



COMMONWEALTH of VIRGINIA
Office of the
SECRETARY of TRANSPORTATION

SMART SCALE
RRTPO Technical Advisory Committee Meeting

November 9, 2021



Overview

- Round 4 Recap
- Round 4 Feedback
- Round 5 Changes being Considered
- Leveraging Data
- Pre-Scoping Module
- Next Steps

Round Review

	Round 1	Round 2	Round 3	Round 4
Scored	321	436	468	397
Requested Funding	\$7.2 B	\$9.7 B	\$ 7 B	\$6.3 B
Available Funding	\$1.4 B	\$1 B	\$780 M	\$1.4 B
	5 YRs of funding	2 YRs of funding Bonus (\$300M I-66)	2 YRs of funding	2 YRs of funding Omnibus Introduced

Round 4 Consensus Scenario

District	Scored Applications	Funded	Average of SMART SCALE Score (Funded)	Average SMART SCALE \$ Request (Funded)	Average of Leveraged (Funded)	Percent Leveraged (Funded)
Bristol	34	17	3.9	\$5,306,553	\$0	0%
Culpeper	36	21	11.6	\$7,819,611	\$1,381,510	18%
Fredericksburg	35	12	9.8	\$9,442,923	\$5,719,397	61%
Hampton Roads	53	24	24.1	\$7,016,327	\$834,301	12%
Lynchburg	29	11	2.2	\$14,041,976	\$3,354,298	24%
Northern Virginia	30	11	20.0	\$21,670,983	\$14,175,253	65%
Richmond	75	19	7.9	\$9,824,091	\$241,882	2%
Salem	59	29	7.5	\$4,922,888	\$494,601	10%
Staunton	45	22	7.7	\$3,594,004	\$56,982	2%
Grand Total	397	167	10.8	\$8,308,157	\$3,199,913	

Revenue Recovery (CTB Presentation October 2021)

Priority Projects from SMART SCALE Round 4

- Funds allocated generally in line with District Grant Program percentages
- Richmond District proposed allocation \$42.7 Million (14.5%)

http://www.ctb.virginia.gov/resources/2021/oct/pres/9_transportation_revenues_and_opportunities_part_2.pdf

Project	Applicant	Amount
Gillies Creek Greenway	City of Richmond	\$3.8M
Clay St Streetscape Improvements	City of Richmond	\$8.3M
Alverser at Old Buckingham Roundabout	Chesterfield County	\$7.9M
James River Branch Trail	City of Richmond	\$14.3M
Matoaca Rd at Woodpecker Rd Roundabout	Chesterfield County	\$7.1M

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 Accomodations 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
Total Points Possible 8.5 points maximum*	
Measure Scaling: *Points are multiplied by the increased number of peak period non-SOV users	

+

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
Total Points Possible 1.5 points maximum**	
Measure Scaling: **Points are multiplied by peak period truck volumes	

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	✗		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 Accomodations EV	✗		0.5			Proposed Removal		
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						(divide by maximum score in cohort and multiply by 100)		
						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	✗		0.5					
Reduces Delay with High Truck	✓	13% Trucks (3515 Peak Period Volume)	1	x	3515 = 3515			
<u>Points based on Delay Reduction</u>								
0 < Delay Reduction < 2 = 0.5 point								
2 <= Delay Reduction < 100 = 1 point								
Delay Reduction >= 100 = 2 points								
5.88 Person-Hours of Delay Reduced (From C.2 Score)						1	X	3515 = 3515.0
Freight Delay Reduction Points			1		3515	1		3515
Freight Delay Reduction Normalized Measure						(divide by maximum score in cohort and multiply by 100)		
						100.0		
Total Measure			= 3957.5			Weight Each 50% = 54.4		

Results Summary

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					Proposed Removal				
0.5	X	59	=	29.5	0.5	X	31	=	15.5
Sum = 442.5					Sum = 100.5				
					(divide by maximum score in cohort and multiply by 100) 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	
					(divide by maximum score in cohort and multiply by 100) 100.0				
Total Measure = 3957.5					Weight Each 50% = 54.4				

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

Impacts to E.1 Measure Top Scoring

Rank E.1 Current	Rank E.1 Proposed	Display ID	Project Title
1	2	6867	Route 208 Operational and Multimodal Improvements
2	1	7198	Intercity Rail Service Expansion along US-29 & I-81 Corridors
3	3	6806	Rt 2 & 17 Widening from City Line to Shannon Airport Area
4	4	6719	Lafayette Boulevard Multimodal Improvements
5	5	7076	Town of Bowling Green US 301/Chase Street
6	7	6738	Weyers Cave Road (Rt. 256) Turn Lane Project
7	9	6842	I-64 WB Widening (Exit 211 to Exit 205)
8	8	6822	Route 1 (Fraley Boulevard) Widening
9	10	6815	BRITE Pedestrian Improvements
10	11	6799	I-81/Route 8 (Exit 114) Park & Ride Lot
Rank E.1 Proposed	Display ID	Project Title	
6	6948	Mount Vernon Trail North Enhancements	

Proposed Quantitative Calculate CO₂ Offset

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 CO2 Offset + Reduced Truck Delay CO2 Offset

Proposed Quantitative Non-SOV CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 Measure is sum of the two measures

1. **Non-SOV CO₂ Offset**
2. **Freight CO₂ Offset**

Example - Lafayette Boulevard Multimodal Improvements

Non-SOV CO ₂ Offset						
Factor	In App?	Supporting Information	Increased Users	Trip Length (miles)		VMT
Rail	✗					
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	VMT Summed by Segment			= 122.8
Bus	✓	VRE Feeder Service and Bus Stop Improvements	VMT Summed by Segment			= 200.9
Non-SOV VMT						338.4
Non-SOV CO ₂ Offset (kg)			x <u>1 gallon gas</u> x <u>8.9 kg CO₂</u> 24 miles 1 gallon gas			125.5

Freight CO ₂ Offset				
Total Delay Reduction (Person-Hours)	÷	Persons/Vehicle	X	% Trucks
5.8	÷	1.2	X	0.13
Freight Delay Reduction (hours)				0.63
Freight CO ₂ Offset (kg)			$\frac{0.44 \text{ gallons}}{1 \text{ hour}} \times \frac{8.9 \text{ kg CO}_2}{1 \text{ gallon gas}}$	2.46
Total CO ₂ Offset				128.0

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

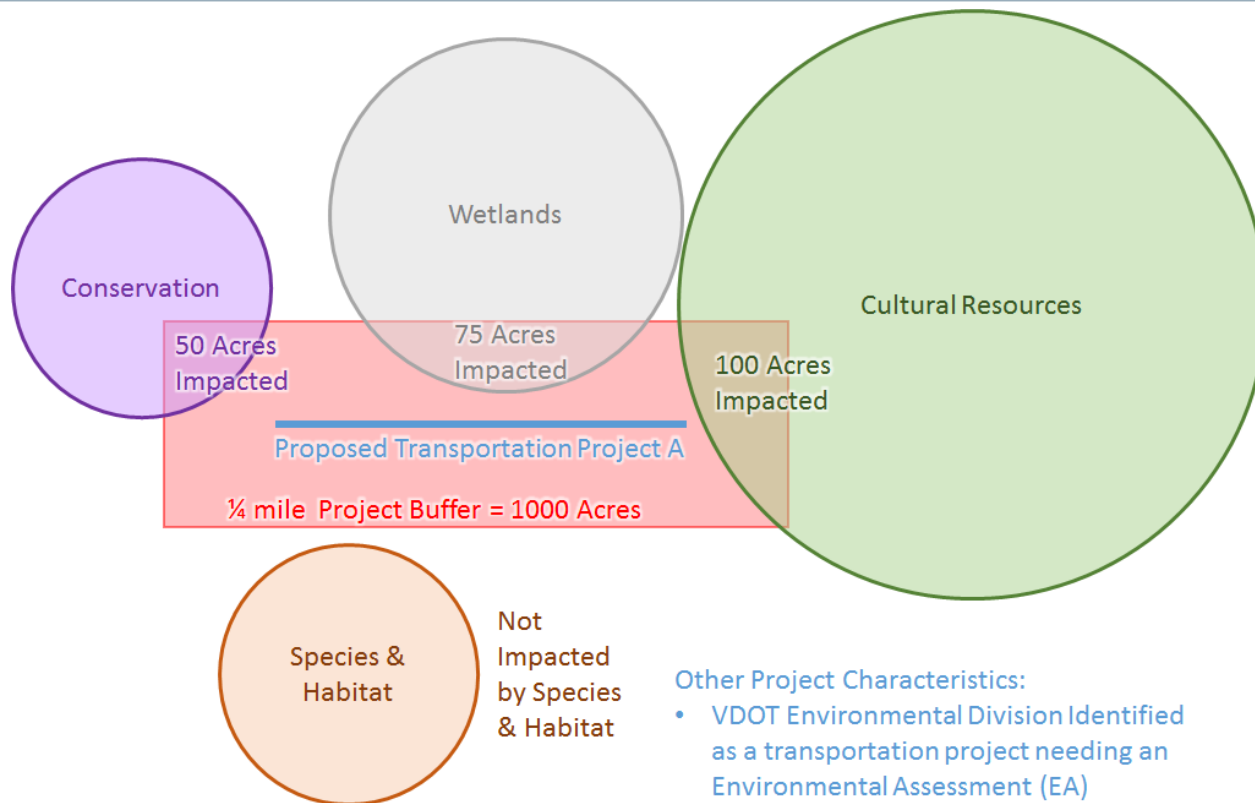
Rank E.1 Current	Rank E.1 Proposed	Display ID	Project Title
1	5	6867	Route 208 Operational and Multimodal Improvements
2	1	7198	Intercity Rail Service Expansion along US-29 & I-81 Corridors
3	7	6806	Rt 2 & 17 Widening from City Line to Shannon Airport Area
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Additional 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	3
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

- **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
- **Statewide - only 2 projects impacted in funding scenario**

Land Use

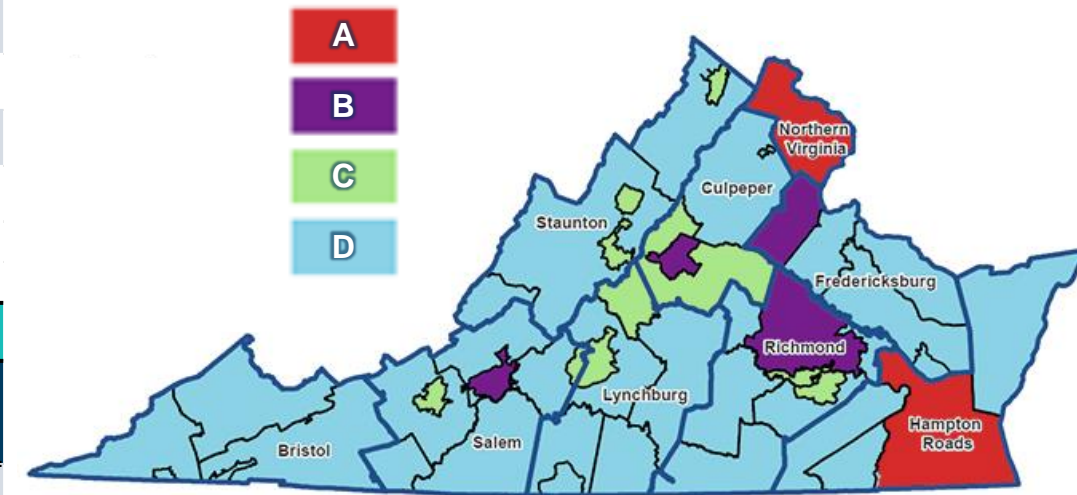
Future Transportation Efficient Land Use (L.1) and **Increase** in Transportation Efficient Land Use (L.2)

- 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
- **Multiple Scenarios Tested**
- **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

- **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**
 - Currently Internally Available
 - VDOT University Winter 2022
- **In-Person, In-Depth Training by District (Winter 2022)**

Leveraging Data

- How do projects with leveraged funds perform?

	Applications with No Leveraged Funds	Applications with Leveraged Funds	Percent with Leveraged Funds	Percent <u>Funded</u>	Percent <u>Funded</u> with No Leveraging	Percent <u>Funded</u> with Leveraging
RRTPO Localities	28	15	54%	26%	14%	12%
All	303	94	31%	39%	29%	11%

- Request amount is a stronger predictor than benefit
- Most applicants don't leverage enough funds to bring the cost down
- Project request amount is a more linear predictor of application success than Benefit Score and SMART SCALE Score somewhere between the two

Round 4 Request Amount

Request Amount	Requested	Funded	% Success
\$250,000	1	1	100%
\$500,000	3	3	100%
\$1,000,000	9	5	56%
\$3,000,000	55	28	51%
\$5,000,000	62	34	55%
\$7,000,000	44	21	48%
\$10,000,000	62	29	47%
\$15,000,000	65	18	28%
\$20,000,000	26	6	23%
\$25,000,000	14	1	7%
\$50,000,000	34	9	26%
\$100,000,000	13	1	8%
\$150,000,000	4	0	0%
\$200,000,000	3	0	0%
\$250,000,000	2	0	0%
>250,000,000	0	0	0%

Leveraging Data

DISPLAY ID	DESCRIPTION	Total \$	SMART SCALE Request	Benefit Score	SMART SCALE Score
6842	I-64 WB Widening (Exit 211 to Exit 205)	\$75,111,201	\$75,111,201	22.0	2.9
6841	I-64 EB Widening (Exit 205 to Exit 211)	\$73,454,991	\$73,454,991	14.6	2.0
6949	Staples Mill Road Improvements	\$27,707,472	\$27,707,472	12.8	4.6
6893	W Broad Street Short Pump	\$22,977,377	\$22,977,377	9.1	4.0
6828	Parham Road and I-64 Interchange Improvements	\$15,602,382	\$15,602,382	5.6	3.6
6931	Matoaca Road at Woodpecker Road - Roundabout	\$7,097,310	\$7,097,310	3.4	4.8
6930	Route 360 at Brad McNeer Parkway - Continuous Green-T	\$12,563,261	\$11,763,261	5.8	4.9

Pre-Scoping Module



Pre-Scoping Module



[Home](#) [New Application](#) [Dashboard](#) [About](#)

68 200 46 Sarah Rhodes

Viewing Pre-Scoping 2022 Application

Test

Project Status: Pending

Organization: VDOT

Project ID: 7576

Created: 06/02/2021 @ 8:21AM by Sarah Rhodes
Last Updated: 06/02/2021 @ 8:21AM by Sarah Rhodes

Edit Application

Print Version

Save as PDF

Archive Application

Delete Application



General



Eligibility



Location



Delivery/Funding



Supporting Documents

General

Point of Contact Information

Point of Contact

Point of Contact

Name	Email	Telephone
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Project Information

Project Title

Test

Principal Improvement

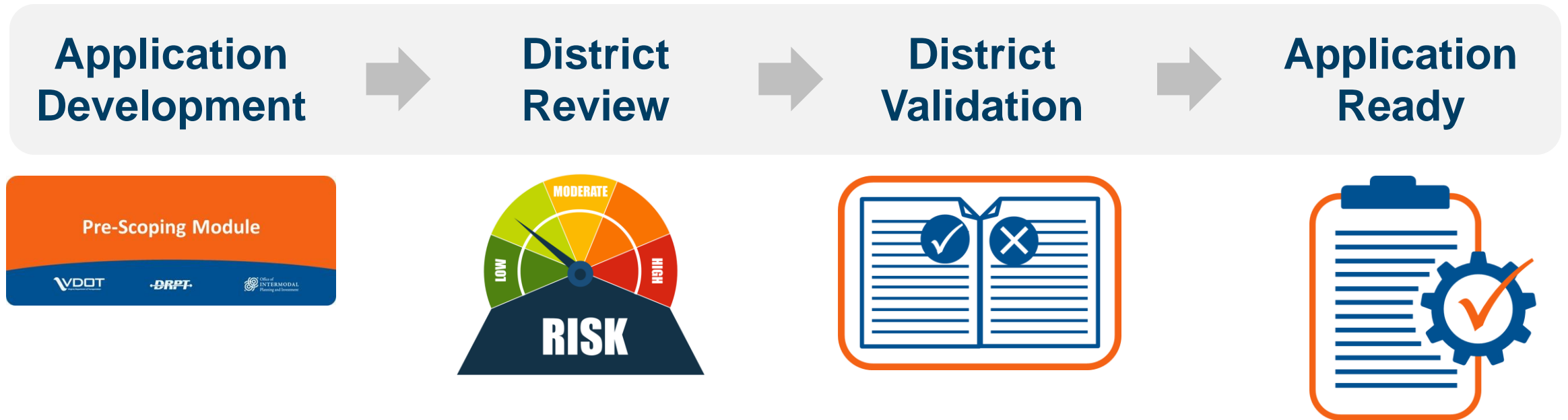
Project Short Description

Does this project include any improvements to non-VDOT maintained roadways?

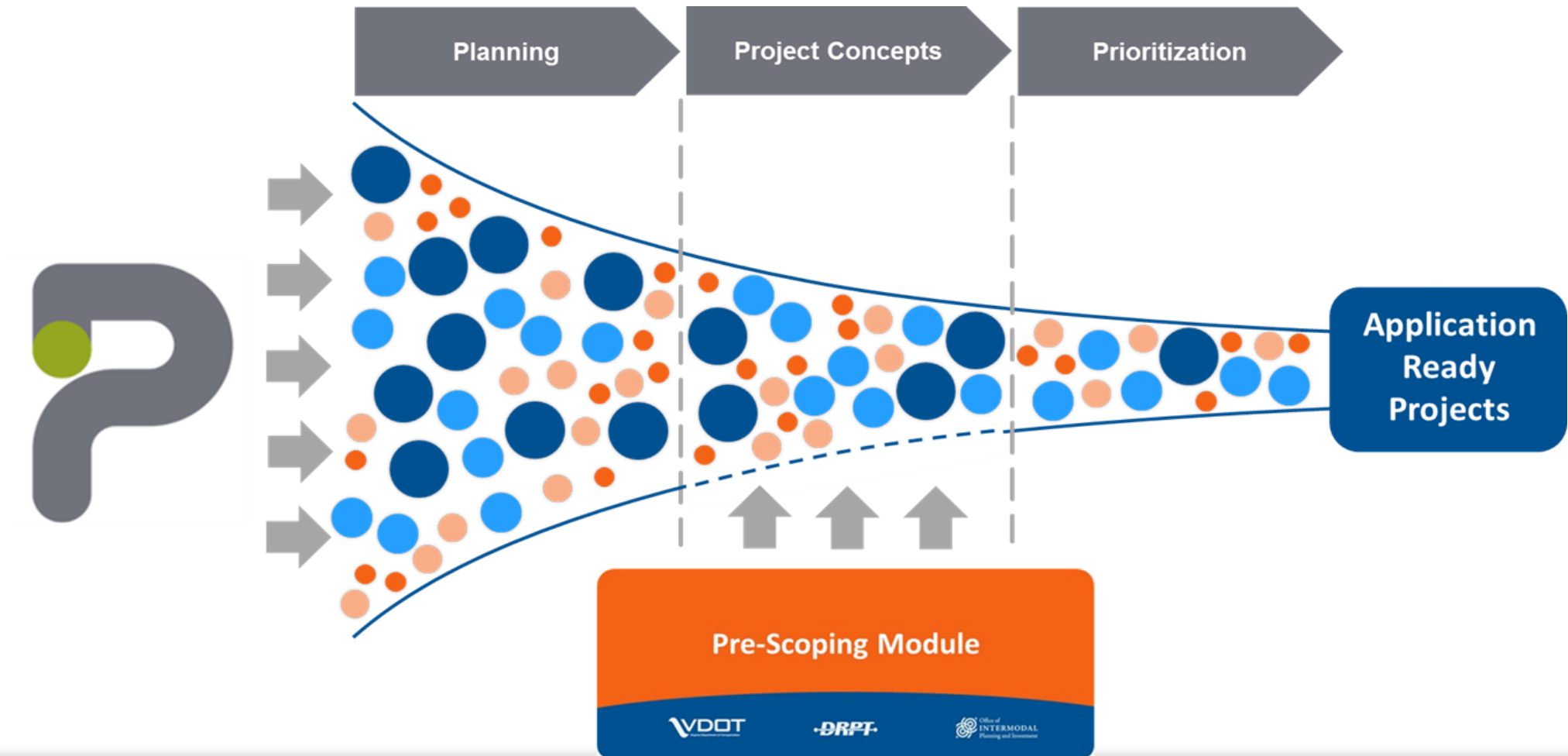
VDOT District

Application Program Requested

Year Round Pre-Application



Year Round Pre-Application



SMART Portal Resources

- <https://smartportal.virginiahb2.org/#/about>
- <http://smartscale.org/resources/default.asp>

Contact information:

- **SMART Portal Mailbox – Feedback/Questions**
smartportal@ctb.virginia.gov
- **Jason Robinson – Assistant Director, VDOT Infrastructure Investment**
Jason.Robinson@vdot.Virginia.gov
- **Sarah Rhodes – Senior Program Management Specialist, VDOT Infrastructure Investment**
Sarah.Rhodes@vdot.Virginia.gov

Next Steps

- **Pre-Scoping Module Open NOW**
 - Email invitation via District Planners for Public Training on 12/2/21
- **Live Webinar (recorded) presenting proposed Round 5 changes**
 - Email blast will be sent to Portal users
- **December CTB Adopt Round 5 Changes**
- **Technical Guide Release by End of Year**
- **March 2022 Pre-Application Open**



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Thank you.

