



COMMONWEALTH of VIRGINIA
Office of the
SECRETARY of TRANSPORTATION

VTRANS UPDATE

OIPI-VDOT-DRPT-MPO QUARTERLY COORDINATION MEETING

September 22, 2020



PURPOSE AND AGENDA

- Method to Prioritize VTrans Mid-term Needs
 - Context and Overview
 - Noteworthy Points
 - Process
 - Example



METHOD TO PRIORITIZE MID-TERM NEEDS | CONTEXT AND OVERVIEW

- VTrans Identifies Needs for Two Planning Horizons

	Mid-Term Needs	Long-Term Needs
Planning Horizon	<ul style="list-style-type: none">• 7 - 10 years	<ul style="list-style-type: none">• 10 – 25 years
Purpose	<ul style="list-style-type: none">• Screen SMART SCALE applications• Prioritize VDOT Revenue Sharing applications• <u>Forms the basis of VTrans Multimodal Project Study Pipeline</u>	<ul style="list-style-type: none">• Inform policy to prepare for gradual and systematic change
Board Action	<ul style="list-style-type: none">• Adopted in January 2020	<ul style="list-style-type: none">• Scheduled for fall of 2021

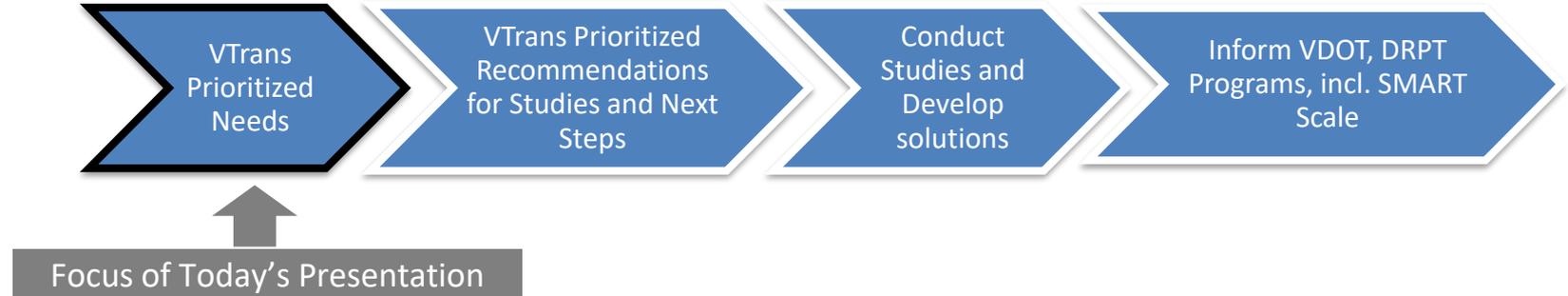
Focus of Today's Presentation

Ongoing, Please refer to the presentation at the [June MPO Quarterly Meeting](#)

METHOD TO PRIORITIZE MID-TERM NEEDS | CONTEXT AND OVERVIEW

- VTrans Multimodal Project Study Pipeline

- January 2020: Direction to prioritize the VTrans 2019 Mid-term Needs
- May 2020: Presentation: Approach for the Project Study Pipeline (Below)
- July 2020: Presentation: Approach for the Prioritization of the VTrans Mid-term Needs



- **Significance of the Prioritized VTrans Mid-term Needs**
 - If approved and directed by the CTB, the Prioritized Needs may guide VDOT and DRPT planning and project development decisions
 - The Prioritized Needs may also get utilized for other planning and programming purposes

METHOD TO PRIORITIZE MID-TERM NEEDS | CONTEXT AND OVERVIEW

- Outreach and Engagement: 13 presentations and information sharing sessions between August 6 and September 24
 - [Bristol MPO](#)
 - [Kingsport MTPO](#)
 - [New River Valley MPO TAC](#)
 - [Danville MPO](#)
 - [WinFred MPO TAC](#)
 - [Hampton Roads TPO TTAC](#)
 - [Harrisonburg-Rockingham MPO](#)
 - [Tri-Cities MPO TAC](#)
 - [Fredericksburg Area MPO TAC](#)
 - [Roanoke Valley TPO TAC](#)
 - [Charlottesville-Albermarle MPO TAC](#)
 - [Central Virginia MPO TAC](#)
 - [Staunton-Augusta Waynesboro MPO TAC](#)
 - [NVRTA RJACC](#)

METHOD TO PRIORITIZE MID-TERM NEEDS | CONTEXT AND OVERVIEW

- Presentations at the MPO Quarterly Meeting
 - [March 2020](#)
 - [June 2020](#)
 - September 2020 (today)

METHOD TO PRIORITIZE MID-TERM NEEDS | PROCESS

STEP 1

Define
Geographical
Levels of
Prioritization

Establish criteria for aggregating VTrans Need Categories:

- Statewide Priorities: Needs within the Corridors of Statewide Significance (CoSS) and **Safety** Travel Markets
- District Priorities: Needs within the Regional Networks (RN), Safety, and UDA (IEDA Access) Travel Markets

Prioritized
Needs

- Very high
- High
- Medium
- Low

STEP 2

Prioritize within
Needs Categories

Establish priorities within each VTrans Need Category by utilizing the following criteria:

- Severity of the Need
- Magnitude (e.g. number of users, vehicles, etc.)

STEP 3

Weigh and
Aggregate Needs
across Needs
Categories

Identify Statewide and District Priority locations by applying weights to VTrans Need categories

Prioritized
locations:

- Statewide
Priority 1 - 4
- District Priority
Location 1 - 4

STEP 4

Adjust Priorities
for Influencing
Factors

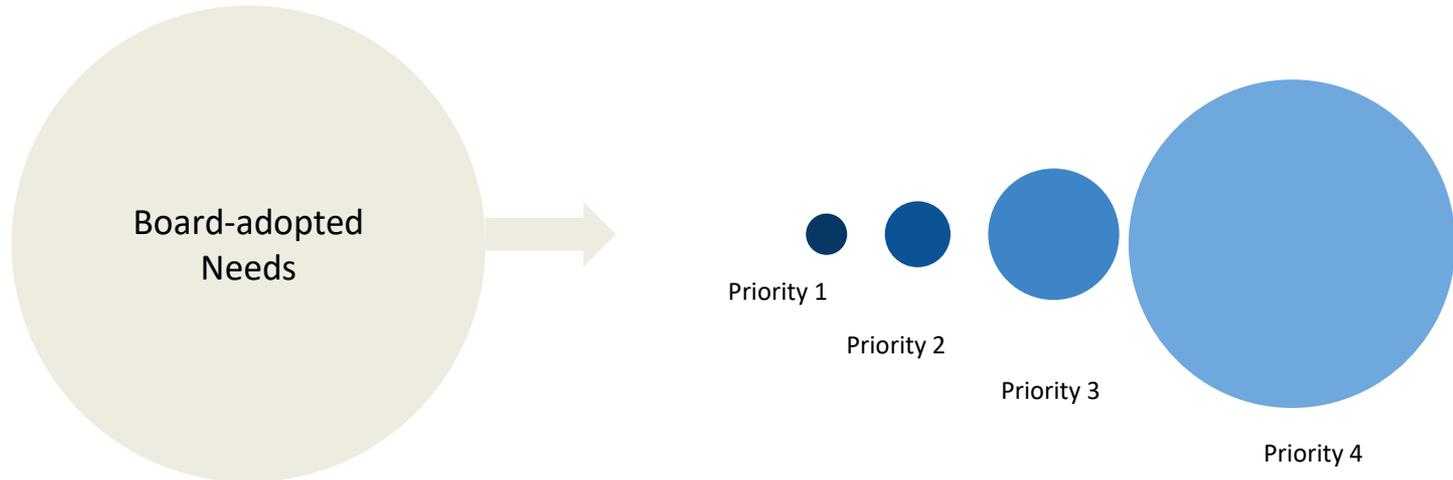
Adjust the Statewide and District Priority locations by considering the following influencing factors

- Co-located bridge and pavement repair, rehabilitation, or replacement needs
- Exposure to Sea-level Rise, Storm Surge and Inland/Riverine Flooding

METHOD TO PRIORITIZE NEEDS | NOTEWORTHY POINTS

1. What the Prioritization Does

- Allows one to focus on a manageable and methodically-selected subsection of the whole
- Prioritizes competing demands



METHOD TO PRIORITIZE NEEDS | NOTEWORTHY POINTS

2. Overall Approach

- Incorporates items gathered during the Lessons Learned Exercise completed after the completion of VTrans 2040
- A data-driven method to ensure a **transparent**, **quantifiable**, and **replicable** processes

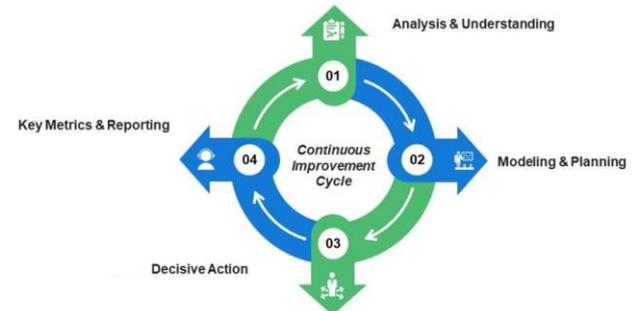
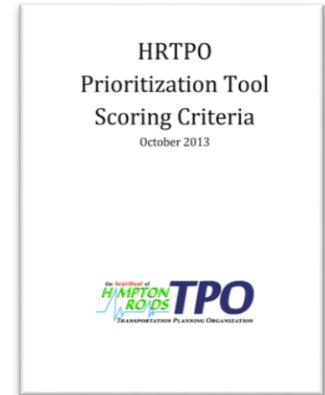
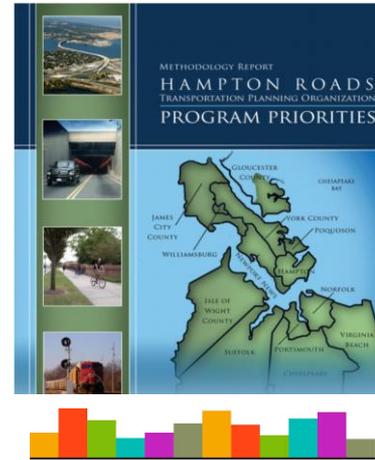


The image shows the Table of Contents for the VTrans Multimodal Transportation Plan - 2035 Needs Assessment. The document is published by the Commonwealth of Virginia, Office of Intermodal Planning and Investment, Office of the Secretary of Transportation. It was prepared by the Multimodal Working Group, with Cambridge Systematics, Inc. and Foursquare Integrated Transportation Planning. The Table of Contents lists the following sections and page numbers:

TABLE OF CONTENTS	
Introduction	3
VTrans2040 Vision, Guiding Principles and Goals	4
VHTP Needs Assessment Process	6
VHTP Needs Assessment Summary Map	7
Needs Assessment Approach	8
Consolidated Needs Tiering Results	11
How to Read Needs Assessment Pages	11
VHTP Tiered Consolidated Needs - Bristol District	14
VHTP Tiered Consolidated Needs - Culpeper District	16
VHTP Tiered Consolidated Needs - Fredericksburg District	18
VHTP Tiered Consolidated Needs - Hampton Roads District	20
VHTP Tiered Consolidated Needs - Lynchburg District	22
VHTP Tiered Consolidated Needs - Northern Virginia District	24
VHTP Tiered Consolidated Needs - Richmond District	26
VHTP Tiered Consolidated Needs - Salem District	28
VHTP Tiered Consolidated Needs - Staunton District	30
Next Steps - 2035 Recommendations	32
SMART SCALE	33
References	33

METHOD TO PRIORITIZE NEEDS | NOTEWORTHY POINTS

3. Process allows for Continuous Improvement
 - Reliance on - **VTrans Model for Identification and Prioritization of Mid-term Needs**
 - Products (manuals, design standards) and Processes require continuous improvements to stay relevant
 - It becomes progressively easier to learn and modify logic



METHOD TO PRIORITIZE NEEDS | NOTEWORTHY POINTS

4. Systematic and Transparent Method to Incorporate Feedback

- Gathering feedback and modifying methods is part of planning and methodology
 - Example: [Step # 4: Consider Stakeholder Input on Page 22 of the Richmond Needs Methodology Report.](#)
 - Please also refer to the [changes](#) based on the feedback received during the workshops.

Goal A: Methodology for Identification of Congestion Mitigation Needs (continued)

Steps	Input	Action	Output
3. Calculate measures.	Output from steps 1 and 2	<ul style="list-style-type: none"> Identify average speeds in each of the 14 hourly time periods per day that fall below the posted speed limit. Compare measured travel speeds to alternative percentages of the speed limit (the "threshold") for each weekday and weekend period and report the corresponding person miles of travel that occurred at speeds below the established threshold. Divide the amount of travel that exceeds the threshold by the total amount of person miles of travel for that time period. Report the ratio of excessively congested person miles of travel to total person miles of travel for weekdays and the weekend. (Thresholds are 60%, 75% and 90% of the posted speed limit.) 	<ul style="list-style-type: none"> Total average weekday person-miles of travel and percentage of total travel below 60%, 75%, and 90% of speed limit. Information was compiled and presented separately for weekdays and weekends. Information is stored in geographic information system (GIS) database.
4. Consider stakeholder input.	<ul style="list-style-type: none"> Support for 75% threshold Clarify criteria for selecting LAF Request to consider weekend travel, in addition to weekday travel 	<ul style="list-style-type: none"> Review results of alternative thresholds. Review location of other Select Limited Access Facilities relative to CoSS, Interstates and NHS. 	<ul style="list-style-type: none"> Adopted 75% threshold Weekdays and weekends included Updated LAF list to include more segments (used a logic that allowed shorter segments of less than 10 miles if they connected to another LAF)
5. Identify performance thresholds.	Output from steps 3 and 4	<ul style="list-style-type: none"> Calculate total person miles of travel below 75% of the posted speed limit into three weekday time periods: 6 a.m.-10 a.m., 10 a.m.-4 p.m., and 4 p.m.-8 p.m. Select the one of the three weekday time periods with the highest percentage of person miles traveled in excessively congested conditions (Output X). Perform the same calculations for weekends, using a single 6 a.m. - 8 p.m. period (Output Y). Identify share of person miles traveled that occurs in excessively congested condition by performing the following: (Output X x 5 weekdays) + (Output Y x 2 weekend days) / 7 days. 	<ul style="list-style-type: none"> Threshold - Average share of person miles traveled that occurs in excessively congested conditions be at least 2% or higher.



METHOD TO PRIORITIZE MID-TERM NEEDS | PROCESS

STEP 1

Define
Geographical
Levels of
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Establish criteria for aggregating VTrans Need Categories:

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- District Priorities: Needs within the Regional Networks (RN), Safety, and UDA (IEDA Access) Travel Markets

Prioritized
Needs

- Very high
- High
- Medium
- Low

STEP 2

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Needs Categories

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Identify Statewide and District Priority locations by applying weights to VTrans Need categories

Prioritized
locations:

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Priority 1 - 4
- District Priority
Location 1 - 4

STEP 4

Adjust Priorities
for Influencing
Factors

Adjust the Statewide and District Priority locations by considering the following influencing factors

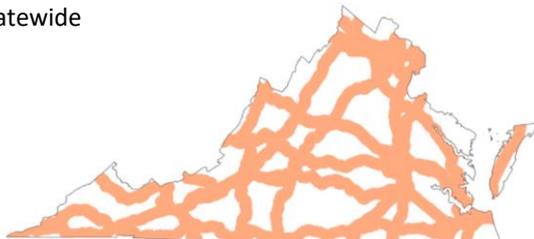
- Co-located bridge and pavement repair, rehabilitation, or replacement needs
- Exposure to Sea-level Rise, Storm Surge and Inland/Riverine Flooding

METHOD TO PRIORITIZE NEEDS | STEP 1

Levels of Prioritization Statewide Priority Locations

Aggregation Level

Statewide



District Priority Locations

VDOT Construction District



Applicable VTrans Travel Market(s)

- Corridors of Statewide Significance (CoSS)
- Safety Needs along CoSS

- Regional Networks (RN)
- Safety
- Urban Development Area (UDA) Need - Access to Industrial and Economic Development Areas (IEDA)

Applicable Need Categories

1. Congestion Mitigation (CoSS)
2. Improved Reliability (CoSS)
3. Rail on Time Performance (CoSS)
4. Capacity Preservation (CoSS)
5. TDM (CoSS)
6. Safety (Segments and Intersections) along CoSS

1. Congestion Mitigation (RN)
2. Improved Reliability (RN)
3. Transit Access to EEAs (RN)
4. Transit Access to ACs (RN)
5. Bicycle Access to ACs (RN)
6. Pedestrian Access to ACs (RN)
7. Capacity Preservation (RN)
8. Safety (Segments and Intersections)
9. Safety (Pedestrian Safety)
10. TDM (RN)
11. Access to IEDA (UDA)

METHOD TO PRIORITIZE NEEDS | EXAMPLE

Road Name	Length (Mile)
Hummingbird Dr	1
Cardinal St	2
Robin Blvd	2
Cardinal St	7
Robin Blvd	5
Hummingbird Dr	3
Hawk Ave	9
Robin Blvd	5
Robin Blvd	2
Cardinal St	7
Swan St	2
Cardinal St	6
Woodpecker Dr	8
Hummingbird Dr	1
Bird St	4
Duck Blvd	3
Geese Ave	9
Swan St	6
Fly Square	7
Swan St	3
Cardinal St	8
Total Mileage to	100

Total 100 Miles of
Corridors of Statewide
Significance

METHOD TO PRIORITIZE NEEDS | EXAMPLE: STEP 1

		STEP 1					
Road Name	Length (Mile)	Congestion Priority	Reliability Priority	Rail Reliability Priority	Capacity Preservation Priority	TDM Priority	Safety Priority
Hummingbird Dr	1						
Cardinal St	2						
Robin Blvd	2						
Cardinal St	7						
Robin Blvd	5						
Hummingbird Dr	3						
Hawk Ave	9						
Robin Blvd	5						
Robin Blvd	2						
Cardinal St	7						
Swan St	2						
Cardinal St	6						
Woodpecker Dr	8						
Hummingbird Dr	1						
Bird St	4						
Duck Blvd	3						
Geese Ave	9						
Swan St	6						
Fly Square	7						
Swan St	3						
Cardinal St	8						
Total Mileage to	100						

STEP 1: Utilize CoSS and Safety Need Categories for Statewide Prioritization

METHOD TO PRIORITIZE NEEDS | EXAMPLE: STEP 2

		STEP 2					
Road Name	Length (Mile)	Congestion Priority	Reliability Priority	Rail Reliability Priority	Capacity Preservation Priority	TDM Priority	Safety Priority
Hummingbird Dr	1	5	3	4	4	7	6
Cardinal St	2	7	1	4		5	4
Robin Blvd	2		1	3	3	3	7
Cardinal St	7	6		2	6	6	1
Robin Blvd	5		7		6	6	1
Hummingbird Dr	3	5			7	2	
Hawk Ave	9		7		3		2
Robin Blvd	5	7	1	2		7	
Robin Blvd	2	6		7	1		1
Cardinal St	7		3	2	4		2
Swan St	2				4	1	4
Cardinal St	6	6	2	2	1		
Woodpecker Dr	8	6			3	1	
Hummingbird Dr	1	7				2	
Bird St	4				4	1	4
Duck Blvd	3	6	2	2	1		
Geese Ave	9	6			3	1	
Swan St	6	7				2	
Fly Square	7						
Swan St	3				3		4
Cardinal St	8	5	1	1	2		
Total Mileage to	100						

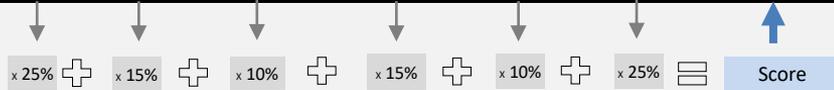
STEP 2: For each need category: **Severity x Magnitude = Score**

Score Use to Establish Priorities Within Each Category

- Top 0 – 5% of the total mileage = 7 or Very High
- 5 – 15% of the total mileage = 5, 6 or High
- 15 – 25% of the total mileage = 3, 4 or Medium
- Bottom 25 – 100% of the total mileage = 1, 2 or Low

METHOD TO PRIORITIZE NEEDS | EXAMPLE: STEP 3

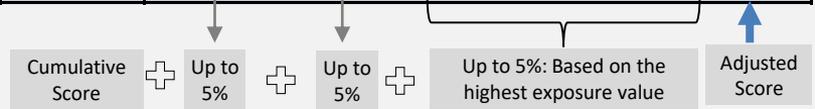
Road Name	Length (Mile)	STEP 2						STEP 3
		Congestion Priority	Reliability Priority	Rail Reliability Priority	Capacity Preservation Priority	TDM Priority	Safety Priority	Cumulative Score
Hummingbird Dr	1	5	3	4	4	7	6	4.9
Cardinal St	2	7	1	4		5	4	3.5
Robin Blvd	2		1	3	3	3	7	3.2
Cardinal St	7	6		2	6	6	1	3.1
Robin Blvd	5		7		6	6	1	3.2
Hummingbird Dr	3	5			7	2		2.3
Hawk Ave	9		7		3		2	2.5
Robin Blvd	5	7	1	2		7		2.4
Robin Blvd	2	6		7	1		1	2.0
Cardinal St	7		3	2	4		2	1.9
Swan St	2				4	1	4	1.9
Cardinal St	6	6	2	2	1			1.9
Woodpecker Dr	8	6			3	1		1.8
Hummingbird Dr	1	7				2		1.6
Bird St	4				4	1	4	1.9
Duck Blvd	3	6	2	2	1			1.9
Geese Ave	9	6			3	1		1.8
Swan St	6	7				2		1.6
Fly Square	7							
Swan St	3				3		4	1.7
Cardinal St	8	5	1	1	2			1.6
Total Mileage to	100							



STEP 3: Apply weighing to calculate cumulative scores.

METHOD TO PRIORITIZE NEEDS | EXAMPLE: STEP 4

Road Name	Length (Mile)	STEP 2						STEP 3 Cumulative Score	STEP 4					Adjusted Score Commonwealth Priority
		Congestion Priority	Reliability Priority	Rail Reliability Priority	Capacity Preservation Priority	TDM Priority	Safety Priority		Pavement Need	Bridge Need	Sea Level Rise	Storm Surge	Inland Flooding	
Hummingbird Dr	1	5	3	4	4	7	6	4.9						4.9
Cardinal St	2	7	1	4		5	4	3.5	0.12	0.12			0.07	3.8
Robin Blvd	2		1	3	3	3	7	3.2			0.06			3.3
Cardinal St	7	6		2	6	6	1	3.1					0.16	3.3
Robin Blvd	5		7		6	6	1	3.2						3.2
Hummingbird Dr	3	5			7	2		2.3	0.05	0.08			0.11	2.5
Hawk Ave	9		7		3		2	2.5						2.5
Robin Blvd	5	7	1	2		7		2.4						2.4
Robin Blvd	2	6		7	1		1	2.0						2.0
Cardinal St	7		3	2	4		2	1.9	0.04	0.02				2.0
Swan St	2				4	1	4	1.9		0.04				1.9
Cardinal St	6	6	2	2	1			1.9					0.05	1.9
Woodpecker Dr	8	6			3	1		1.8	0.06	0.09				1.9
Hummingbird Dr	1	7				2		1.6	0.06					1.7
Bird St	4				4	1	4	1.9		0.04				1.9
Duck Blvd	3	6	2	2	1			1.9					0.05	1.9
Geese Ave	9	6			3	1		1.8	0.06	0.09				1.9
Swan St	6	7				2		1.6	0.06					1.7
Fly Square	7													
Swan St	3				3		4	1.7						1.7
Cardinal St	8	5	1	1	2			1.6						1.6
Total Mileage to	100													



STEP 4: If Congestion or Reliability Needs are present, adjust **Cumulative Scores** for:

- **Pavement Needs:** Add up to 5% of the cumulative score from Step 3
- **Bridge Needs:** Add up to 5% of the cumulative score from Step 3
- **Exposure to Sea-level Rise, Storm Surge, or Flooding:** Add up to 5% of the cumulative score from Step 3

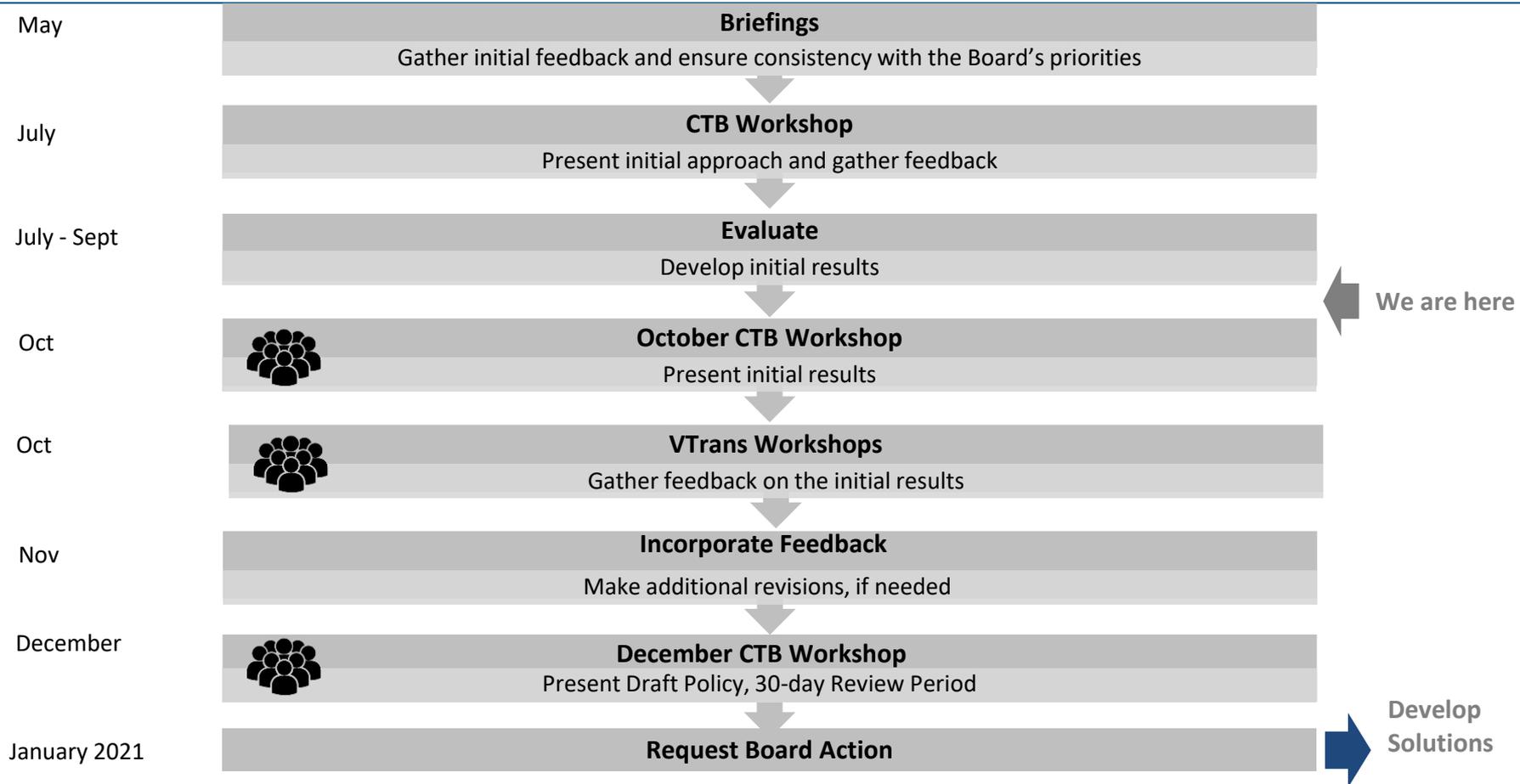
METHOD TO PRIORITIZE NEEDS | EXAMPLE: STEP 4

Road Name	Length (Mile)	STEP 2						STEP 3	STEP 4					Commonwealth Priority Locations	
		Congestion Priority	Reliability Priority	Rail Reliability Priority	Capacity Preservation Priority	TDM Priority	Safety Priority	Cumulative Score	Pavement Need	Bridge Need	Sea Level Rise	Storm Surge	Inland Flooding		Adjusted Score - Commonwealth Priority
Hummingbird Dr	1	5	3	4	4	7	6	4.9					4.9	Priority 1	
Cardinal St	2	7	1	4		5	4	3.5	0.12	0.12			0.07	3.8	Priority 2
Robin Blvd	2		1	3	3	3	7	3.2				0.06		3.3	Priority 2
Cardinal St	7	6		2	6	6	1	3.1					0.16	3.3	Priority 3
Robin Blvd	5		7		6	6	1	3.2						3.2	Priority 3
Hummingbird Dr	3	5			7	2		2.3	0.05	0.08			0.11	2.5	Priority 3
Hawk Ave	9		7		3		2	2.5						2.5	Priority 4
Robin Blvd	5	7	1	2		7		2.4						2.4	Priority 4
Robin Blvd	2	6		7	1		1	2.0						2.0	Priority 4
Cardinal St	7		3	2	4		2	1.9	0.04	0.02				2.0	Priority 4
Swan St	2				4	1	4	1.9		0.04				1.9	Priority 4
Cardinal St	6	6	2	2	1			1.9				0.05		1.9	Priority 4
Woodpecker Dr	8	6			3	1		1.8	0.06	0.09				1.9	Priority 4
Hummingbird Dr	1	7				2		1.6	0.06					1.7	Priority 4
Bird St	4				4	1	4	1.9		0.04				1.9	Priority 4
Duck Blvd	3	6	2	2	1			1.9				0.05		1.9	Priority 4
Geese Ave	9	6			3	1		1.8	0.06	0.09				1.9	Priority 4
Swan St	6	7				2		1.6	0.06					1.7	Priority 4
Fly Square	7														Priority 4
Swan St	3				3		4	1.7						1.7	Priority 4
Cardinal St	8	5	1	1	2			1.6						1.6	Priority 4
Total Mileage to	100														

Using the Adjusted Score, Assign Priority to a Segment/Location

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

METHOD TO PRIORITIZE MID-TERM NEEDS | NEXT STEPS



Please share questions or concerns with the VTrans Team

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Questions / Comments?