



COMMONWEALTH of VIRGINIA
Office of the
SECRETARY of TRANSPORTATION

VTrans Freight Element

Freight Subcommittee: The National Capital Region Transportation Planning Board (TPB)

Jitender Ramchandani, Office of Intermodal Planning and Investment (OIPI)

March 10, 2022



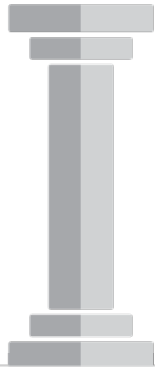
PURPOSE OF THIS PRESENTATION

- **This presentation focuses on the VTrans Freight Element, which also fulfills requirements for a Statewide Freight Plan.**
- **This presentation covers the following subjects:**
 - Context and background
 - Approach to freight planning
 - Identification of Freight Issues
 - Delivery mechanism
 - Next steps related to freight considerations

CONTEXT AND BACKGROUND | FOCUS AREAS

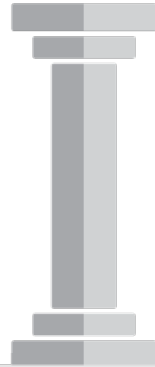
- **VTrans is Virginia's multimodal transportation plan and has four focus areas.**
 - The Office of Intermodal Planning and Development (OIPD) assists the Commonwealth Transportation Board (CTB) in the development of the plan.

1
CTB's Vision, Guiding Principles, Goals and Objectives



Guides needs and risk identification
Forms basis for Key Performance Indicators

2
VTrans Mid-term Needs: Identification and Prioritization

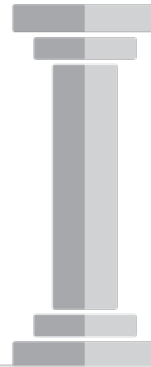


Informs allocation of dollars



Revenue Sharing

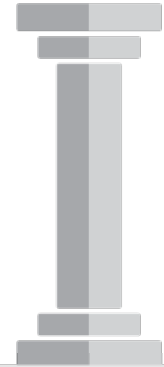
3
VTrans Long-term Risk & Opportunity Register



Identifies long-term risks and opportunities

Monitors trends

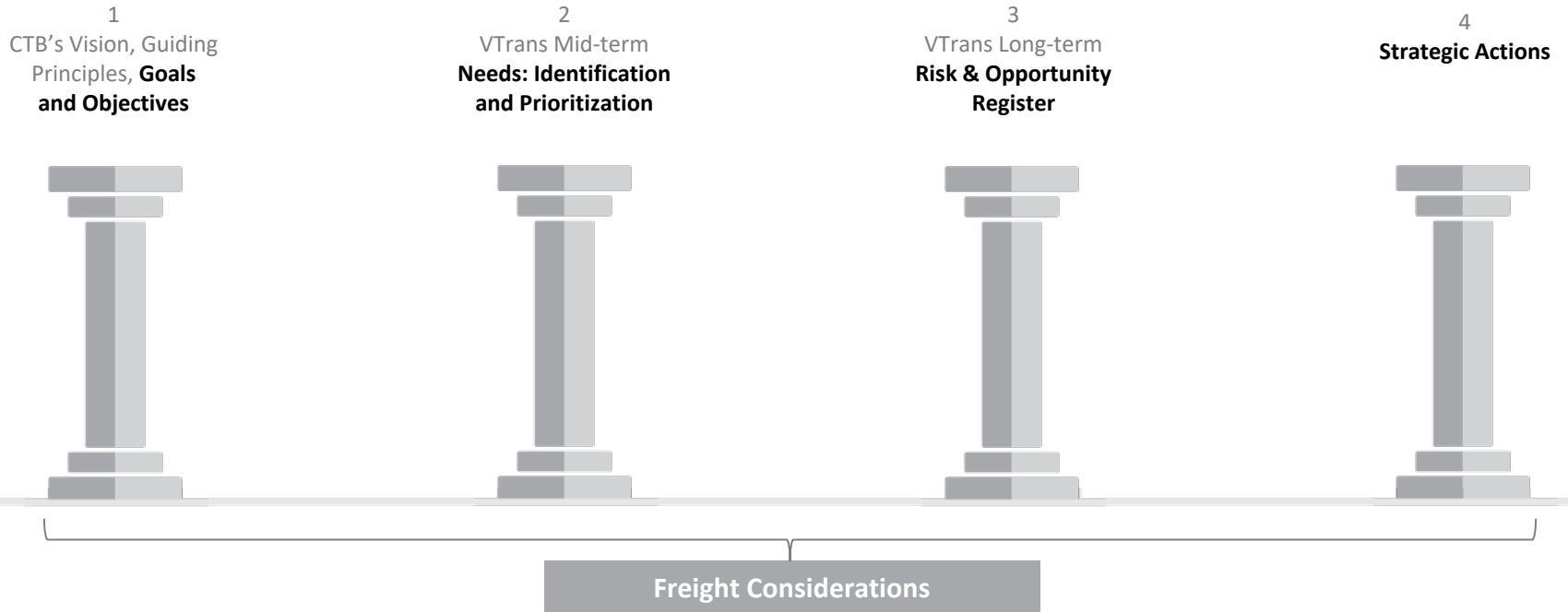
4
Strategic Actions



Informs agency business plans

CONTEXT AND BACKGROUND | FOCUS AREAS AND FREIGHT CONSIDERATIONS

- Freight considerations are embedded in all focus areas.





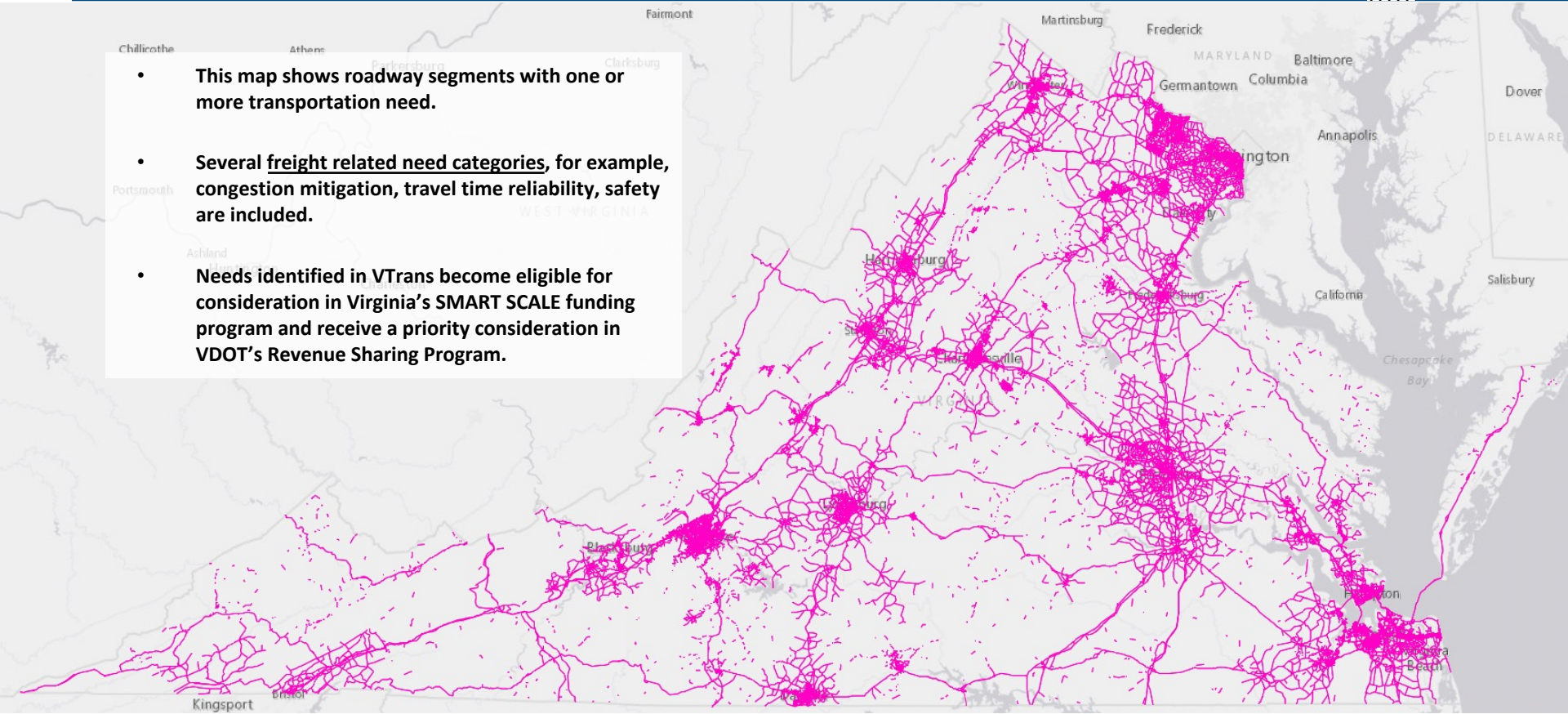
- Freight considerations in the VTrans Focus Area # 1: Goals, and Objectives

GOALS	OBJECTIVES*
Goal A: Economic Competitiveness and Prosperity	<ul style="list-style-type: none"> Reduce the amount of travel that takes place in severe congestion Reduce the number and severity of freight bottlenecks Improve reliability on key corridors for all modes
Goal B: Accessible and Connected Places	<ul style="list-style-type: none"> Reduce average peak-period travel times in metropolitan areas Reduce average daily trip lengths in metropolitan areas Increase the accessibility to jobs via transit, walking, and driving in metropolitan areas
Goal C: Safety for All Users	<ul style="list-style-type: none"> Reduce the number and rate of motorized fatalities and serious injuries Reduce the number of non-motorized fatalities and serious injuries
Goal D: Proactive System Management	<ul style="list-style-type: none"> Improve the condition of all bridges based on deck area Increase the lane miles of pavement in good or fair condition Increase percent of transit vehicles and facilities in good or fair condition
Goal E: Healthy and Sustainable Transportation Communities	<ul style="list-style-type: none"> Reduce per-capita vehicle miles traveled Reduce transportation related NOX, VOC, PM, and CO emissions Increase the number of trips traveled by active transportation (bicycling and walking)

* Bolded black text indicate freight considerations

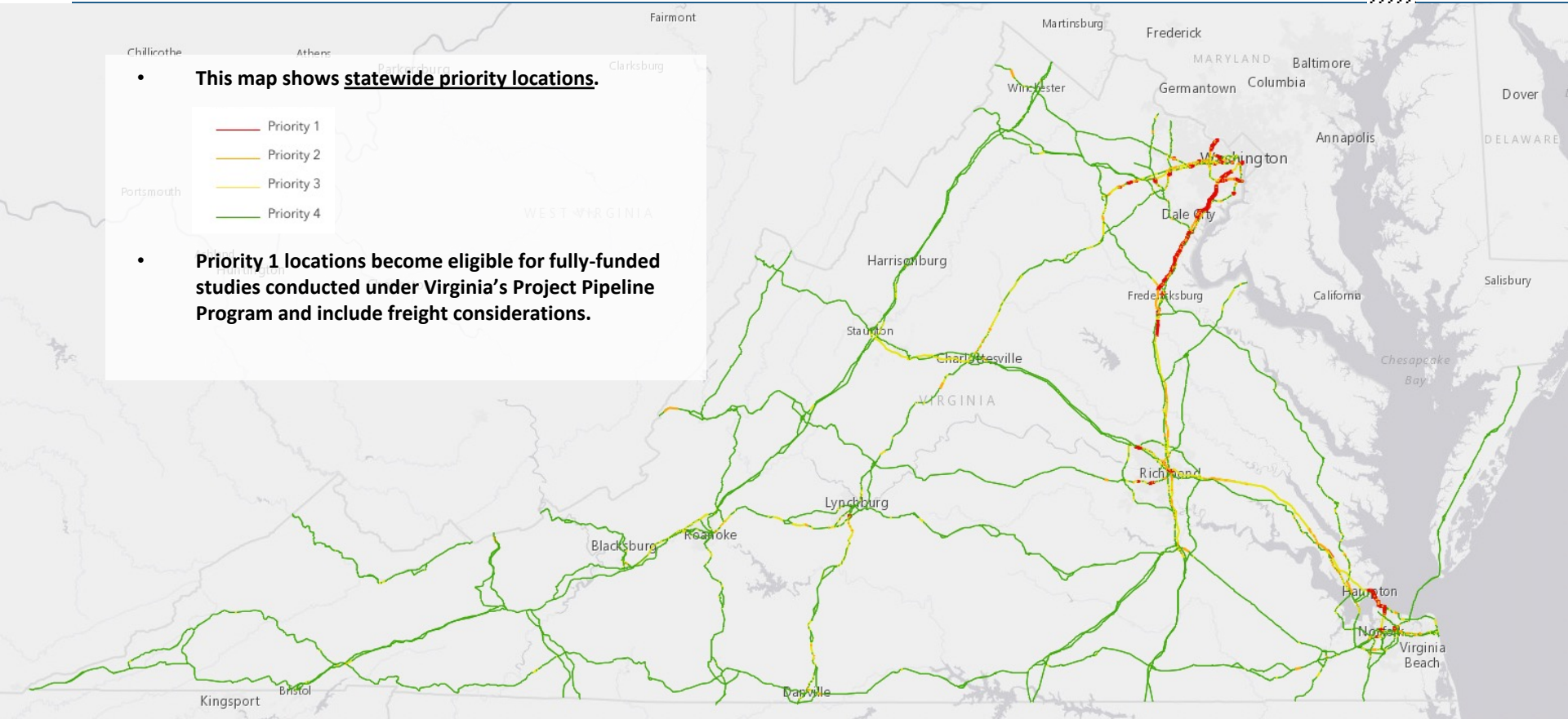


- This map shows roadway segments with one or more transportation need.
- Several freight related need categories, for example, congestion mitigation, travel time reliability, safety are included.
- Needs identified in VTrans become eligible for consideration in Virginia's SMART SCALE funding program and receive a priority consideration in VDOT's Revenue Sharing Program.



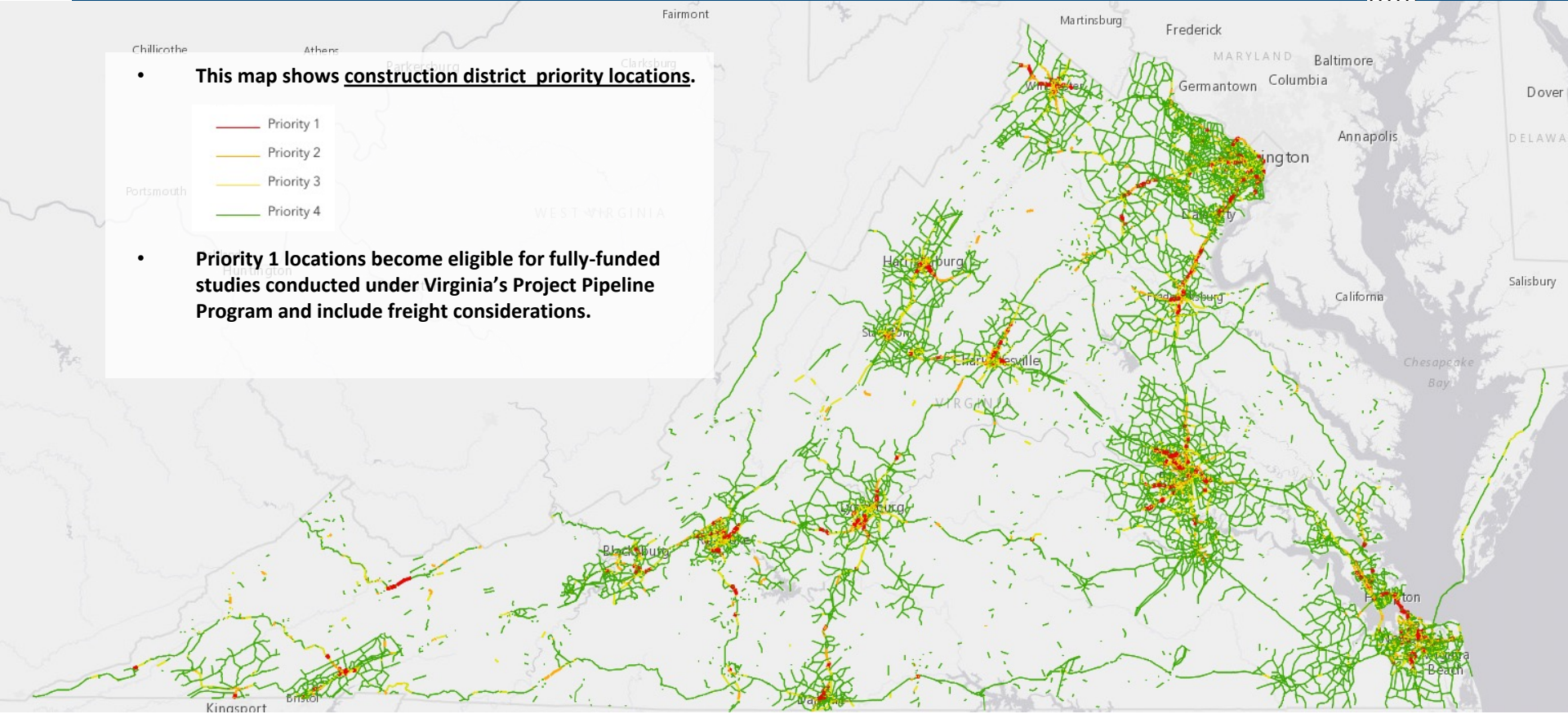


- This map shows **statewide priority locations**.
 - Priority 1
 - Priority 2
 - Priority 3
 - Priority 4
- **Priority 1 locations become eligible for fully-funded studies conducted under Virginia's Project Pipeline Program and include freight considerations.**





- This map shows construction district priority locations.
 - Priority 1
 - Priority 2
 - Priority 3
 - Priority 4
- Priority 1 locations become eligible for fully-funded studies conducted under Virginia's Project Pipeline Program and include freight considerations.





- These mega and macrotrends inform the policy for the Development + Monitoring of Long-term Risk & Opportunity Register.

MEGATREND



CLIMATE



TECHNOLOGICAL
ADVANCEMENTS




CHANGE IN
CONSUMPTION
PATTERNS



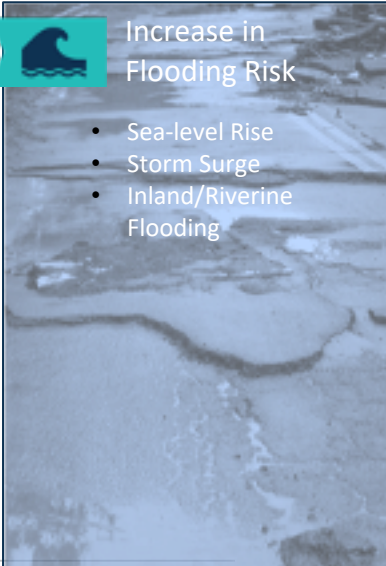
SOCIO-DEMOGRAPHIC /
EMPLOYMENT
CHANGES

MACROTREND



Increase in Flooding Risk

- Sea-level Rise
- Storm Surge
- Inland/Riverine Flooding




Adoption of Highly Autonomous Vehicles




Adoption of Electric Vehicles



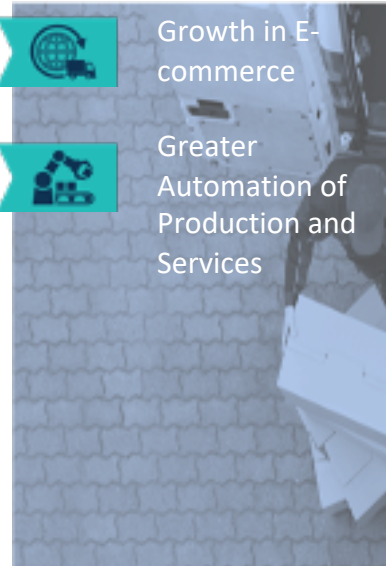
Growth in Shared Mobility




Growth in E-commerce



Greater Automation of Production and Services




Growth of Professional Service Industry



Increase in Workplace Flexibility



Growth of the 65+ Cohort








Population and Employment Shift





- Freight considerations are embedded in the analysis (refer to table).

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%	

VTrans.org > InteractVTrans > [Data Explorer](#)



- **The CTB has adopted 16 Strategic Actions, known as 2021 VTrans Strategic Actions. Freight considerations embedded in 10 actions.**

- **Approach to Freight Plan / Planning**

- Ensure that planning reflects the role of public sector given that freight movements are impacted factors such as:
 - Macroeconomic conditions
 - International trade and commerce
 - Competitive push/pull in the private sector for profit maximization
 - Competitive push/pull at the points of entry
 - Ever changing consumer demand and behavior
 - Infrastructure improvements in other states

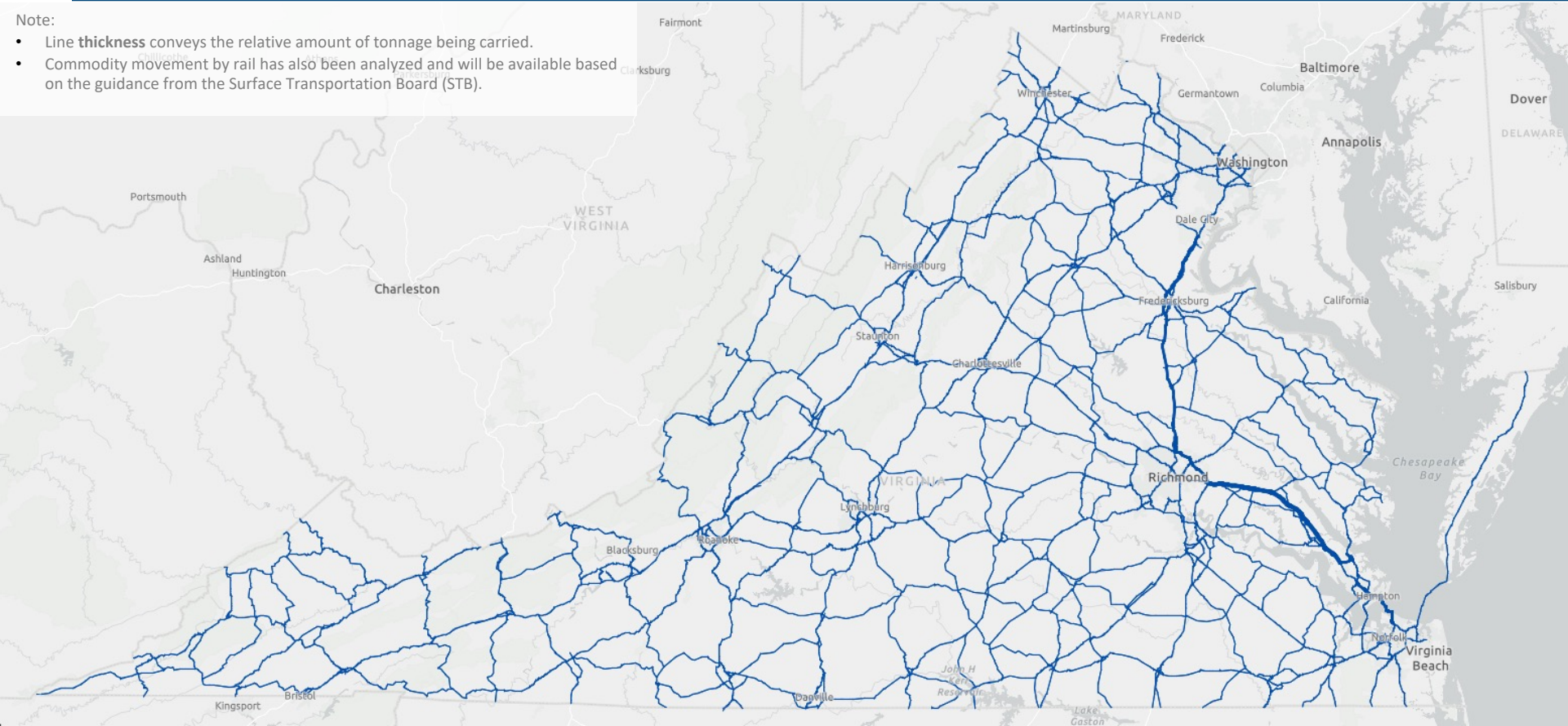
- **Approach to Freight Plan / Planning (cont.)**

- Focus on the identification of with needs that may directly or indirectly impact flow of freight/cargo/commodities within and through the Commonwealth
 - The private sector plays a large role in providing services to facilitate the movement of freight. Datasets from private companies are often limited or proprietary in nature, with restrictions related to access and dissemination.
 - Potentially use this effort to further refine the adopted Policy for the Identification of VTrans Mid-term Needs so that these locations can become eligible for funding through SMART SCALE.
- Increase awareness of the identified needs so that they can be better reflected or considered as part of metropolitan planning processes

IDENTIFICATION OF FREIGHT ISSUES | COMMODITY FLOWS – INTERNAL TO INTERNAL

Note:

- Line **thickness** conveys the relative amount of tonnage being carried.
- Commodity movement by rail has also been analyzed and will be available based on the guidance from the Surface Transportation Board (STB).



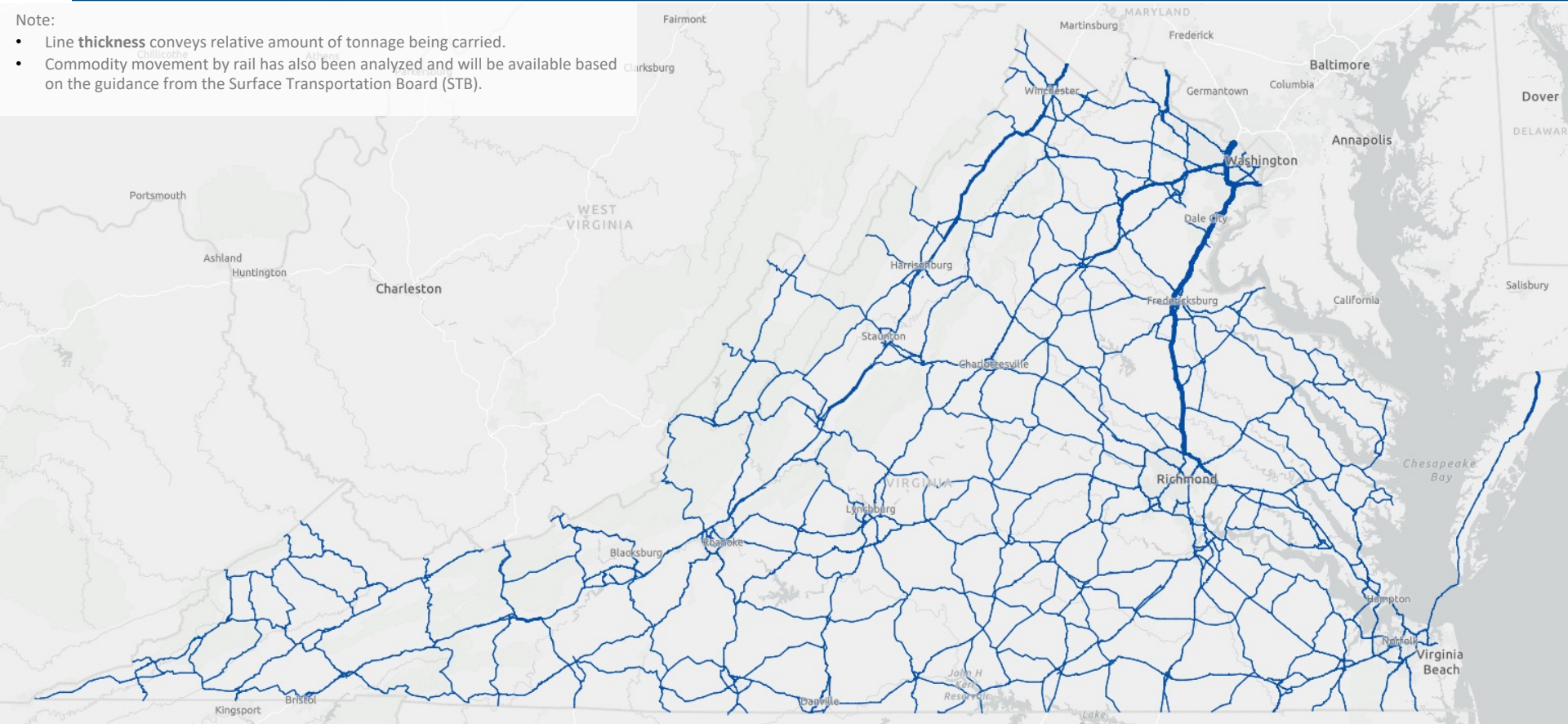
Source: Transearch, 2017

VTrans.org > InteractVTrans > MapExplorer > Layer "[Freight Performance Measures](#)"

IDENTIFICATION OF FREIGHT ISSUES | COMMODITY FLOWS – INTERNAL TO EXTERNAL

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- Line **thickness** conveys relative amount of tonnage being carried.
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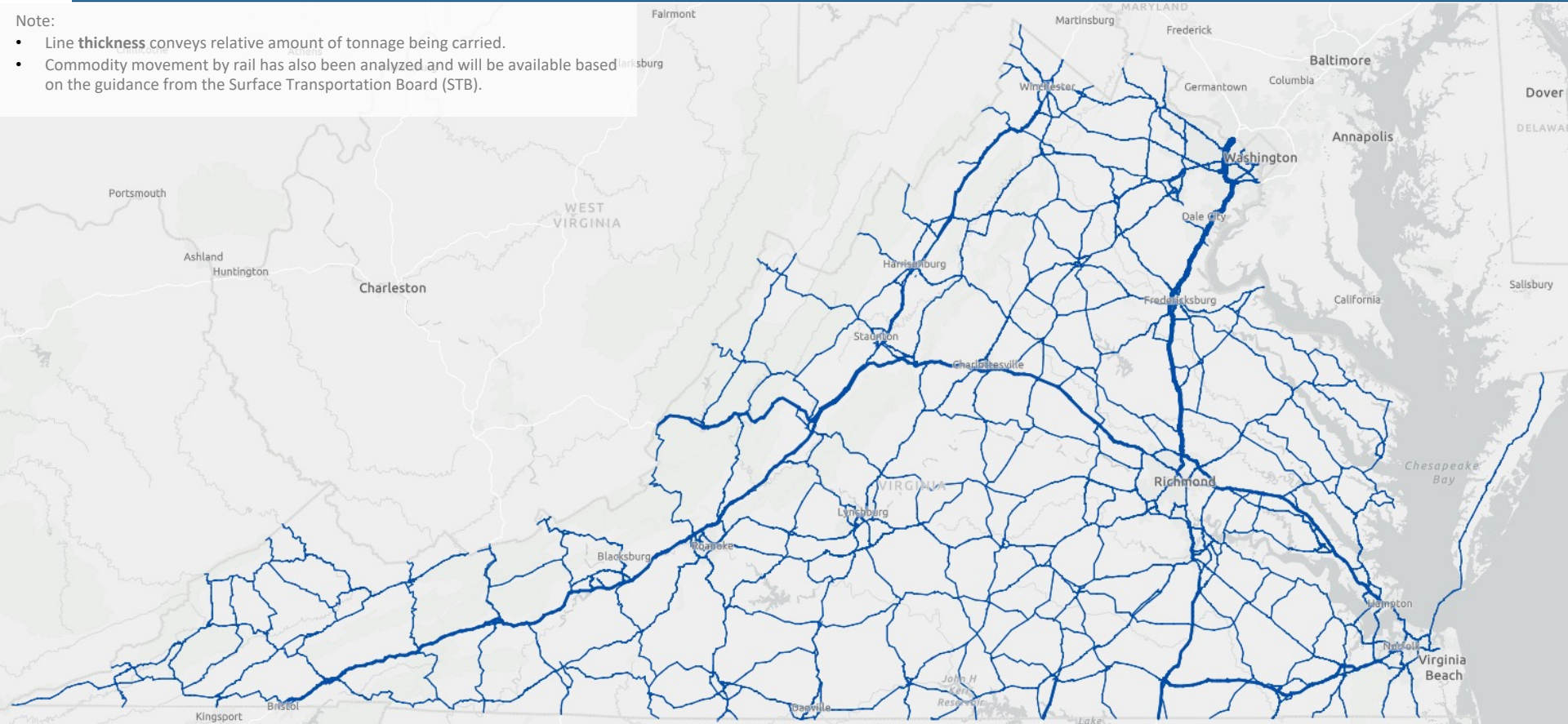
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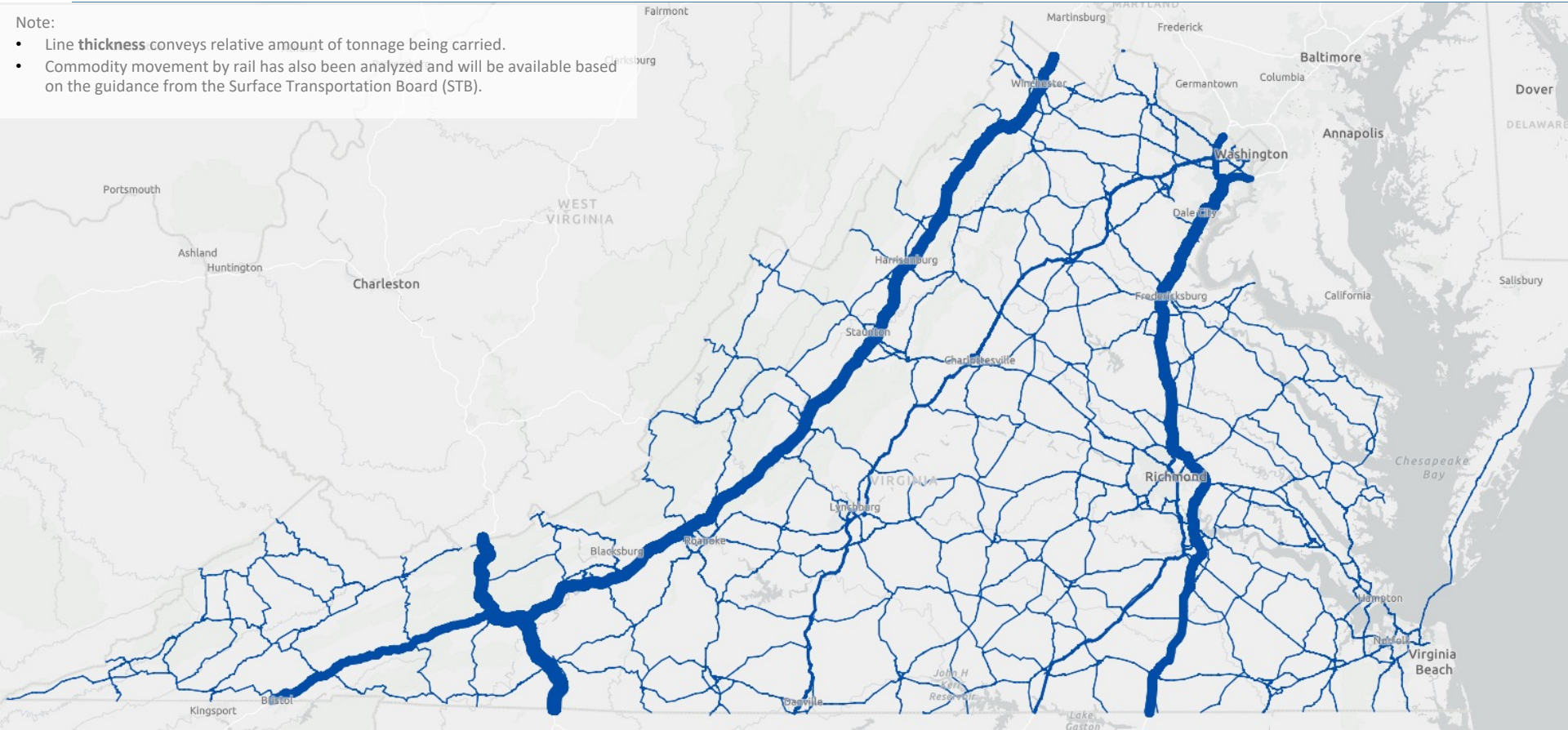


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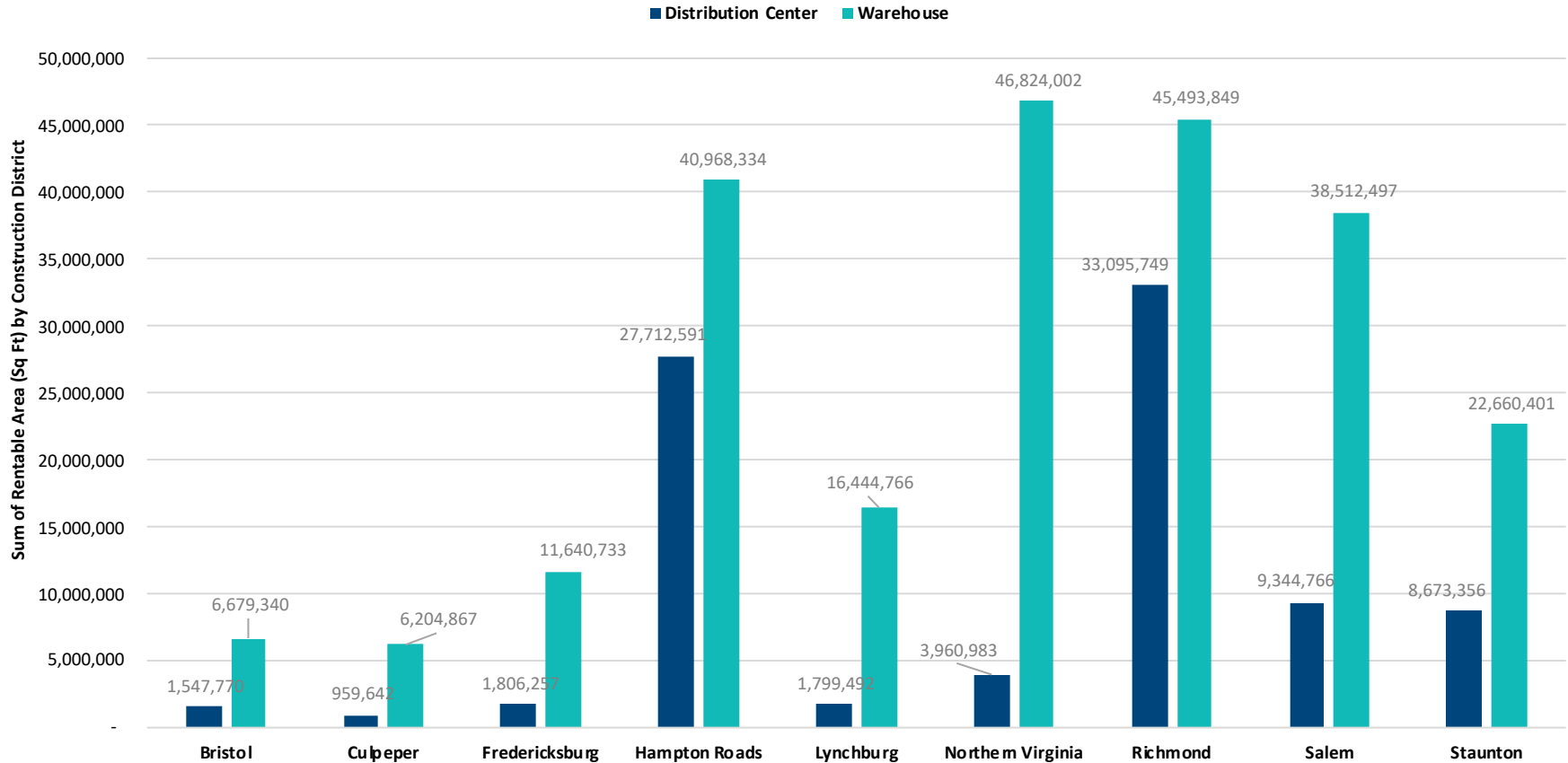
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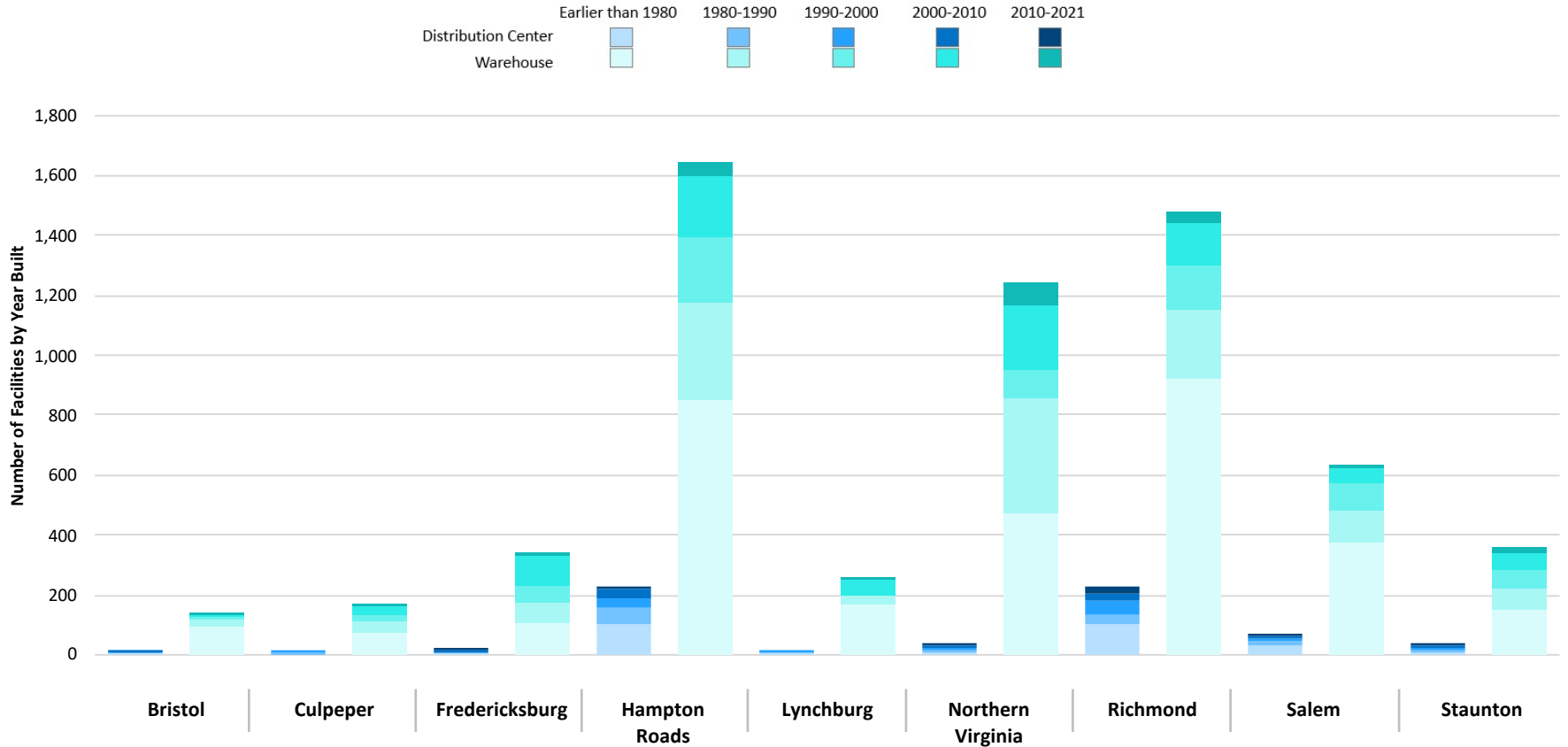
Source: Transearch, 2017

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IDENTIFICATION OF FREIGHT ISSUES | STORAGE AND DISTRIBUTION – TOTAL RENTABLE AREA



IDENTIFICATION OF FREIGHT ISSUES | STORAGE AND DISTRIBUTION – NUMBER OF FACILITIES

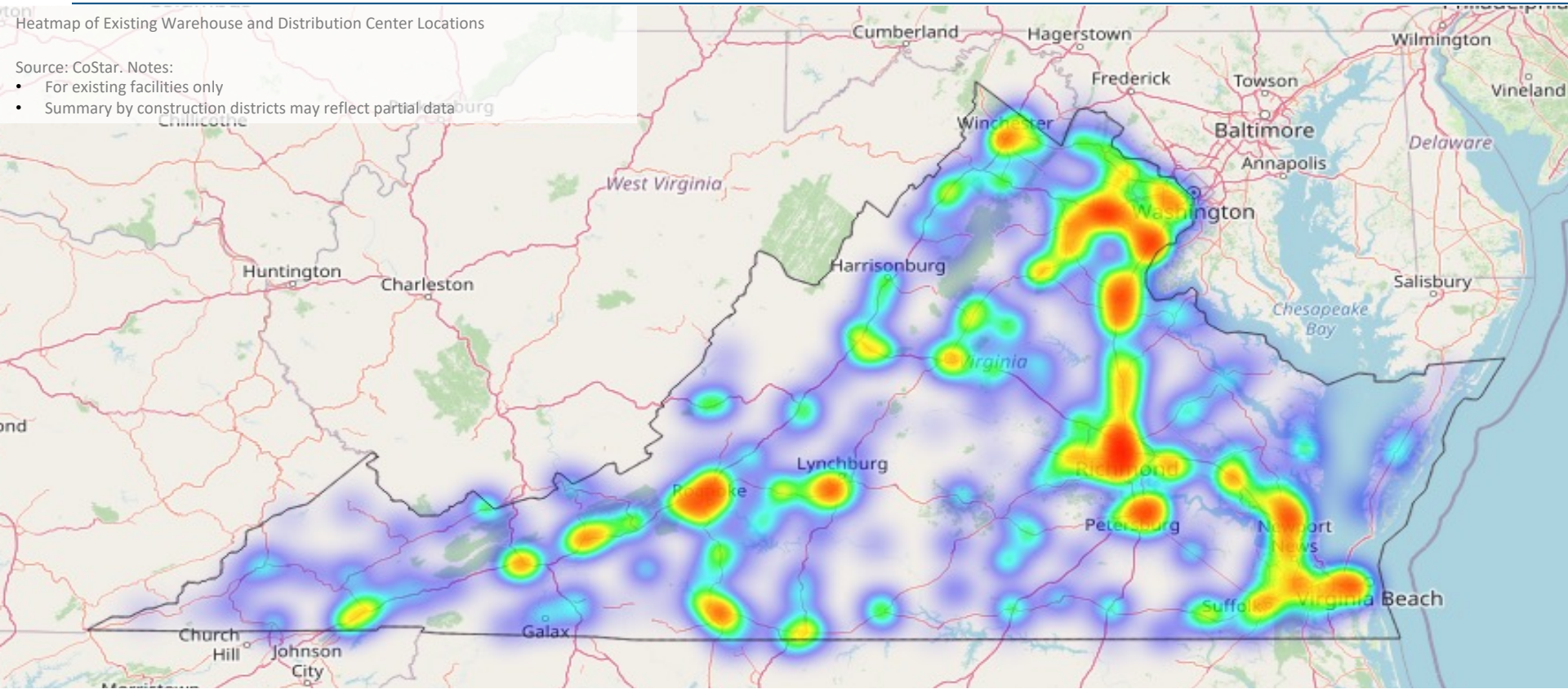


IDENTIFICATION OF FREIGHT ISSUES | STORAGE AND DISTRIBUTION – CONCENTRATION

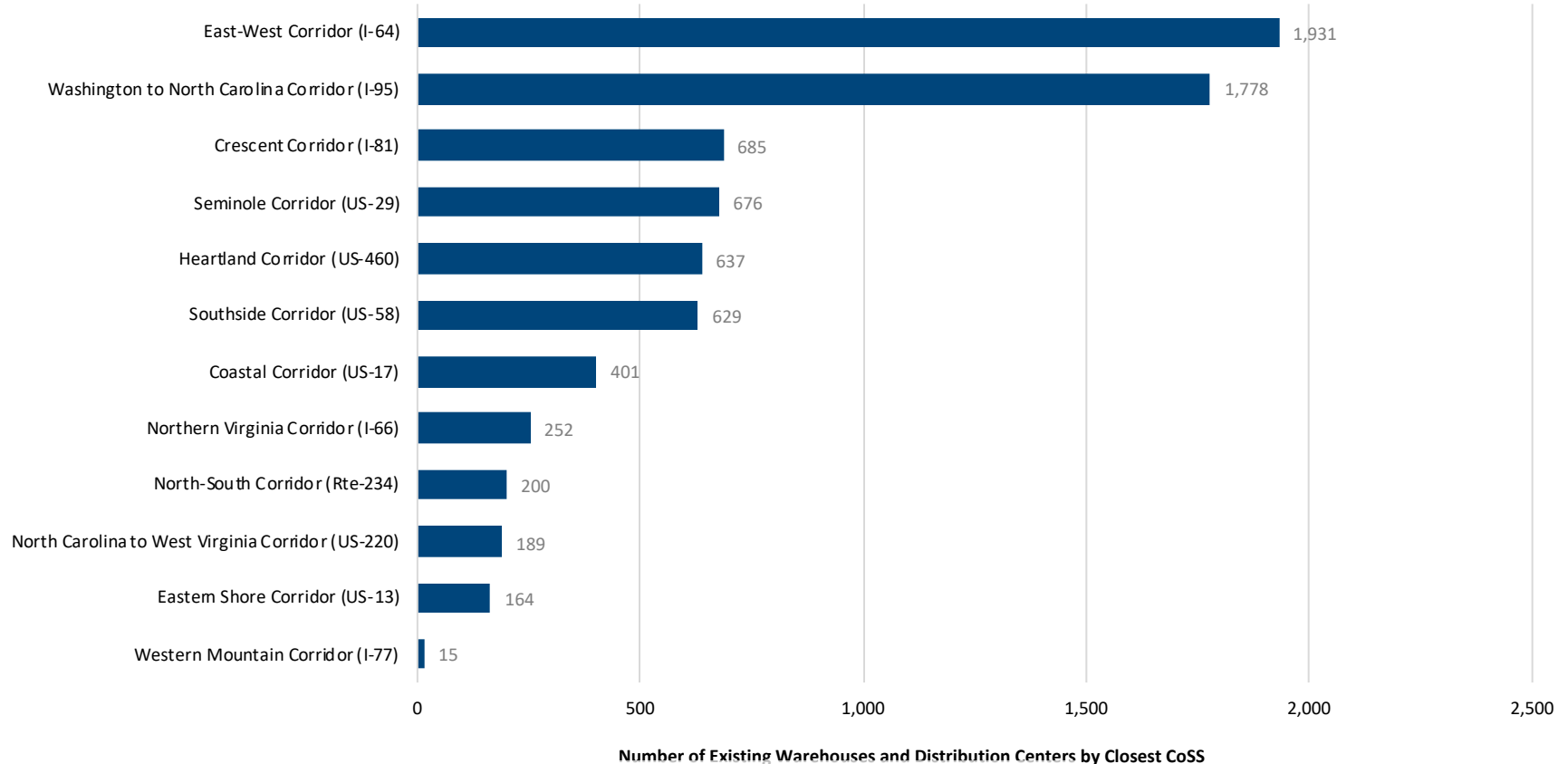
Heatmap of Existing Warehouse and Distribution Center Locations

Source: CoStar. Notes:

- For existing facilities only
- Summary by construction districts may reflect partial data



IDENTIFICATION OF FREIGHT ISSUES | STORAGE AND DISTRIBUTION – DISTANCE FROM CoSS



Number of Existing Warehouses and Distribution Centers by Closest CoSS

Source: CoStar. Notes:

- Summary by construction districts may reflect partial data

IDENTIFICATION OF FREIGHT ISSUES | TRUCK SAFETY - FREQUENCY

- **This map identifies locations with high frequencies of truck-involved crashes.**
- **Notes:**
 - "Truck-involved" conveys that a truck was involved, not necessarily at fault, in a crash.
 - The number of crashes involving trucks are relatively small so reliance on one measure may provide an incomplete/inaccurate picture.

Very High Need
High
Medium
Low



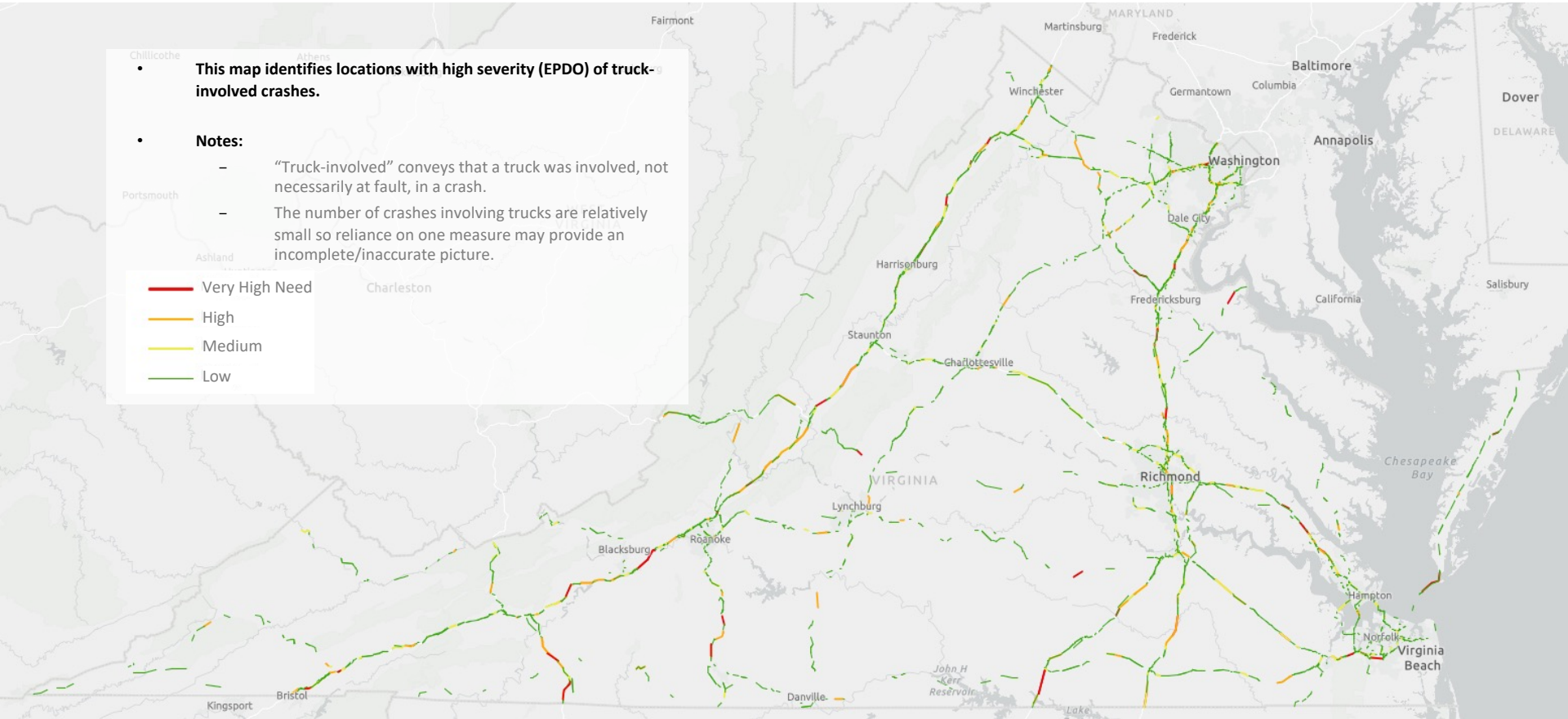
Note:

- This map shows major corridors defined as Corridors of Statewide Significance (CoSS).
- VTrans.org > InteractVTrans > MapExplorer > Layer "[Freight Performance Measures](#)"

IDENTIFICATION OF FREIGHT ISSUES | TRUCK SAFETY - SEVERITY

- **This map identifies locations with high severity (EPDO) of truck-involved crashes.**
- **Notes:**
 - "Truck-involved" conveys that a truck was involved, not necessarily at fault, in a crash.
 - The number of crashes involving trucks are relatively small so reliance on one measure may provide an incomplete/inaccurate picture.

Very High Need
High
Medium
Low



Note:

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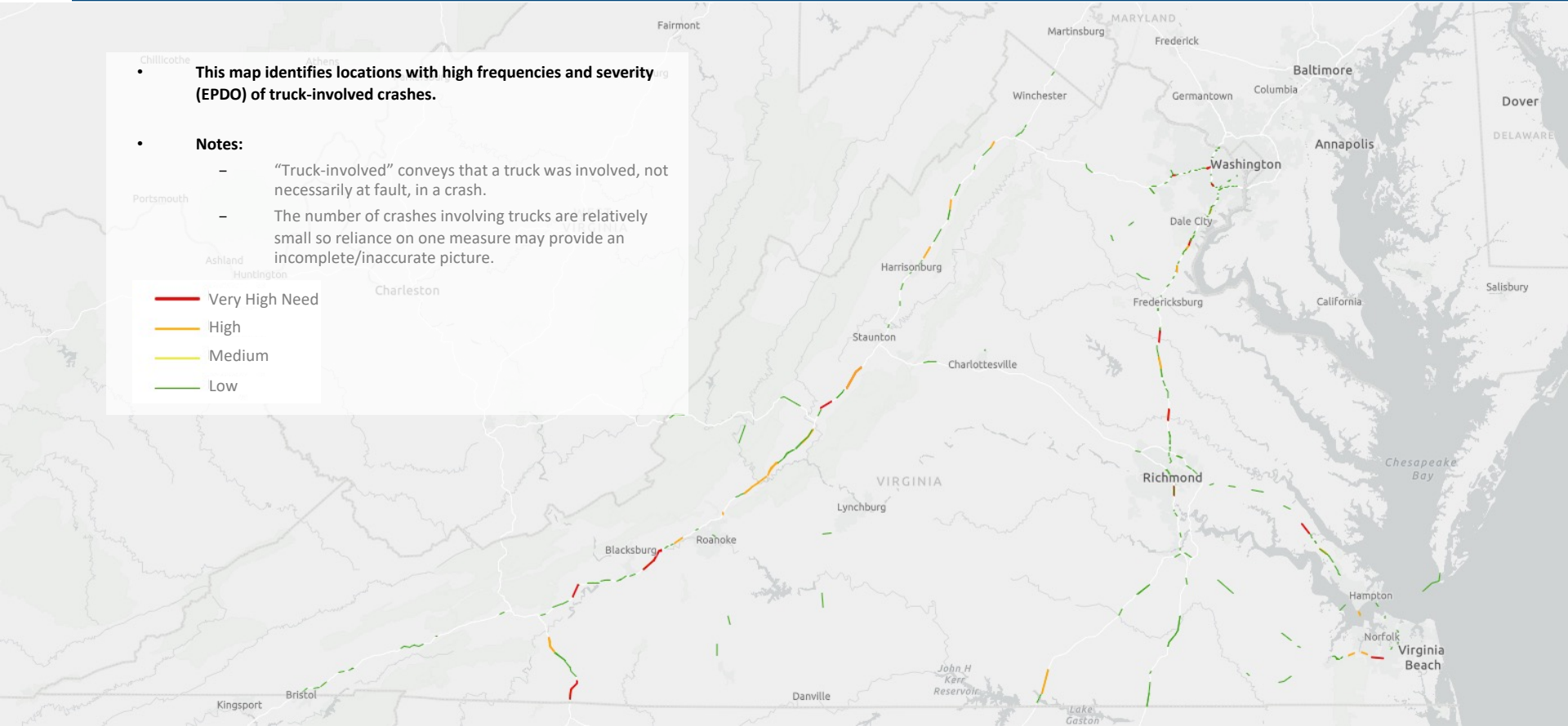
IDENTIFICATION OF FREIGHT ISSUES | TRUCK SAFETY INDEX (FREQUENCY + SEVERITY)

- This map identifies locations with high frequencies and severity (EPDO) of truck-involved crashes.

- **Notes:**

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- The number of crashes involving trucks are relatively small so reliance on one measure may provide an incomplete/inaccurate picture.

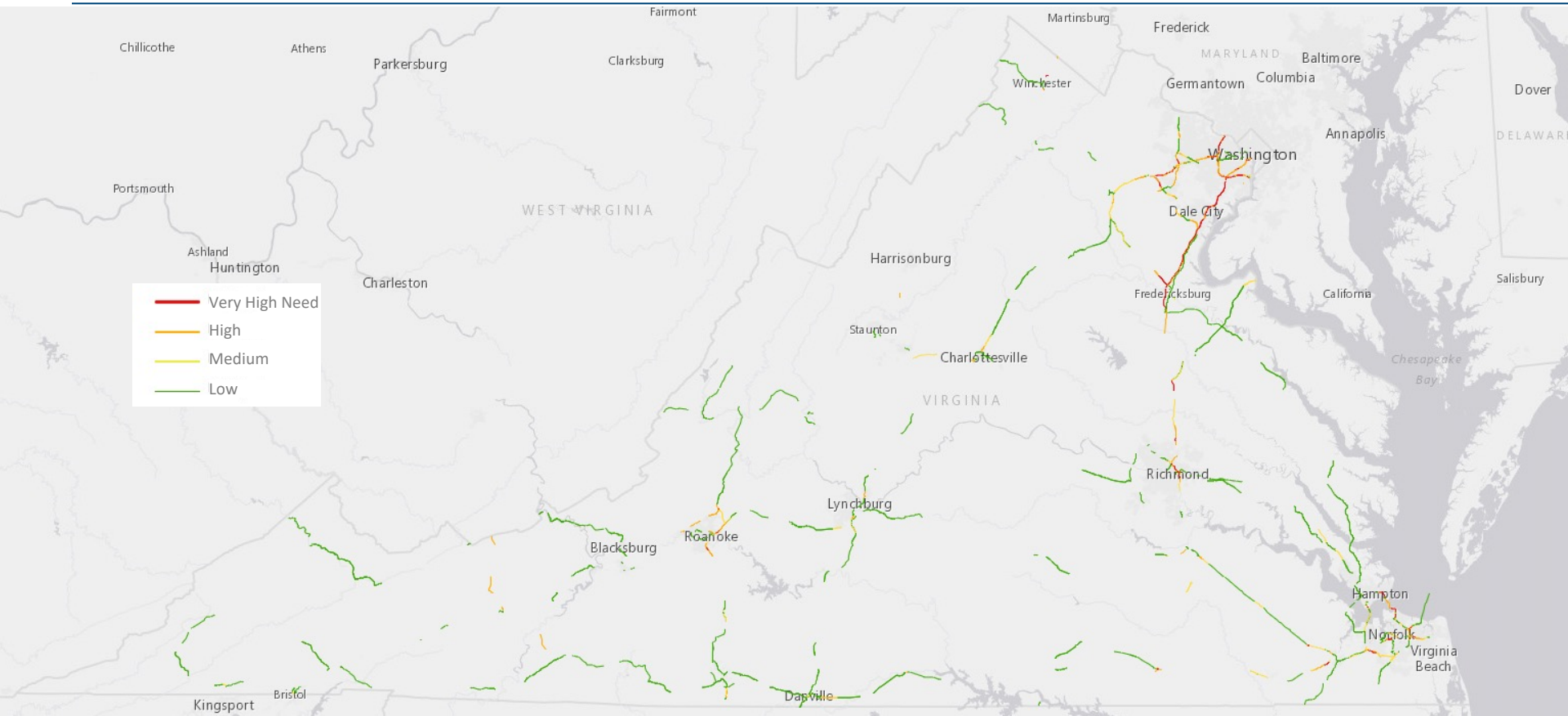
- Very High Need
- High
- Medium
- Low



Note:

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- VTrans.org > InteractVTrans > MapExplorer > Layer "[Freight Performance Measures](#)"

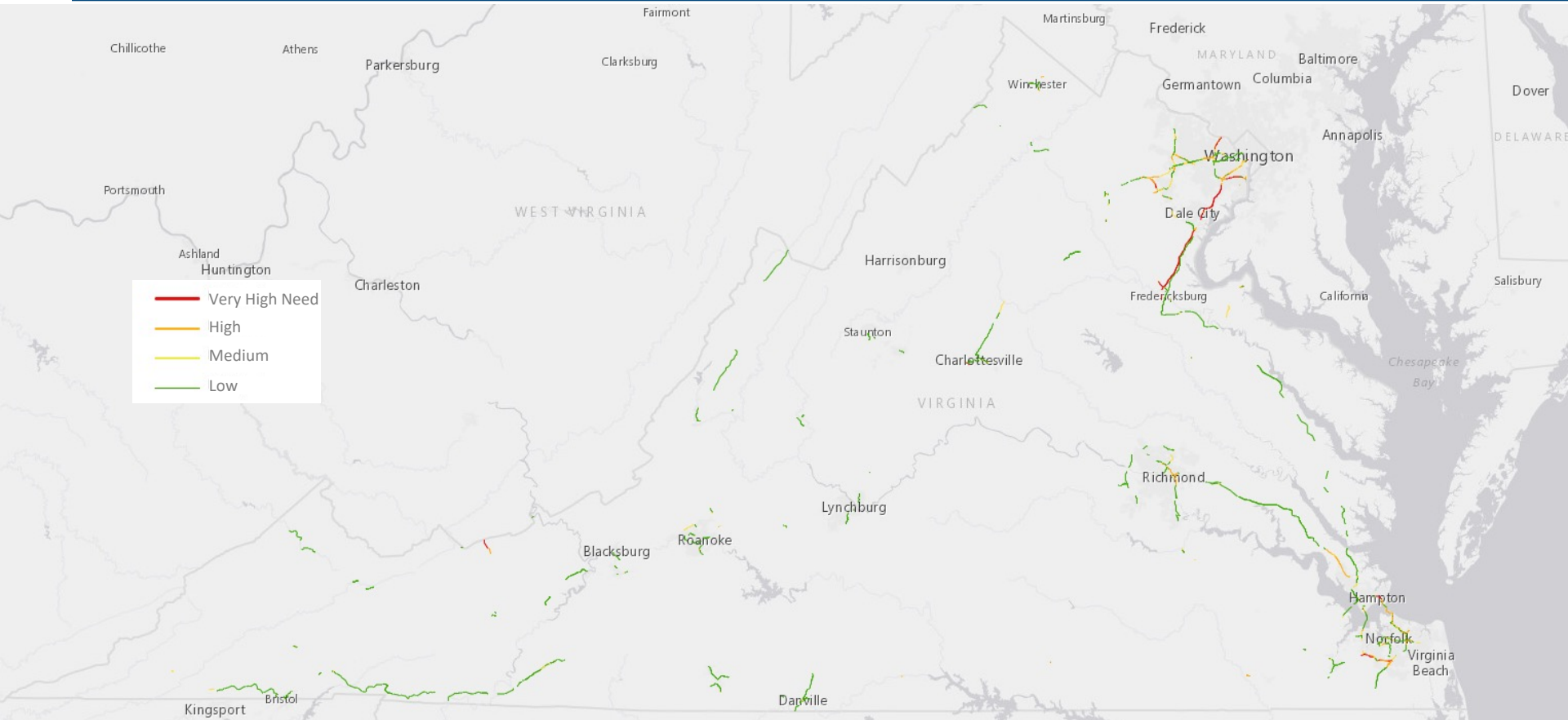
IDENTIFICATION OF FREIGHT ISSUES | TRUCK CONGESTION (CUMULATIVE TRUCK DELAY)



Note:

- This map shows major corridors defined as Corridors of Statewide Significance (CoSS).
- VTrans.org > InteractVTrans > MapExplorer > Layer "[Freight Performance Measures](#)"

IDENTIFICATION OF FREIGHT ISSUES | TRUCK (TRAVEL TIME) RELIABILITY

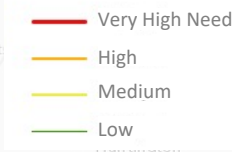


Note:

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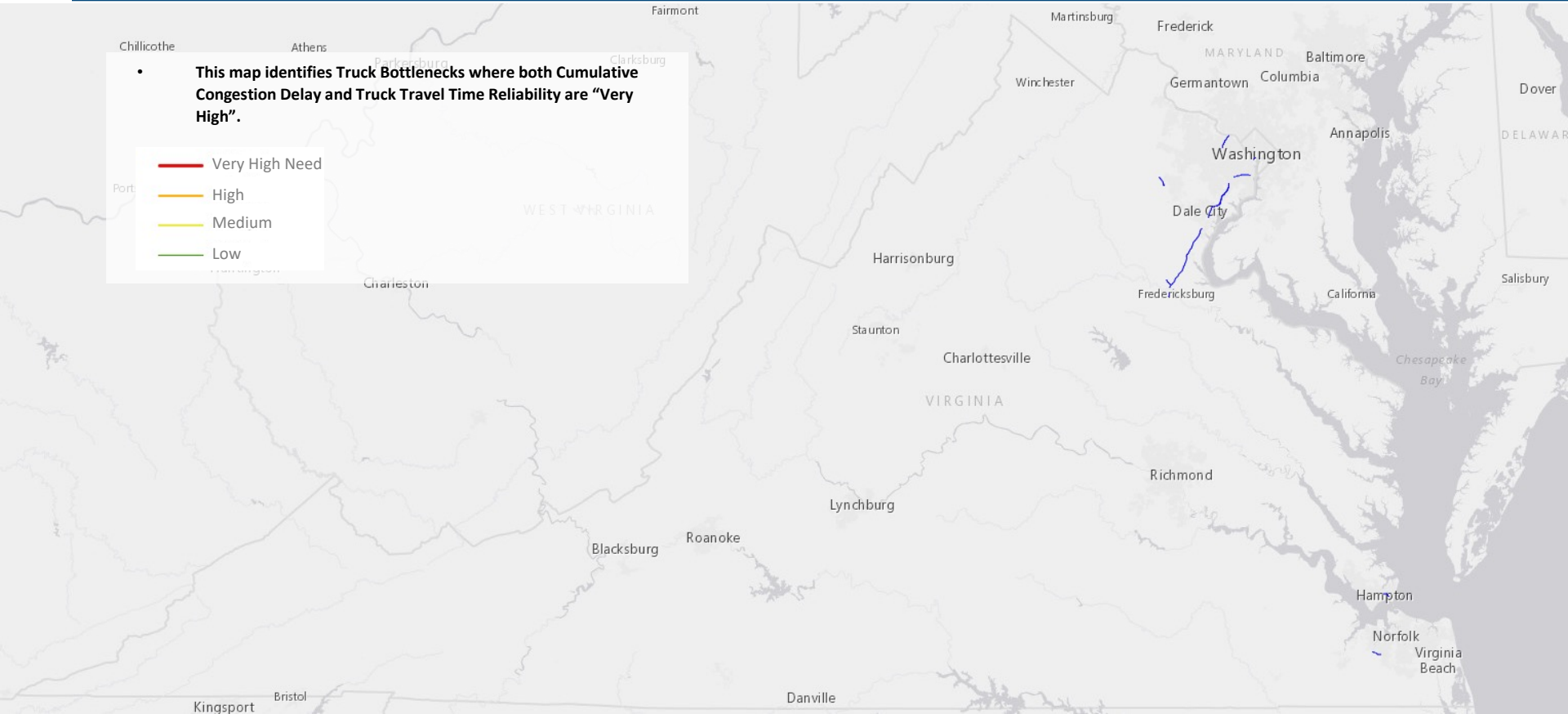
IDENTIFICATION OF FREIGHT ISSUES | TRUCK BOTTLENECKS (CONGESTION + RELIABILITY)

- **This map identifies Truck Bottlenecks where both Cumulative Congestion Delay and Truck Travel Time Reliability are “Very High”.**



The legend shows four levels of need for truck bottlenecks, represented by colored lines:

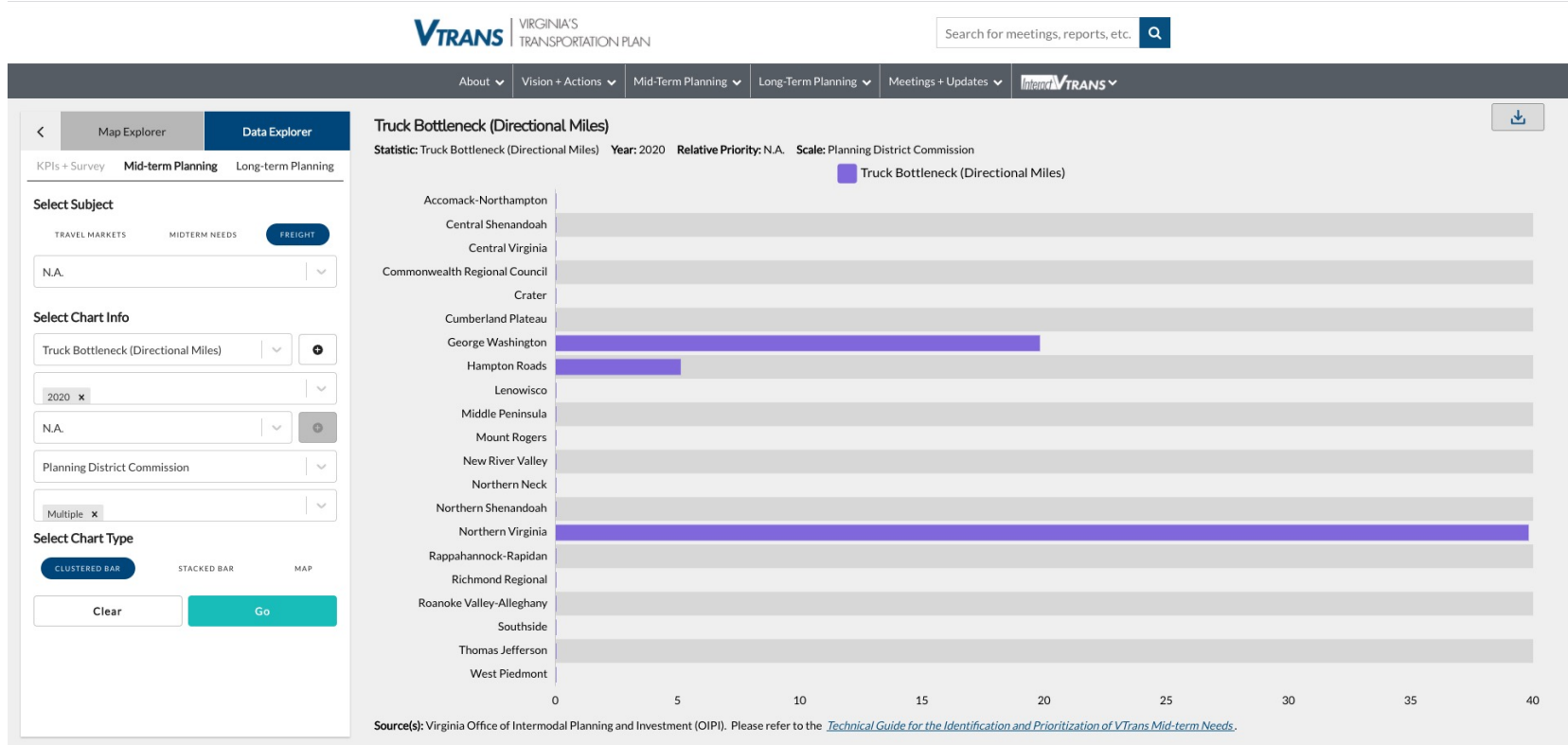
- Very High Need (Red line)
- High (Orange line)
- Medium (Yellow line)
- Low (Green line)



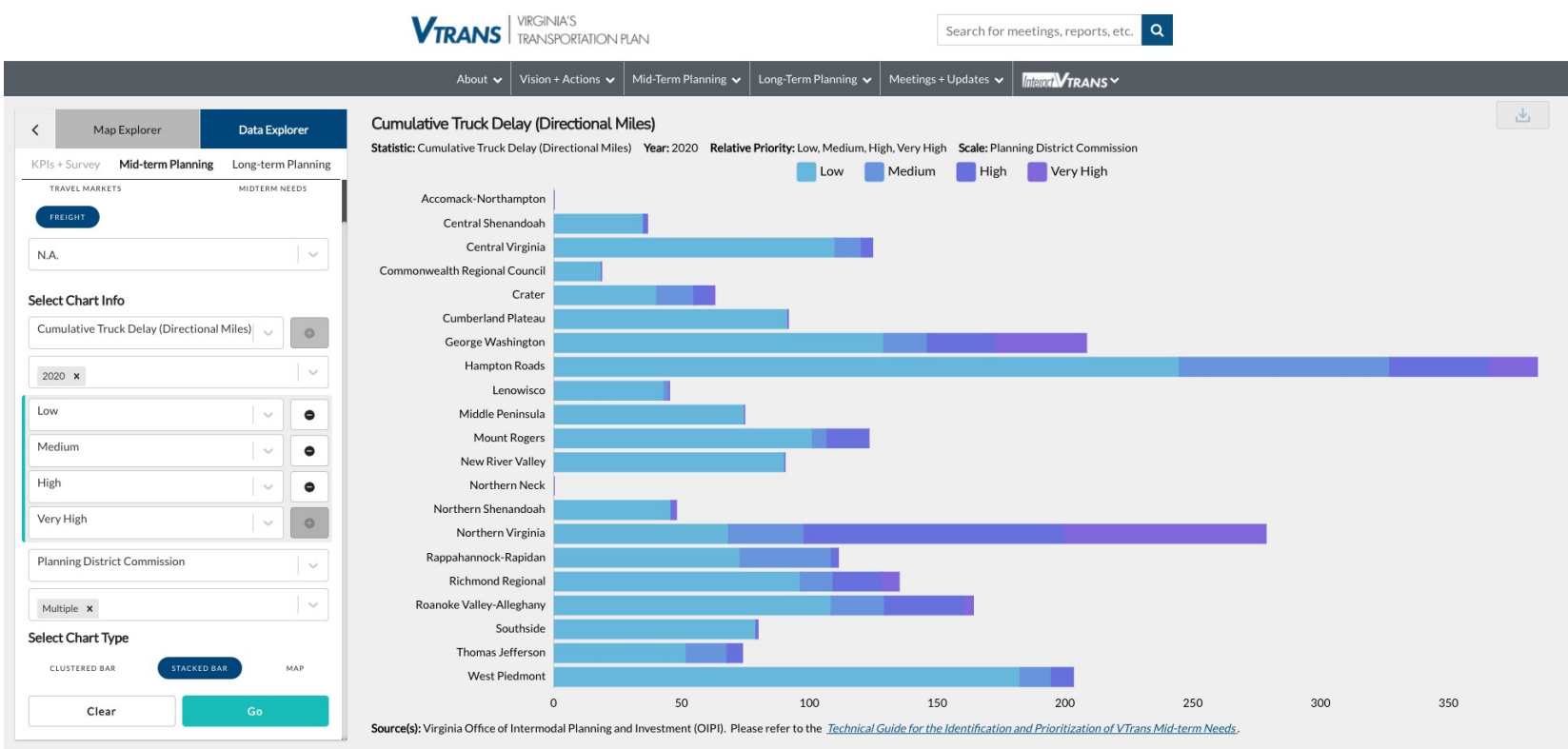
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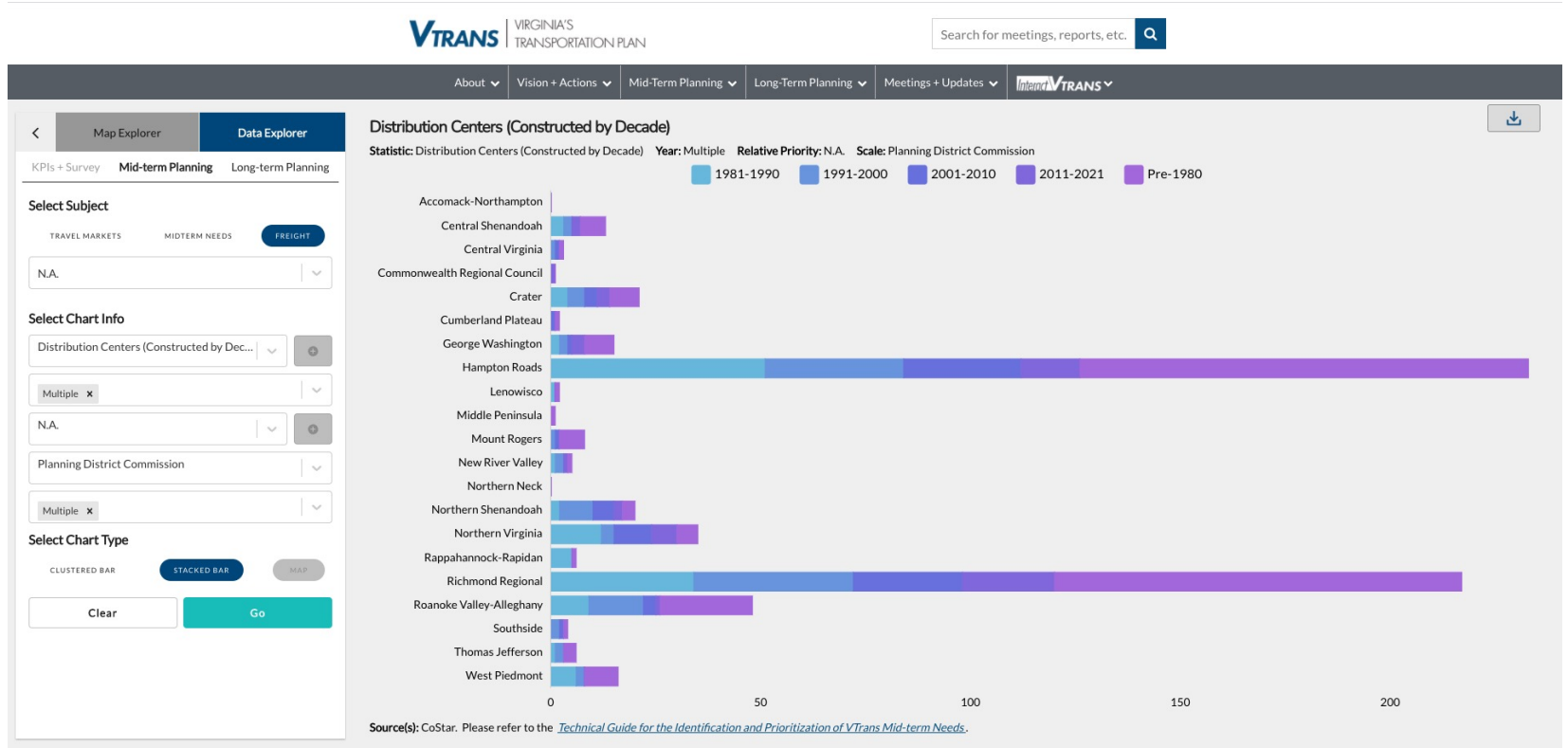
- Information is delivered in digital formats. Graphs and charts can be created.



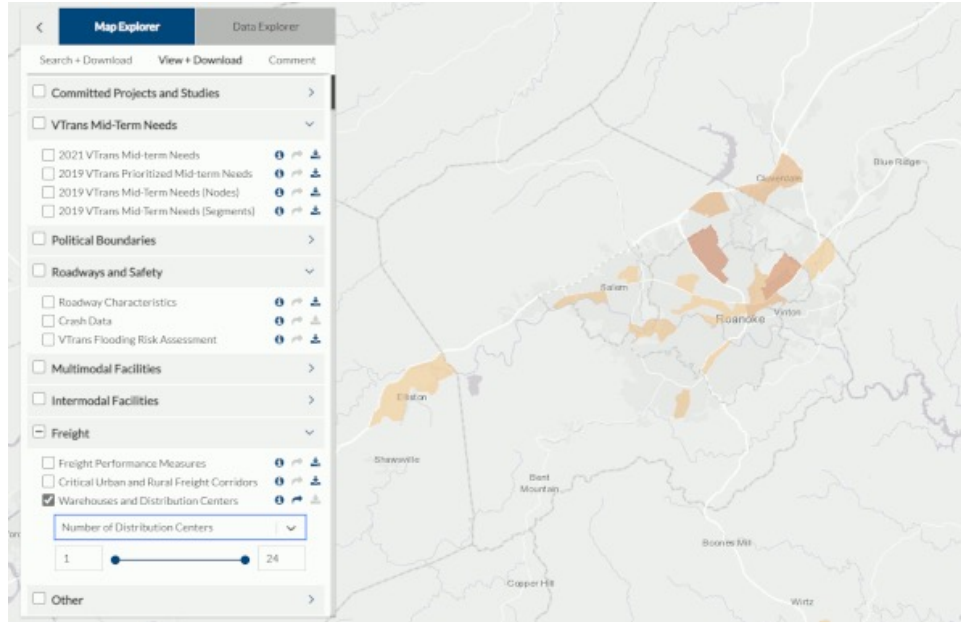
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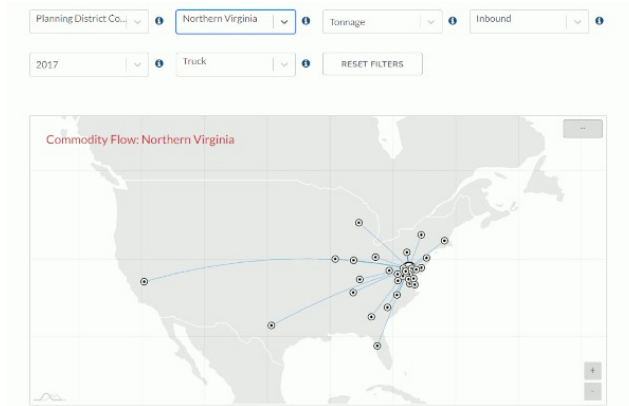
- Information is delivered in digital formats. Graphs and charts can be created.



VTrans.org > InteractVTrans > MapExplorer > Layer "[Freight Performance Measures](#)"

DELIVERY MECHANISM

- Information is delivered in digital formats. Graphs and charts can be created.



Select Criteria for:
State, Construction District, MPO
or PDC

**Origin and
destination**

Commodity Types



VTrans.org > Mid-term Planning > [Freight Element](#)

- **Evaluate potential modifications to the Policy for Identification and Prioritization of VTrans Mid-term Needs**