



COMMONWEALTH of VIRGINIA  
*Office of the*  
SECRETARY of TRANSPORTATION

**SMART SCALE**  
Round 5 Proposed Changes Webinar

November 22, 2021

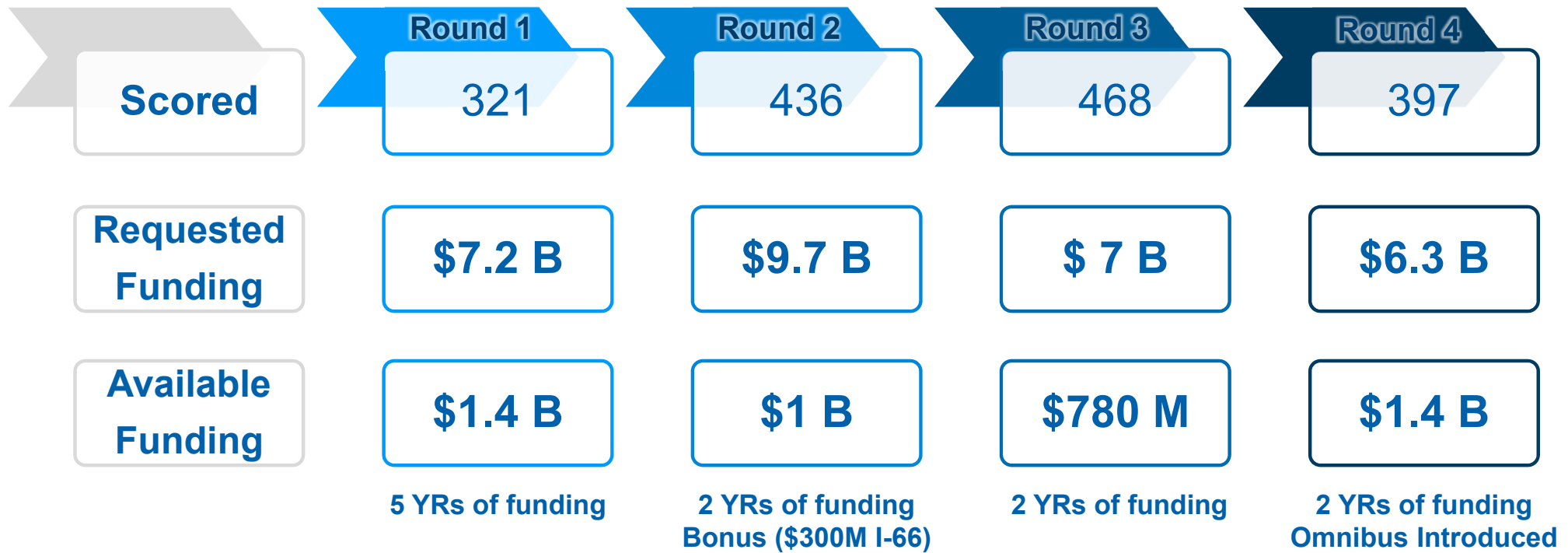


# Overview

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- **Round 4 Feedback**
- **Round 5 Changes proposed to CTB in October**
  - [https://www.ctb.virginia.gov/resources/2021/oct/pres/10\\_smartscale\\_round\\_5.pdf](https://www.ctb.virginia.gov/resources/2021/oct/pres/10_smartscale_round_5.pdf)
- **SMART Portal Pre-Scoping Module**
- **Next Steps**

# Round Review



## Round 4 Feedback

- **Users had generally favorable responses to Portal changes introduced in Round 4 – the Conditional Screen In on the Pre-Application and the States Understanding of Project Scope (SUPS), but room for improvement:**
  - Conditional Screen In: Provide more actionable feedback and keep the results visible on the Full Application.
  - SUPS: Portal functionality needed improvement, the State should provide feedback earlier in the process, and the drafting process needs to be made clearer to applicants.
- **Applicants faced similar organizational challenges as in the past, the top three being:**
  - Availability of staff or financial resources (34 percent).
  - Screening and Validation process (25 percent).
  - Understanding the application process (20 percent).

# Round 4 Observations to Round 5 Proposed Changes

## Round 4 Observations/Requests

- **Environmental Quality Measures**

- **E.1 (Air Quality)**

- Can it be improved or benefits better quantified?

- **E.2 (Impact to Natural and Cultural Resources)**

- Is it appropriate to apply a ¼ mile buffer to all project types?

- **Land Use Measure**

- Should other Area Types be considered for Land Use?

- **Cost Estimates**

- Requests to improve transparency and consistency

# Current E.1 (Air Quality) - Overview

Potential of project to improve air quality and reduce greenhouse gas (GHG) emissions

Non-SOV Project Characteristics	Points
Rail Factor - Project includes improvements to rail transit or passenger rail facilities.	3
Bicycle Factor - Project includes construction or replacement of bike facilities	2
Pedestrian Factor - Project includes construction or replacement of pedestrian facilities	2
Park and Ride Factor - Project includes improvements to an existing or proposed park-and-ride lot	2
Bus Factor - Project includes bus facility improvements or reduces delay with scheduled peak service of 1 transit vehicle per hour	1
Special Accommodations Factor - Project include special accommodations (space/infrastructure) for hybrid or electric vehicles	0.5
Energy Efficient Factor - Project includes energy efficient infrastructure or fleets	0.5
<b>Total Points Possible 8.5 points maximum*</b>	
<b>Measure Scaling: *Points are multiplied by the increased number of peak period non-SOV users</b>	



Freight Transportation Project Characteristics	Points
Project reduces traffic delay with a high percentage of truck traffic (greater than 8 % of AADT)	1
Project includes improvements to freight rail network or intermodal facilities/ports/terminals	0.5
<b>Total Points Possible 1.5 points maximum**</b>	
<b>Measure Scaling: **Points are multiplied by peak period truck volumes</b>	

## Example - Lafayette Boulevard Multimodal Improvements

Factor	In App?	Supporting Information	Current E.1 - Increase in Non-SOV			Proposed - Increase in Non-SOV by Mode		
			Points	Increased Users	Measure	Points	Increased Users	Measure
Rail	X		3			3		
Bike	✓	Route 208 PNR lot - 10 bicycle lockers and 10 covered bicycle parking spaces	2	X	59 = 118.0	2	X	0 = 0.0
Pedestrian	✓	2000 ft sidewalk on the eastside of Lafayette Blvd (Sheetz to Family Dollar)	2	X	59 = 118.0	2	X	22 = 44.0
Park and Ride	✓	Route 208 PnR Lot - Add Transit Stations, Lighting, Bicycle Lockers/Parking	2	X	59 = 118.0	2	X	5 = 10.0
Bus	✓	VRE Feeder Service and Bus Stop Improvements	1	X	59 = 59.0	1	X	31 = 31.0
Special Accommodations EV	X		0.5			<i>Proposed Removal</i>		
Energy Efficient	✓	New transit Shelter at the Route 208 PNR lot will include LED solar lighting	0.5	X	59 = 29.5	0.5	X	31 = 15.5
Increase in Non-SOV User Points			Sum = 442.5			Sum = 100.5		
Non-SOV Normalized Measure						<i>(divide by maximum score in cohort and multiply by 100)</i> 8.7		

Factor	In App?	Supporting Information	Current E.1 - Freight			Proposed - Freight Scaled by Delay		
			Points	Trucks	Measure	Points	Trucks	Measure
Intermodal / Freight Rail	X		0.5					
Reduces Delay with High Truck	✓	13% Trucks (3515 Peak Period Volume)	1	x	3515 = 3515			
Points based on Delay Reduction								
0 < Delay Reduction < 2 = 0.5 point	✓	5.88 Person-Hours of Delay Reduced (From C.2 Score)				1	X	3515 = 3515.0
2 <= Delay Reduction < 100 = 1 point								
Delay Reduction >= 100 = 2 points								
Freight Delay Reduction Points			1		3515	1		3515
Freight Delay Reduction Normalized Measure						<i>(divide by maximum score in cohort and multiply by 100)</i> 100.0		
Total Measure = 3957.5						Weight Each 50% = 54.4		

# Results Summary

This method amounts to a refinement that better captures Non-SOV and Truck Delay Impacts.

Current and proposed measures should not be compared directly, as they are not on the same magnitude. Example project does not change rank.

Current E.1 - Increase in Non-SOV				Proposed - Increase in Non-SOV by Mode			
Points	Increased Users	Measure		Points	Increased Users	Measure	
3				3			
2	X 59	=	118.0	2	X 0	=	0.0
2	X 59	=	118.0	2	X 22	=	44.0
2	X 59	=	118.0	2	X 5	=	10.0
1	X 59	=	59.0	1	X 31	=	31.0
0.5				<i>Proposed Removal</i>			
0.5	X 59	=	29.5	0.5	X 31	=	15.5
Sum = 442.5				Sum = 100.5			
				<i>(divide by maximum score in cohort and multiply by 100)</i>			
				8.7			
Current E.1 - Freight				Proposed - Freight Scaled by Delay			
Points	Trucks	Measure		Points	Trucks	Measure	
0.5							
1	x 3515	=	3515				
				1	X 3515	=	3515.0
1		3515		1		3515	
				<i>(divide by maximum score in cohort and multiply by 100)</i>			
				100.0			
<b>Total Measure = 3957.5</b>				<b>Weight Each 50% = 54.4</b>			



# Proposed Quantitative Calculate CO<sub>2</sub> Offset

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## Use existing collected data for High Level Analysis

- Increase in non-SOV users - *currently calculated for E.1*
- Hours of delay reduced - *currently calculated for C.2*
- Trip Length - national averages, and SS analysis segment length (C.1/C.2)
- Emissions factors - *average passenger car fuel efficiency*
- Fuel use factor - *from delay reduced (gallon/hour)*

## Two Parts

**Non-SOV CO<sub>2</sub> Offset + Reduced Truck Delay CO<sub>2</sub> Offset**

# Proposed Quantitative Non-SOV CO<sub>2</sub> Offset

## 1. Increased Non-SOV VMT

- **Transit and Park & Ride Users** - multiply new users by the analysis trip length
- **Pedestrians** - multiply total new users by 0.67 miles\*
- **Bicyclists** - multiply total new users by 3.54 miles\*

\*Average Person Trip Length

## 2. Increased Non-SOV VMT - Sum Above

## 3. Non-SOV CO<sub>2</sub> Offset (Apply Fuel Efficiency and Emissions Factors)

$$\text{Non-SOV VMT} \times \frac{1 \text{ gallon gas}}{24 \text{ miles}} \times \frac{8.9 \text{ kg CO}_2}{1 \text{ gallon gas}}$$

# Proposed Quantitative Freight CO<sub>2</sub> Offset

## 1. Reduced Truck Delay - Get Back to Vehicle Hours of Delay (VHD)

- Divide total Person-Hours of Delay (PHD) by 1.2 Person/Vehicle

## 2. Reduced Truck Delay - Heavy Vehicle Hours of Delay (HVHD)

- Multiply VHD by project weighted average truck percent

## 3. Heavy Vehicle CO<sub>2</sub> Offset (Apply Fuel & Emissions Factors)

$$\text{HVHD (hours)} \times \frac{0.44 \text{ gallons}}{1 \text{ hour}} \times \frac{8.9 \text{ kg CO}_2}{1 \text{ gallon gas}}$$

**Final Quantitative Measure is sum of the two measures**

1. Non-SOV CO<sub>2</sub> Offset
2. Freight CO<sub>2</sub> Offset

# Example - Lafayette Boulevard Multimodal Improvements

VP

Non-SOV CO <sub>2</sub> Offset					
Factor	In App?	Supporting Information	Increased Users	Trip Length (miles)	VMT
Rail	X				
Bike	✓	Route 208 PNR lot - 10 bicycle lockers and 10 covered bicycle parking spaces	0.0	X 3.54	= 0.0
Pedestrian	✓	2000 ft sidewalk on the eastside of Lafayette Blvd (Sheetz to Family Dollar)	22.0	X 0.67	= 14.7
Park and Ride	✓	Route 208 PnR Lot - Add Transit Stations, Lighting, Bicycle Lockers/Parking	<b>VMT Summed by Segment = 122.8</b>		
Bus	✓	VRE Feeder Service and Bus Stop Improvements	<b>VMT Summed by Segment = 200.9</b>		
<b>Non-SOV VMT</b>					<b>338.4</b>
<b>Non-SOV CO<sub>2</sub> Offset (kg)</b>			$\frac{1 \text{ gallon gas}}{24 \text{ miles}} \times \frac{8.9 \text{ kg CO}_2}{1 \text{ gallon gas}}$		<b>125.5</b>

Freight CO <sub>2</sub> Offset				
Total Delay Reduction (Person-Hours)	÷	Persons/Vehicle	X	% Trucks
5.8	÷	1.2	X	0.13
<b>Freight Delay Reduction (hours)</b>				<b>0.63</b>
<b>Freight CO<sub>2</sub> Offset (kg)</b>			$\frac{0.44 \text{ gallons}}{1 \text{ hour}} \times \frac{8.9 \text{ kg CO}_2}{1 \text{ gallon gas}}$	
<b>Total CO<sub>2</sub> Offset</b>				<b>128.0</b>

**Slide 12**

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**VP5**    May want to remove - or make it generic  
VITA Program, 11/22/2021

## Environmental E.1 – Air Quality

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### **Part 1 - Improved Qualitative Process (Weight 50%)**

Normalized Non-SOV User Based Points + Normalized Freight Points



### **Part 2 - New Quantitative Calculation (Weight 50%)**

Non-SOV CO2 Offset + Freight CO2 Offset



**Proposed E.1 Measure for Round 5**

# Propose Combining Quantitative and Qualitative

## Final Proposed E.1 Score

- Weight Qualitative Method - 50%
- Weight Quantitative Method - 50%

## Impacts to E.1 Measure Top Scoring

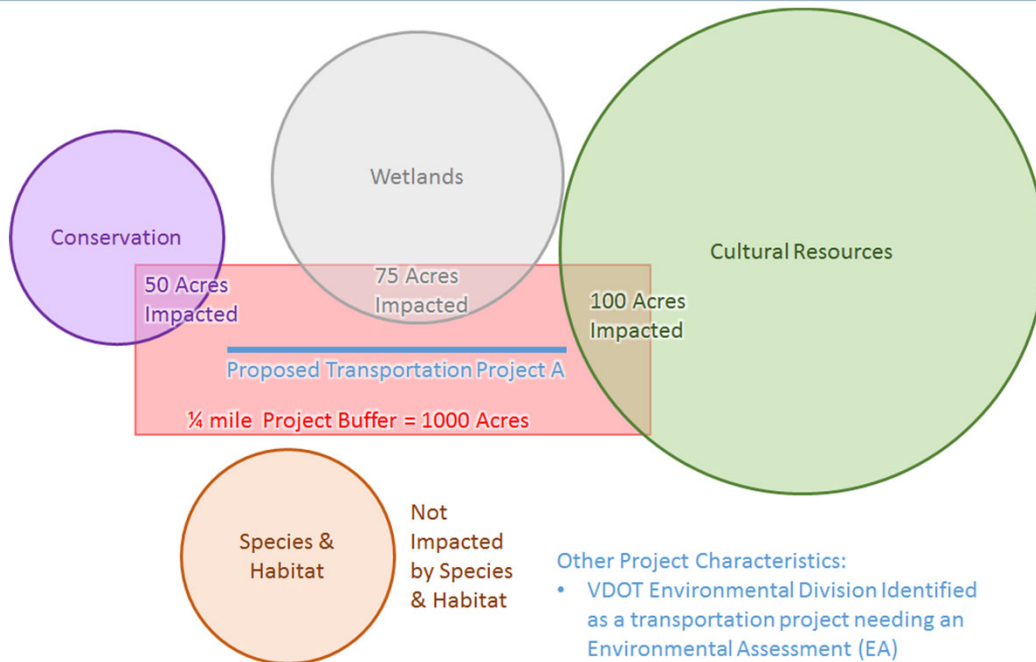
Rank E.1 Current	Rank E.1 Proposed	Display ID	Project Title
1	5	6867	Route 208 Operational and Multimodal Improvements
2	1	7198	Intercity Rail Service Expansion along US-29 & I-81 Corridors
3	7	6806	Rt 2 & 17 Widening from City Line to Shannon Airport Area
4	8	6719	Lafayette Boulevard Multimodal Improvements
5	9	7076	Town of Bowling Green US 301/Chase Street
6	11	6738	Weyers Cave Road (Rt. 256) Turn Lane Project
7	3	6842	I-64 WB Widening (Exit 211 to Exit 205)
8	4	6822	Route 1 (Fraley Boulevard) Widening
9	31	6815	BRITE Pedestrian Improvements
10	14	6799	I-81/Route 8 (Exit 114) Park & Ride Lot

## Additional New Top Scoring

Rank E.1 Proposed	Display ID	Project Title
2	6948	Mount Vernon Trail North Enhancements
6	6858	Upper King Street Multimodal Reconstruction
10	6809	Rte 15 Leesburg Bypass Interchange with Edwards Ferry Road

# E.2 (Impact to Natural and Cultural Resources) - Overview

Potential of project to minimize impact on natural and cultural resources located within project buffer



Project	Conservation	Species/ Habitat	Cultural Resources	Wetlands	Total Acres	Environmental Document Scale	Total Acres Scaled by Environmental Document	Impact Buffer Acres	Final Total Acres
A	50	0	100	75	225	EA (30%)	68	1000	68



# E.2 Process Improvements

## Tiering based on features selected

- Tier 1 = 30 ft
- Tier 2 = 1/8 mile
- Tier 3 = 1/4 miles

Project Feature	E.2 Tier
Access Management	1
Add/Construct Bike Lane	1
Bike/Pedestrian Other	1
Construct or Convert Existing General Purpose or Parking Lane to Bus-only Lane	1
Construct or Improve Bus Stop / Shelter	1
Construct Shared-Use Path	1
Construct Sidewalk	1
Improve Bike/Pedestrian Crossing (At Grade)	1
Improve Bike/Pedestrian Crossing (Grade Separated)	1
Improve Grade-Separated Interchange	1
Improve Rail Crossing	1
Increase Existing Route Service – Addtl Vehicles or Increased Frequency	1
Innovative Intersection(s) / Roundabout(s)	1
Intercity Passenger Rail Service Improvements	1
Intersection Improvement(s)	1
ITS Improvement(s) / Adaptive Signal Control	1
New Intersection	1
New Route/Service	1
New Traffic Signal	1
New/Expanded Vanpool or On-Demand Transit Service	1
Other Transit Technology Improvements	1
Rail Service Improvements	1
Ramp Improvement(s)	1

Project Feature	E.2 Tier
Road Diet	1
Roadway Reconstruction/Realignment	1
Shoulder Improvement(s)	1
TDM Other	1
Traffic Signal Modification	1
Turn Lane Improvement(s)	1
Widen Existing Lane(s) (No New Lanes)	1
Construct/Expand Bus Facility	2
Freight Rail improvements	2
Improve Park and Ride Lot	2
New Intercity Passenger Rail Station or Station Improvements	2
New Park and Ride Lot	2
New Station or Station Improvements	2
Right-of-Way/Easements acquisition required	2
Add New Through Lanes(s)	3
Highway Other	*
Improve/replace existing bridge(s)	3
Managed Lane(s) (HOV/HOT/Shoulder)	3
New Bridge	3
New Interchange, Limited Access Facility	3
New Interchange, Non-Limited Access Facility	3
Rail Transit Other	3
Roadway on New Alignment	3

## E.2 Outcomes

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- **Improved Distribution**

- Projects in Tier 1 (30' buffer) either improved in SMART SCALE rank or remained at the exact same rank
- Projects in Tier 2 (1/8th mile) projects on average changed by less than one position in SMART SCALE rank
- Projects in Tier 3 (1/4th mile) fell an average of 4 positions in SMART SCALE rank

# Land Use

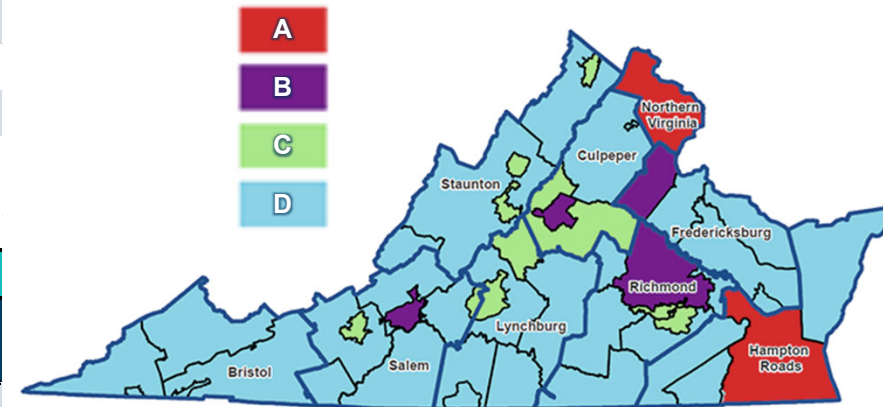
Future Transportation Efficient Land Use (L.1) and **Increase** in Transportation Efficient Land Use (L.2)

- What they have in common is - the non-work accessibility, or the number of key non-work destinations that are accessible within a **reasonable walking distance**, scaled by population density
- **Apply Land Use to all Area Types**
  - **Weighting Changes for Type C & D Considered**
  - **Use a 1 Mile Buffer instead of 3 Mile Buffer**
    - 1 mile walk is closer to the average pedestrian trip length

# Potential Weighting Adjustments

Existing						
Area Type	Congestion	Safety	Accessibility	Environment	Economic Development	Land Use
A	45%	5%	15%	10%	5%	20%
B	15%	20%	25%	10%	20%	10%
C	15%	25%	25%	10%	25%	
D	10%	30%	15%	10%	35%	

Proposed						
Area Type	Congestion	Safety	Accessibility	Environment	Economic Development	Land Use
A	45%	5%	15%	10%	5%	20%
B	15%	20%	20%	10%	20%	15%
C	15%	25%	15%	10%	25%	10%
D	10%	30%	10%	10%	30%	10%



# Cost Estimates

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- August 2, 2021 VDOT Published Cost Estimating Manual and an associated Implementation Plan (IIM)
- Cost Estimate Workbook (Consistent Summary and Transparency)
- Cost Estimating Manual Overview Training
- In-Person, In-Depth Training by District (Winter 2022)

# Pre-Scoping Module



The screenshot displays the SMART PORTAL interface for viewing a pre-scoping application. At the top, there are navigation links: Home, New Application, Dashboard, and About. On the right, there are notification icons for 68 messages, 200 alerts, and 46 tasks, along with the user name Sarah Rhodes. The main heading is "Viewing Pre-Scoping 2022 Application" with the application name "Test".

Key application details include:

- Project Status: Pending
- Organization: VDOT
- Project ID: 7576
- Created: 08/02/2021 @ 8:21AM by Sarah Rhodes
- Last Updated: 08/02/2021 @ 8:21AM by Sarah Rhodes

Below the details are action buttons: Edit Application, Print Version, Save as PDF, Archive Application, and Delete Application. A navigation bar includes icons for General, Eligibility, Location, Delivery/Funding, and Supporting Documents. The "General" tab is active, showing the following information:

### Point of Contact Information

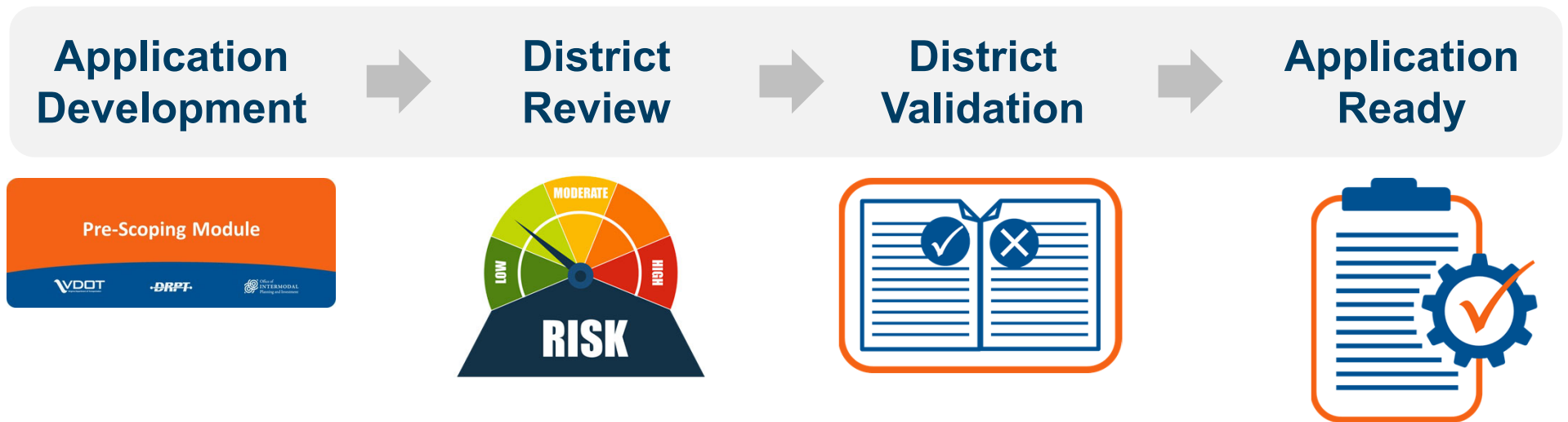
Point of Contact

Name	Email	Telephone

### Project Information

Project Title Test	Principal Improvement
Project Short Description	
Does this project include any improvements to non-VDOT maintained roadways?	VDOT District
Application Program Requested	

# Year Round Pre-Application



# SMART Portal Pre-Scoping Module Training

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**Pre-Scoping Module - SMART Portal - Statewide Training**  
**No Registration Required, Will be recorded**

<https://covaconf.webex.com/covaconf/j.php?MTID=m17caf8c0ae5036bf5a0308d337f79ca7>

**Thursday, Dec 2, 2021 1:00 pm** | 1 hour 30 minutes

Meeting number: 2435 764 2860

Password: PJrs2KZW2e7

## **Or Join by phone**

+1-517-466-2023 US Toll

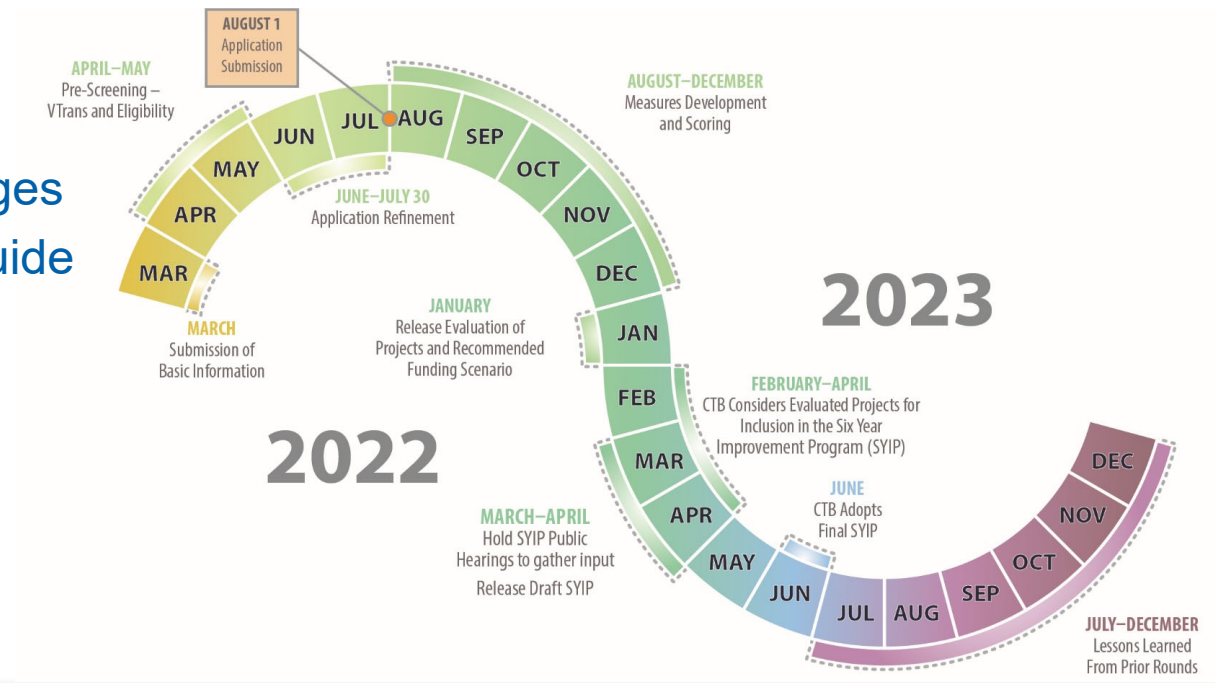
+1-866-692-4530 US Toll Free

Access code: 243 576 42860



# Next Steps

- **Continued Intake of Public Comments**
- **December**
  - Pre-Scoping Module Training
  - Seeking Action Round 5 Changes
  - Release Updated Technical Guide
- **February**
  - Portal Pre-Application Training





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Thank you VP12  
Questions and comments – [Brooke.Jackson@OPI.Virginia.gov](mailto:Brooke.Jackson@OPI.Virginia.gov)



**Slide 25**

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**VP12**    increase font size  
VITA Program, 11/22/2021