line with federal performance reporting requirements
- Coordinate with regional and local stakeholders to update needs



Mid-Term Needs Approach by Travel Markets:

- Corridors of Statewide Significance (CoSS) – more data-driven, smaller segments than last time
- Regional Networks (RN) – build on VTrans2040, verify, update, confirm/revise
- Urban Development Areas (UDAs) – build on VTrans2040, verify, update, confirm/revise
- Safety – Potential for Safety Improvements (PSI) statewide




MID-TERM NEEDS ASSESSMENT | VTRANS GOALS

VTrans Goals




-  Goals with measures that will be used for *identification of Mid-term Needs*
-  Goals with measures that will be used for *trends analysis*


MID-TERM NEEDS ASSESSMENT | DRAFT NEEDS IDENTIFICATION MEASURES

Goal	Mid-Term Needs Measures
 Economic Competitiveness	<ul style="list-style-type: none"> Congestion measure(s) Reliability measure(s) Economic development measure Passenger Rail On-time Performance
 Accessible Places	<ul style="list-style-type: none"> Accessibility measure(s) Disadvantaged communities beyond ¼ mile access to transit
 Safety	<ul style="list-style-type: none"> PSI – Potential for safety improvements

MID-TERM NEEDS ASSESSMENT | DRAFT TRENDS ANALYSIS MEASURES

Goal	Mid-Term Measures for Trends Analysis
 Proactive System Management	Percentage of bridge deck area in good condition
	Percentage of bridge deck area in poor condition
	Percentage of roadway pavement in good condition
	Percentage of roadway pavement in poor condition
	Rolling Stock: The percentage of revenue vehicles (by type) that exceed the useful life benchmark (ULB).
	Equipment: The percentage of non-revenue service vehicles (by type) that exceed the ULB.
	Facilities: The percentage of facilities (by group) that are rated less than 3.0 on the Transit Economic Requirements Model (TERM) Scale.
	Infrastructure: The percentage of track segments (by mode) that have performance restrictions.

MID-TERM NEEDS ASSESSMENT | DRAFT TRENDS ANALYSIS MEASURES

Goal	Mid-Term Measures for Trends Analysis
 Healthy / Sustainable Communities	Per Capita VMT
	Percentage of passenger fleet composed of low-emitting vehicles (hybrids or electric vehicles)

MID-TERM NEEDS ASSESSMENT | SUMMARY REVIEW

	CoSS	Regional Networks	UDA	Safety (Statewide)
Starting Point	Full Analysis of CoSS	VTrans2040 RN needs	VTrans2040 UDA needs	Full analysis of PSI locations
How will measures be used?	Identification of new needs	Confirmation of previously identified needs and identification of new needs	Needs must support UDA legislative requirements (§ 15.2-2223.1)	Identification of new needs
Stakeholder engagement required	Review and comment on identified needs	Regional workshops for needs identification with MPOs, PDCs, and localities	Survey/Needs questionnaire with localities	Review and comment on identified needs



OUTREACH AND ENGAGEMENT

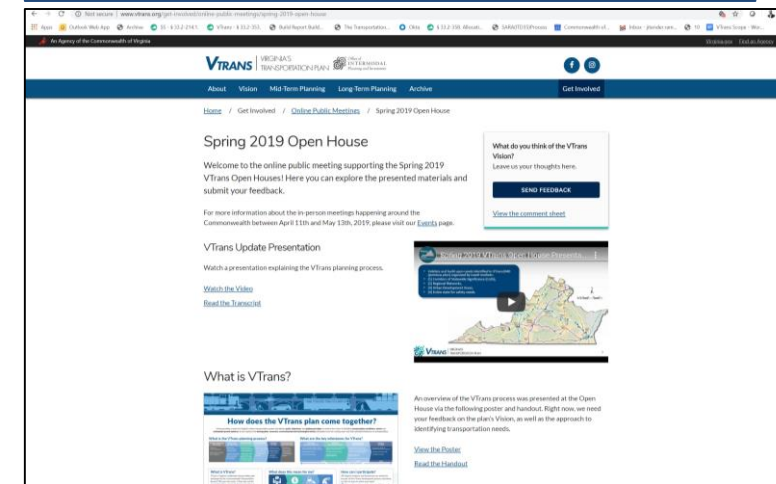
COORDINATION WITH MODAL AGENCIES

- Management-level internal group
- Representation from DRPT and VDOT multimodal divisions
- Objective is inform VTrans development, developed a shared understanding and coordination of policies and priorities



OUTREACH AND ENGAGEMENT – PUBLIC OPEN HOUSES

- Spring 2019 Open House Attendance
 - Nine in-person meetings
 - One online meeting
- Facebook Ad Promotion
 - Total Reach: > 200,000
 - Total Link Clicks: > 5,000
- ~ 8,000 VTrans page views
 - Online meeting visited by over 3,000



OUTREACH AND ENGAGEMENT – MPOs AND PDCs

- Round 1 – VTrans Kickoff and Approach [Nov 2018 – Feb 2019]
 - 21 Meetings
 - 13 MPOs
 - 7 PDCs
 - State Bicycle/Pedestrian Advisory Committee
 - NVTA
 - VAMPO
- Round 2 – Mid-Term Needs Assessment [May – June 2019]
 - 17 Meetings
 - 14 MPOs
 - 1 PDC
 - NVTA
 - 1 online meeting
 - VAMPO and VAPDC



OUTREACH AND ENGAGEMENT – SUMMARY OF FEEDBACK RECEIVED

- Include routes that are currently outside Regional Networks (RN) Areas
- Include need associated with activity centers that are outside Regional Networks (RN) areas
- Revisit CoSS designation
- Include vulnerability analysis related considerations in needs identification
- General questions about how I-81 and I-95 corridor plans relate to VTrans



SCHEDULE AND NEXT STEPS



NEXT STEPS | SCHEDULE AND MILESTONES

Date	VTrans Task	Public and Agency Feedback	Opportunities for CTB to Engage
July	July CTB Workshop: Present Performance Measures for VTrans Needs Identification	Opportunity for public and agencies to comment	Review and provide direction
Mid-July - early August	Regional Workshops: Draft Mid-Term Needs development	Local and regional entities provide input on draft mid-term needs assessment	Attend and provide direction at Regional Workshops
October	October CTB Workshop: Present draft needs and any feedback we've heard	Opportunity for public and agencies to comment	Review and provide direction
September to November	OIPI Staff visits to MPO's: Discuss draft Mid-Term Needs	Feedback from PDCs without MPOs; localities that are not represented on MPO boards	

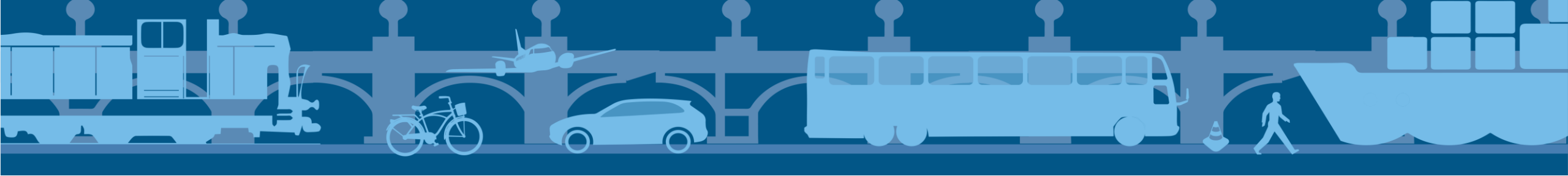




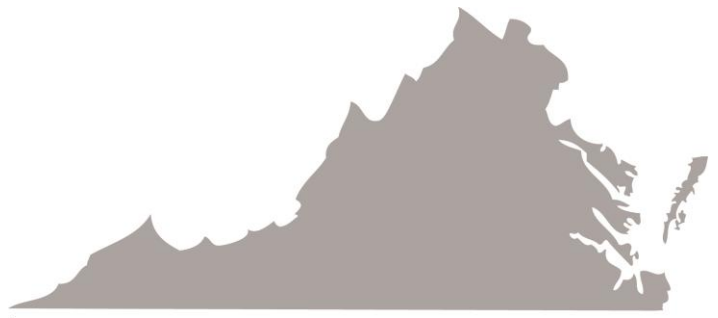
NEXT STEPS | SCHEDULE AND MILESTONES

Date	VTrans Task	Public and Agency Feedback	Opportunities for CTB to Engage
October/ November	Fall Transportation Meetings	Attend/Provide comments	Attend and provide direction at Regional Workshops
December 11 th	December CTB Meeting: CTB takes action on Vision, Goals, Objectives, measures, needs methodology, and Mid-term Needs list	Opportunity for public and agencies to comment	Attend and take action
Before end of 2019	Upon CTB's approval, publish final approved list of Mid-Term Needs	N/A	N/A





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