COMMONWEALTH of VIRGINIA

Commonwealth Transportation Board

W. Sheppard Miller, III
Chairperson

1401 East Broad Street
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COMMONWEALTH TRANSPORTATION BOARD
WORKSHOP AGENDA

VDOT Central Office Auditorium
1221 East Broad Street Richmond, Virginia 23219
March 15, 2022
12:45 p.m.

1. Map 21 Reliability Target Setting
   Mena Lockwood, Virginia Department of Transportation

2. Mondelez Rail Industrial Access Project
   Mike Todd, Virginia Department of Rail and Public Transportation

3. SMART SCALE Budget Increase Request
   Nike Park Road Extension from Reynolds Drive to US Route 17
   Hampton Roads District
   Kim Pryor, Virginia Department of Transportation

4. Preliminary FY 2023 – 2028 Commonwealth Transportation Fund Six-Year Financial Plan
   Laura Farmer, Virginia Department of Transportation

5. Legislative Update
   Jo Anne Maxwell, Virginia Department of Transportation

6. Director's Items
   Jennifer Mitchell, Virginia Department of Rail and Public Transportation

7. Commissioner's Items
   Stephen Brich, Virginia Department of Transportation

8. Secretary's Items
   Shep Miller, Secretary of Transportation

# # #

MAP-21 INTERSTATE RELIABILITY MEASURE TARGET SETTING METHODOLOGY

Presentation to Commonwealth Transportation Board

Traffic Engineering Division, VDOT

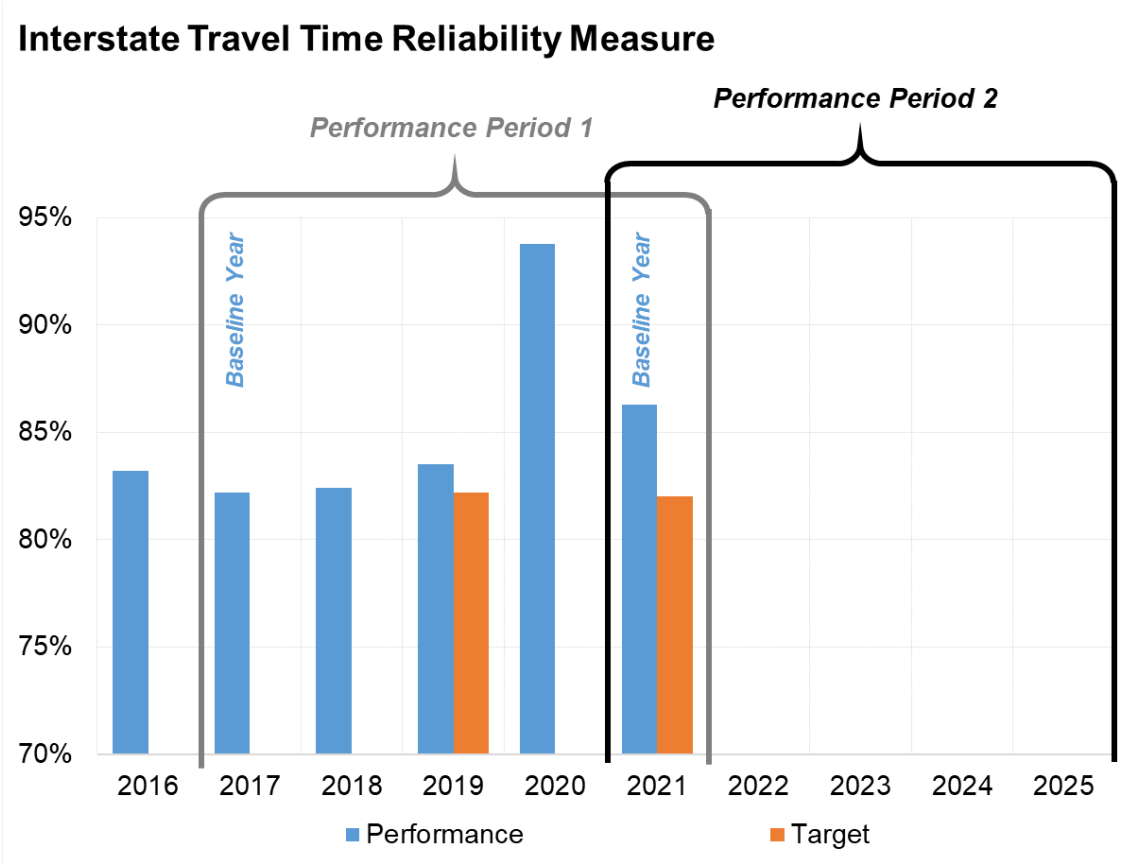
March 15, 2022

Presentation Outline

- Federal Performance Measure
  - Definition & Understanding
- Target Setting
  - Past and Future Data
  - Modeling
  - Prediction
- Next Steps
- Questions

MAP-21 Requirement for Interstate Reliability Measure

- **States:**
  - Establish Interstate Travel Time Reliability Measure targets for 2 and 4 years at Statewide and MPO levels
  - If necessary States may adjust target at 2 years
- **FHWA:**
  - Assess whether State achieved or made significant progress towards targets every 2 years
  - If not, States must report the actions it will take to achieve targets.



Moving Ahead for Progress in the 21st Century (MAP-21) Law

Measure:

Percent of Person Miles Traveled on the Interstate that are Reliable or Interstate Travel Time Reliability Measure

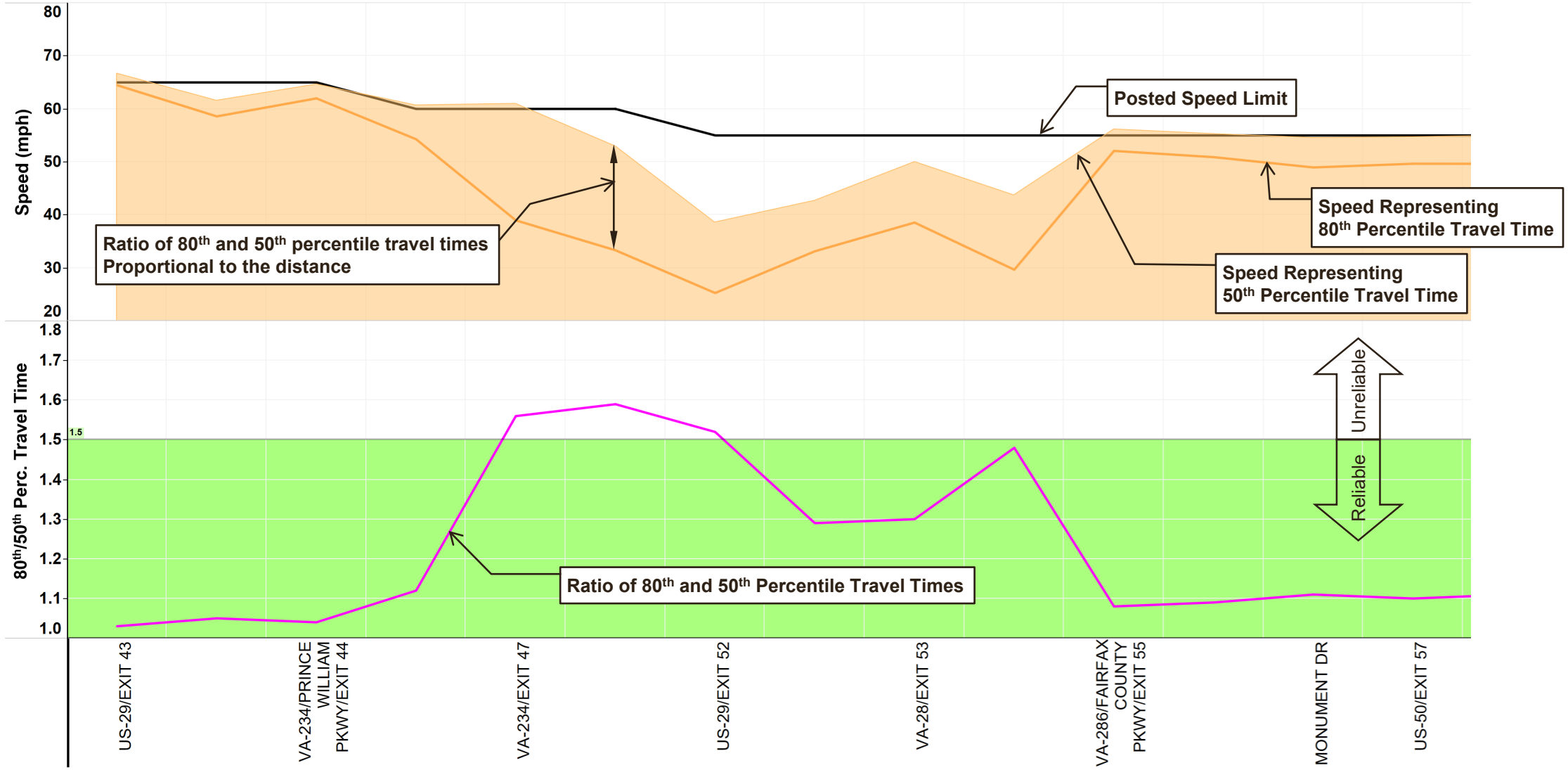
Formula	Condition for a Segment to be *Reliable*
$$Interstate\ Travel\ Time\ Reliability\ Measure = 100 \times \frac{Total\ Reliable\ Person\ Miles\ on\ Interstate}{Total\ Person\ Miles\ on\ Interstate}$$	$\frac{80th\ Percentile\ Travel\ Time}{50th\ Percentile\ Travel\ Time} < 1.5 \rightarrow$ *In ALL 4 Time Periods** *Example of Reliable Trip: You add no more than 50% additional time to your normal travel time to arrive on-time 80% of the times*

* **Time Periods:** Weekdays • AM Peak (6a - 10a) • Mid Day Peak (10a - 4p) • PM Peak (4p - 8p)
Weekends • Majority hour of Traffic (6a - 8p)

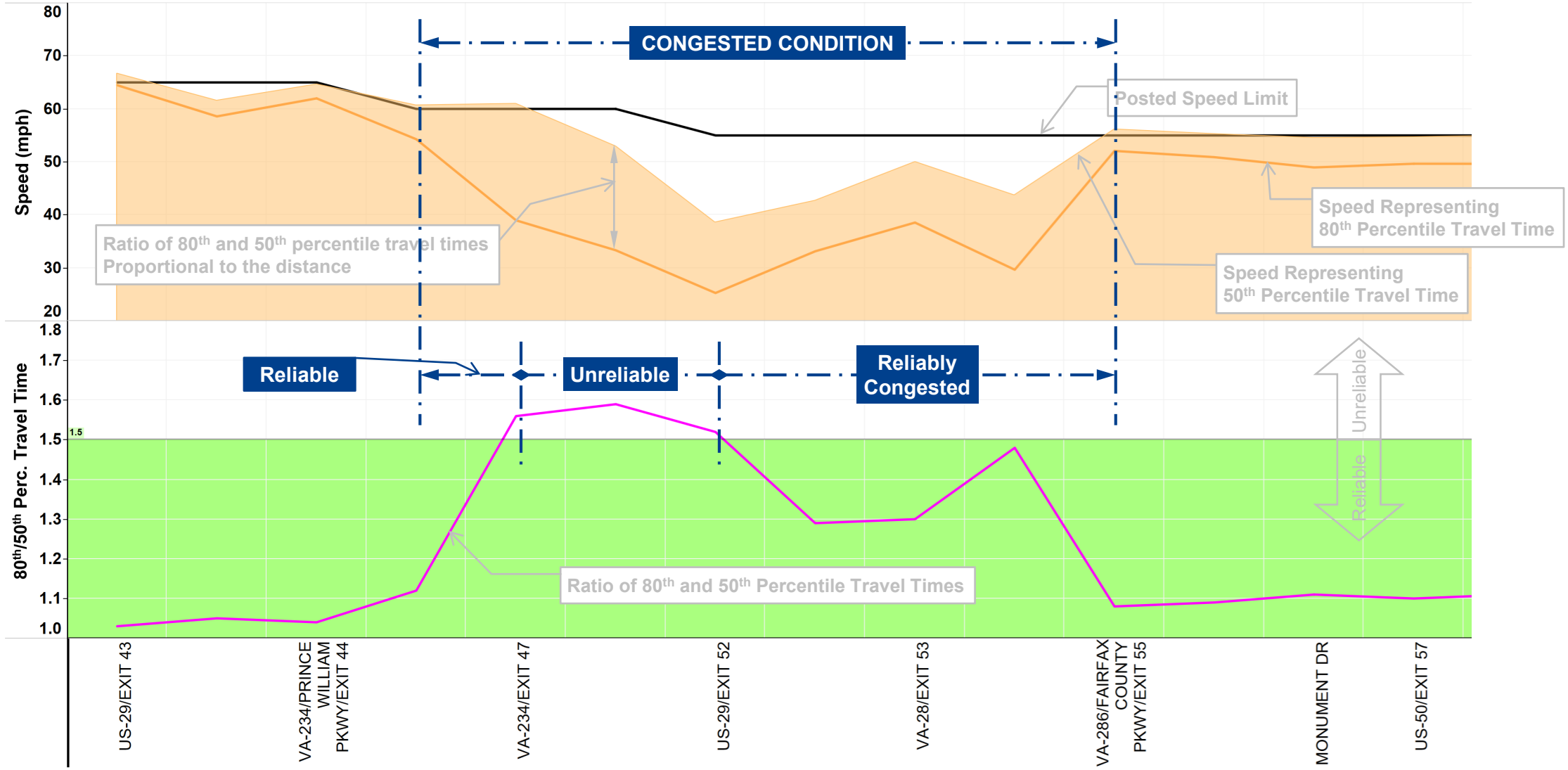
- One value calculated for the Interstate System in Virginia for a Calendar Year
  Example: Virginia's Interstate Travel Time Reliability Measure in Year 2019 was 83.55%

Target to be calculated for Interstate Travel Time Reliability Measure

Example: I-66 EB AM Peak (6 AM – 10 AM)



Example: I-66 EB AM Peak (6 AM – 10 AM)



Target Setting Steps

A. Prepare Input Data for Variables

B. Develop Model for Prediction

C. Validate Model

D. Prepare Future Years' Data

E. Predict Interstate Travel Time Reliability Measure for future years

A

Interstate Speed and Travel Time – Potential Influencers

Roadway Geometry

- **Segment Length**
- **FHWA Network**
- Number of Lanes
- Terrain

Traffic

- **Annual Average Daily Traffic (AADT)**
- **Occupancy Factor**
- Growth Rate of Daily Vehicle Miles Traveled
- Volume Capacity Ratio (v/c)
- Heavy Vehicle %

Urban Category

- Urbanized
- Urban Cluster
- Rural

Event

- Crashes
- Incident Duration
- Adverse Weather

Operations Improvement Program

- Safety Service Patrol

Roadway Improvement Types

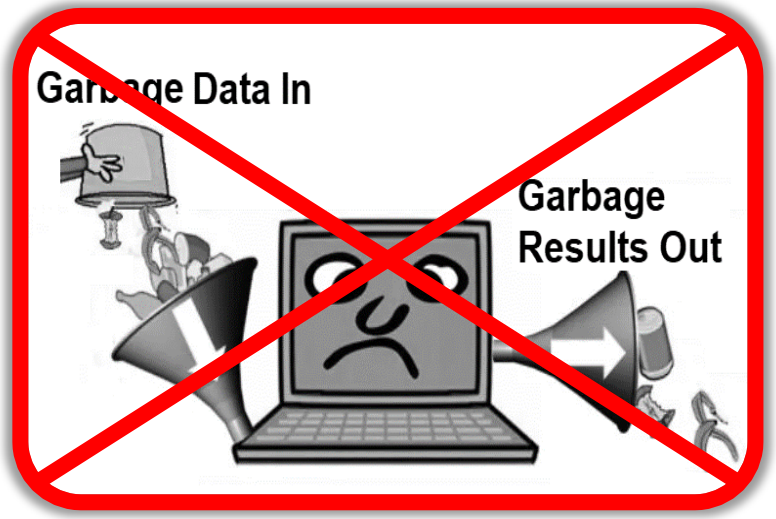
- Capacity Improvement
- Acceleration/ Deceleration Lane Extension

Based on Influencers, Identified 30 Independent Variables

A

Data Collection, Exploration, and Preparation

Data collected for Potential Influencers for years 2017 to 2024



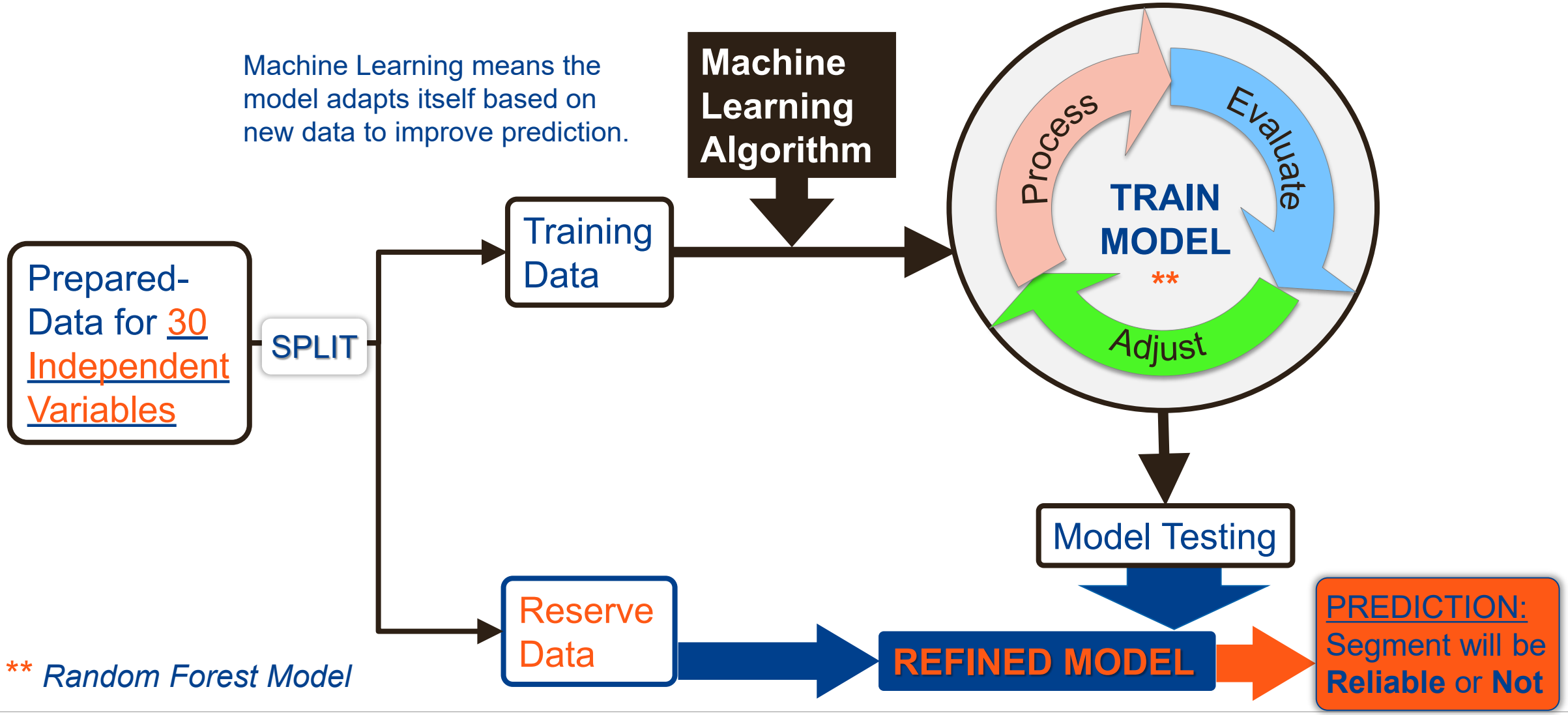
- **Data Cleaning**
  - Identify Incomplete, Inaccurate and/or Inconsistent data
  - Replace, modify, or delete as necessary
- **Data Exploration and Visualization**
- **Data Organization**

Prepared Data for 30 Independent Variables

B

Model Development

Machine Learning means the model adapts itself based on new data to improve prediction.



** *Random Forest Model*

C

Validation

Validation of Statewide Measure

Year	Predicted PMTR-IS	Actual PMTR-IS	Error
2017	82.71%	82.48%	0.28%
2018	82.87%	82.62%	0.30%
2019	83.30%	83.55%	-0.30%
2020	94.19%	93.80%	0.42%
2021	87.25%		

Very Small

- **Model may be used to Predict Interstate Travel Time Reliability Measure**

D

Prepare Data for Future Years

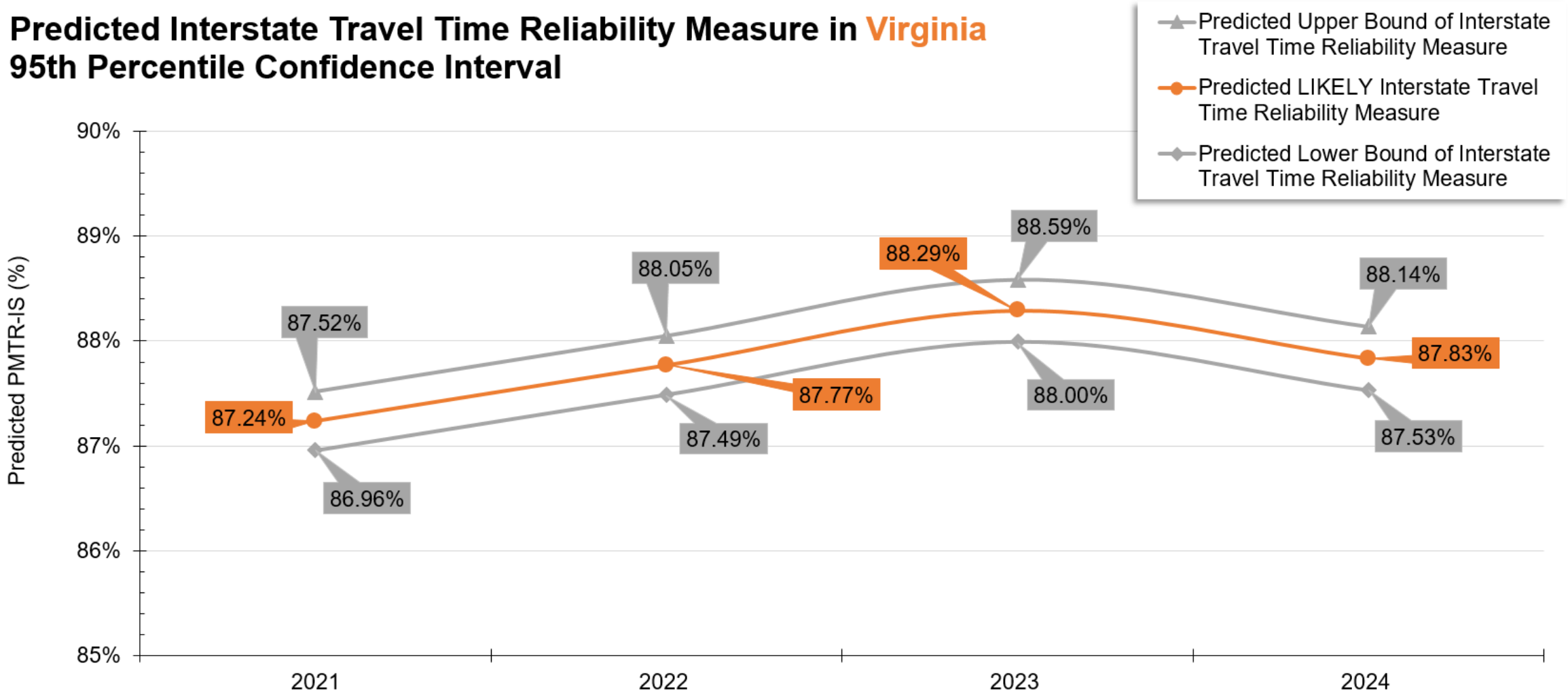
- **Future Year Number of Lanes based on Six Year Improvement Program Project Types, Completion between 2022 and 2024:**
  - Capacity Improvement
  - Acceleration/ Deceleration Lane Extension

- **Future Year v/c, AND Future Year Crashes based on:**
  - Future Year Number of Lanes
  - Projected AADT using yearly Growth Factor

❖ **Future Year Number of Lanes, Future Year v/c, and Future Year Crashes used in Model**

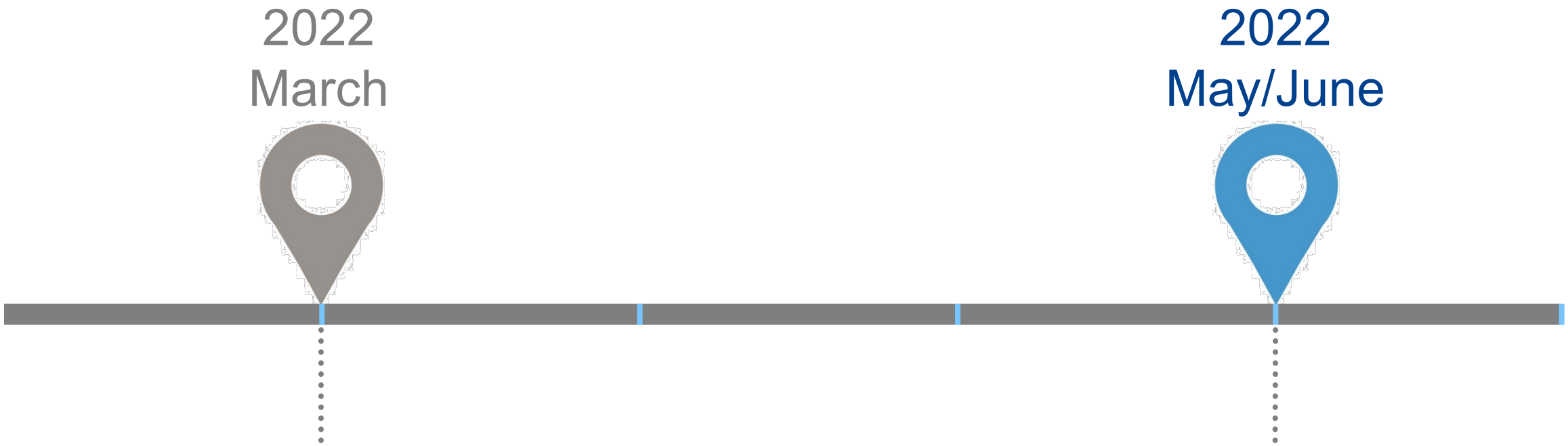
E

Interstate Travel Time Reliability Measure Prediction – Statewide



*** 2021 December Data was not available at the time of this Calculation, Model will be re-run after 2021 AADT is available**

Timeline for CTB Presentation



Statewide MAP-21 Interstate Travel Time Reliability Measure Target Setting Methodology

Statewide MAP-21 Interstate Travel Time Reliability Measure

- **2021 Reliability (Baseline)**
- **2 year Target for year 2023**
- **4 year Target for year 2025**

Reliability Measure Characteristics Needed for Virginia

MAP-21 Interstate Travel Time Reliability Measure Does Not Meet Virginia's Reliability Measure Need

- Large Time Periods (4/6/10 hrs) do not reflect peak hour travel conditions, and the Reliability fluctuations.
- One set of peak period for the entire State is not appropriate as peak period travel patterns vary by region.
- One calendar year span does not reflect seasonal variations, therefore not useful for addressing any season specific issues.
- Limited Geographical Scale (Statewide and MPO) therefore not sensitive to improvements with limited area of influence

Reliability Performance Measures for Virginia

Virginia needs appropriate Reliability Measures to:

- Compare Improvement Alternatives
- Capture Benefits of Traffic Management
- Sensitive to Investment Strategies
- Assess System Performance in Virginia

Questions?

Rail Industrial Access – Mondelez International

CTB Workshop – March 15, 2022

Michael Todd, Director of Rail Programs
Department of Rail and Public Transportation

DRPT
Virginia Department of Rail and Public Transportation

Introduction

Mondelez International

Bakery

Processing Materials

Location


Front Royal
Arlington
Manassas
Harrisonburg
Staunton
Charlottesville
Clifton Forge
Richmond
Lynchburg
Burkeville
Petersburg
(NCVA)
(NPB)

Site Details

Application Details

Budget
Total $55M
Rail $4M
Request $450K
Score 20

Application Details

Budget	Carloads
Total $55M	**Existing** 859
Rail $4M	**New** 1,030
Request $450K	**Score** 20
Score 20	

Application Details

Budget	Carloads	Employment
Total $55M	**Existing** 859	**Jobs** 140
Rail $4M	**New** 1,030	**Score** 20
Request $450K	**Score** 20	
Score 20		

Application Details

Budget	Carloads	Employment	Score
Total $55M	**Existing** 859	**Jobs** 140	**Budget** 20
Rail $4M	**New** 1,030	**Score** 20	**Carloads** 20
Request $450K	**Score** 20		**Jobs** 20
Score 20			**Local EDA** 10
			Total 70

Annual Project Benefits

Measure	Savings
Safety	$1.8M
Congestion	$100k
Pavement Maintenance	$60k
Emissions	$50k
Total Savings: Over $2M	

Total GHG Reduction:
2,800 Tons

Recommendation

Today

- Consider Project

Next Month

- Resolution of Approval

Next Step

- Execute Grant Agreement

SMART SCALE BUDGET INCREASE REQUEST

NIKE PARK ROAD EXTENSION FROM REYNOLDS DRIVE TO US ROUTE 17 HAMPTON ROADS DISTRICT

Commonwealth Transportation Board

Kimberly Pryor – Director, Infrastructure Investment

March 15, 2022

SMART SCALE Policy

SMART SCALE Policy on Scope Changes and/or Budget Increases, December 2021

- Significant changes to the scope or cost of a SMART SCALE project require a re-evaluation
- Board action is required to approve a SMART SCALE budget increase:
  - i. Total Cost Estimate <$5 million: 20% increase in funding requested
  - ii. Total Cost Estimate $5 million to $10 million: $1 million or greater increase in funding requested
  - iii. Total Cost Estimate > $10 million: 10% increase in funding requested; $5 million maximum increase in funding requested

Project Information

Nike Park Road Extension from Reynolds Drive to US Route 17 (UPC 109314)

Submitted by Isle of Wight County in Round 1 of SMART SCALE

- Total original project cost: $11,658,000
- Total SMART SCALE request: $11,658,000
- Request funded with DGP funds

- Original scope included:
  - Construct a new two-lane roadway and multi-use path
  - Construct new intersection at Route 17
- Project is VDOT administered
  - Current estimate: $16,302,392 representing a $4,643,391 shortfall
  - Advertisement scheduled for September 2024
  - Current expenditures: $1,148,741 (2/24/2022)

Project Location

Funding Shortfall

Major Factors Contributing to Funding Shortfall

- Additional preliminary engineering requirements
  - Significant resources directed to completion of required Location Study and identification of a Least Environmentally Damaging Practicable Alternative
- Higher than anticipated right-of-way and utility impacts
- Unit prices (from 2015 application) not in line with current trends

Efforts Taken to Reduce Costs

- Reduced typical section from 4 to 2 lanes and reduced shared use path width
- Reduced footprint at two new intersections
- Isle of Wight will acquire a portion of the right-of way

Funding Shortfall

Major Factors Contributing to Funding Shortfall	Approximate Cost
• Additional preliminary engineering requirements • Completion of required Location Study drove alignment and resulted in significantly different impacts	$0.3 M
• Higher than anticipated right-of-way and utility impacts	$5.8 M
• Unit prices (from 2015 application) not in line with current trends	$3.0 M
Sub-total Added Costs	**$9.1 M**
Efforts Taken to Reduce Cost	**Approximate Savings**
• Reduced typical section from 4 to 2 lanes and reduced shared use path width	-$2.9 M
• Reduced footprint at two new intersections	-$1.0 M
• Isle of Wight will acquire a portion of the right-of way	-$0.6 M
Sub-total Savings	**-$4.5 M**
Remaining Shortfall	**$4.6 M**

Project Budget Increase

Current Estimated cost $16.3M

- Total shortfall of $4.6M
- Isle of Wight committed $2.2M in local funding in November 2021
- FHWA approved addition of $0.4M in repurposed earmarks
- Sufficient unallocated Hampton DGP funds are available to cover the remaining shortfall of $2.0M

	Original Application	Current
Total $	$11.7M	$16.3M
Other Funding	$0	$2.2M Isle of Wight $0.4M Repurposed Earmark
SMART SCALE $	$11.7M (DGP)	$14.1M (increase of $2.0M)
Score	1.3	1.1 (based on original benefits)
Funding Scenario	17/21	17/21 (project would still have been funded)
Expenditures as of 2/24/22		$1.1M

Recommendation for Action in April 2022

Approve budget increase request

- Fund increase from unallocated Construction District Grant balances

Hampton Roads Construction District Grant Funds	Amount Available
Total Available	$2,156,472
Transfer for Budget Increase	$2,058,225
Balance Remaining	$98,247


VDOT
Virginia Department of Transportation

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4. Preliminary FY 2023 – 2028 Commonwealth Transportation Fund Six-Year Financial Plan
   Laura Farmer, Virginia Department of Transportation

This presentation is currently unavailable.

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5. Legislative Update
   Jo Anne Maxwell, Virginia Department of Transportation

This item does not have a presentation associated with it, there will be handout at the meeting.

# # #