COMMONWEALTH of VIRGINIA

Office of the

SECRETARY of TRANSPORTATION

CTB Update
SMART SCALE Round 4
and
Performance Based Planning Demo
Summary

● Update on current round of SMART SCALE

● Update on Performance Based Planning Pilots
  ○ NOVA
  ○ Culpeper
  ○ Salem
SMART SCALE Round 4

- 484 pre-applications submitted
  - Includes 2 placeholder for CTB
  - $7.5B total project cost

<table>
<thead>
<tr>
<th>District</th>
<th>Total Cost (millions)</th>
<th># of pre-apps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bristol</td>
<td>$156.6</td>
<td>35</td>
</tr>
<tr>
<td>Culpeper</td>
<td>$389.8</td>
<td>42</td>
</tr>
<tr>
<td>Fredericksburg</td>
<td>$500.5</td>
<td>41</td>
</tr>
<tr>
<td>Hampton Roads</td>
<td>$1,311.3</td>
<td>62</td>
</tr>
<tr>
<td>Lynchburg</td>
<td>$328.2</td>
<td>33</td>
</tr>
<tr>
<td>Northern Virginia</td>
<td>$3,084.4</td>
<td>45</td>
</tr>
<tr>
<td>Richmond</td>
<td>$937.6</td>
<td>98</td>
</tr>
<tr>
<td>Salem</td>
<td>$571.1</td>
<td>66</td>
</tr>
<tr>
<td>Staunton</td>
<td>$227.4</td>
<td>62</td>
</tr>
</tbody>
</table>
Round 4 Pre-Application Stats
Primary Request Type

• **Principal Improvement Type**
  – Highway: 365
  – Bike/Pedestrian: 96
  – Bus Transit: 14
  – Rail Transit: 2
  – Rail Freight: 1
  – TDM: 6
SMART SCALE Round 4

- No significant issues during pre-app period
- Pre-screening is underway
  - Keys Questions - Does the project meet:
    - VTrans need,
    - Eligibility requirements, and
    - Readiness requirements
- Final full application opens June 19th with submission deadline of August 3rd
Round 4 Flexibility

- Impact of COVID-19
- Need for flexibility on deadlines related to:
  - Resolutions of support
  - Documentation for leveraged funding
Performance-Based Planning Demo

- Performance based programming
  - SMART SCALE
  - SGR
  - HSIP

- Performance Based Planning/Project Development
  - Rethinking how to solve transportation problems
  - District/DRPT/OIPI examined projects from Round 3 of SMART SCALE to identify candidates - identified projects in Culpeper, NOVA and Salem
Performance-Based Planning

Does this decision tree make sense?

New Engine

New Car
Performance-Based Planning

Or is this more logical...

Understand the problem

Develop/Test Solutions
Fairfax County - Braddock Road Phase 1

- Strong project focused on multi-modal improvements
- Included multiple intersection improvements
- Achieved strong Safety, Accessibility, and Environmental Scores
- Low congestion score
- Round 3 request of $79.9M
Fairfax County - Braddock Road Phase 1

- Assessed areas driving higher costs and reduced benefits
- Identified alternatives that met needs through equal or better options - with reduced impacts and costs
- Projected to reduce cost by 15-20% and significantly increase congestion mitigation score
Prince William County - Prince William Parkway at Sudley Manor Drive & Wellington Road

- Next intersection downstream from Ball’s Ford intersection
- High traffic & congestion area
- Initial Round 3 project included two grade separations with a Single Point Urban Interchange
- Gas line impacts
- Total cost over $177M
Prince William County - Prince William Parkway at Sudley Manor Drive & Wellington Road

- Assessed alternative ways to meet the purpose/need of original project
- Developed alternatives that lower cost while still achieving long term benefit and congestion mitigation
- Projected to reduce cost 30-40% and shorten construction time
- Eliminate two signals on PWP
Loudoun County - US-15 Lucketts Area

- High priority safety and congestion area
- Context sensitivity to village/local environment with school and historic considerations - RW constraints
- Strong need for improvements - safety and congestion
- Current long-term solution is to bypass Lucketts
Loudoun County - US-15 Lucketts Area

- Working with District and County on options to reduce costs and impacts while addressing congestion/safety
- Quadrant roadway under evaluation
- Reduced signal phases and conflict points
- Opportunity to relocate school access to quadrant roadway
Performance-Based Planning
Loudoun County - US-15 Lucketts Area

AM Peak Hour Queue Lengths Across the Corridor
2030 No Build vs. 2030 QRI

- Decrease in average AM queues
  - 21%
- Decrease in maximum AM queues
  - 54%

Comparing 2030 No Build to the 2030 QRI concept

PM Peak Hour Queue Lengths Across the Corridor
2030 No Build vs. 2030 QRI

- Decrease in average PM queues
  - 48%
- Decrease in maximum AM queues
  - 36%

Comparing 2030 No Build to the 2030 QRI concept
Performance-Based Planning
Route 28 - Centreville Road

Centreville Road (VA 28) - between Prince William / Fairfax County line at the bridge over Bull Run and Blooms Quarry Lane / Old Centreville Road intersection at the Prince William County / City of Manassas Park line

- High traffic volumes: 2,500-2,700 vehicles per hour in northbound in AM and southbound in the PM
- 100 driveways over 2 miles
- 5 lane cross-section with center two-way left turn only lane
Performance-Based Planning
Route 28 - Centreville Road

Summary of Reported Crashes within Centreville Road Study Area Limits From 2013 through 2018

- Average Annual Crash Rates between 2013 and 2018 ranged from 193 to 242 crashes per 100 million vehicle miles.
  - 50 to 78% higher than Average Annual Crash Rates for Primary Highways in VDOT NOVA District.
  - 50 to 88% higher than Statewide Average Rates
Performance-Based Planning
Route 28 - Centreville Road

Route 28 Bypass
Total Cost: $300M
Existing funding $95M in NVTA funds
Concerns with cost, environmental impacts, ROW impacts, constructability, neighborhood impacts, alignment

Even with a bypass, the existing roadway needs improvements for mobility and safety
Performance-Based Planning
Route 28 - Centreville Road

- Orchard Bridge Drive
- Yorkshire Lane
- Leland Drive

Able to reduce signal phases and give more time to through traffic

Reduction in conflict points leads to improved safety
Performance-Based Planning
Route 28 - Centreville Road

Significant reduction in delay and increase in throughput

Maplewood Drive

Browns Lane

50% reduction in fatal and injury crashes

Current estimate between $30-40M
Performance-Based Planning
Route 460 - Orange Avenue

**Background**
- 4.8 mile Arterial Preservation effort led by Salem District
- 36 intersections
  - 12 signals
  - 1 emergency
  - 16 unsignalized
  - 7 crossovers
- Round 3 project to widen to 6 lanes from Hollins to Gus Nicks
- Round 3 cost - $77M

**Challenge:** Preserve existing capacity and get 6-lanes of performance on existing 4-lane facility
Performance-Based Planning
Route 460 - Orange Avenue

50% reduction in delay and improved safety due to signalizing the weave from I-581
Performance-Based Planning
Route 460 - Orange Avenue

44% reduction in delay
78% reduction in conflict points
Performance-Based Planning
Route 460 - Orange Avenue

37% reduction in delay
52% reduction in intersection conflict points
Performance-Based Planning
Route 460 - Orange Avenue

West Ruritan Road

36% reduction in delays; 25% reduction in conflict points

East Ruritan Road

53% reduction in conflict points
Performance-Based Planning
Route 460 - Orange Avenue

2040 As Proposed

- **27% reduction** in AM peak delay
- **37% reduction** in PM peak delay
- **38% reduction** in conflict points which will reduce crashes

Current SMART SCALE applications cover 25 study intersections estimates at $40M
Performance-Based Planning
Route 29 / Hydraulic Road

**Background**

- A **$200M** package was applied for in SMART SCALE Round 3 to address the Route 29 / Hydraulic Road intersection
  - Route 29 / Hydraulic Partial Grade Separation
  - Zan Road Overpass, Hillsdale Drive Extended, Relocated 250 WB Off Ramp and Overpass from Angus Road to Holiday Drive
- Projects did not score well in Round 3
- VDOT District Planning led an effort to cost solution
- **$18M** in funds available to leverage to solutions
Performance-Based Planning
Route 29 / Hydraulic Road

2040 PM peak
- 15% delay and 40% conflict point reduction at Route 29 / Hydraulic
- 45% delay and 75% conflict point reduction at Route 29 / Angus Road
- 60% delay and 80% conflict point reduction at Hydraulic Road / Hillsdale Road

Revised solution package estimated at $25M
Transportation as a System
Assembly Line Illustration

Each station can process
100 widgets per hour

Station 1
Station 2
Station 3

100 widgets completed per hour

Finished Widgets
Transportation as a System
Assembly Line Illustration

Station 1 upgraded and can now process 200 widgets per hour

Station 1

Station 2

Station 3

Viewed as a System:
0% improvement in system output

Viewed as a project:
100% improvement in Station 1 output

Finished Widgets
All 3 stations upgraded to process 125 widgets per hour

**Viewed as a System:** 25% improvement in system output

Station 1  Station 2  Station 3
Questions