



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

| District | Total Cost (millions) | # of pre-apps |
|-------------------|-----------------------|---------------|
| Bristol | \$ 156.6 | 35 |
| Culpeper | \$ 389.8 | 42 |
| Fredericksburg | \$ 500.5 | 41 |
| Hampton Roads | \$ 1,311.3 | 62 |
| Lynchburg | \$ 328.2 | 33 |
| Northern Virginia | \$ 3,084.4 | 45 |
| Richmond | \$ 937.6 | 98 |
| Salem | \$ 571.1 | 66 |
| Staunton | \$ 227.4 | 62 |

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

Success here depends on...

effort here

- 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



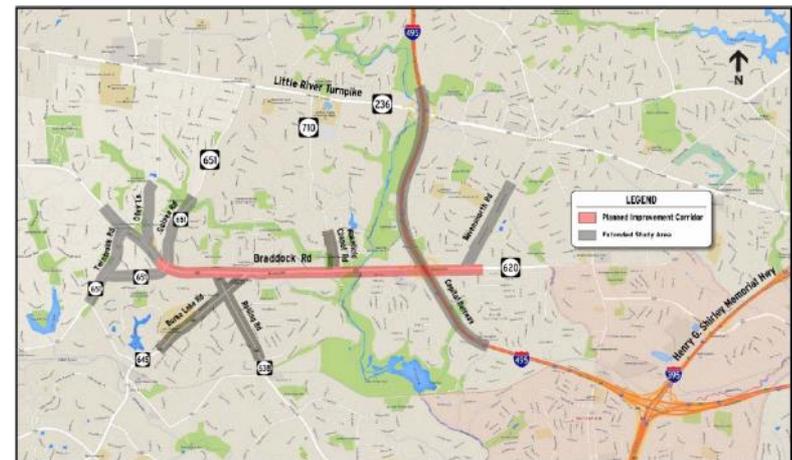
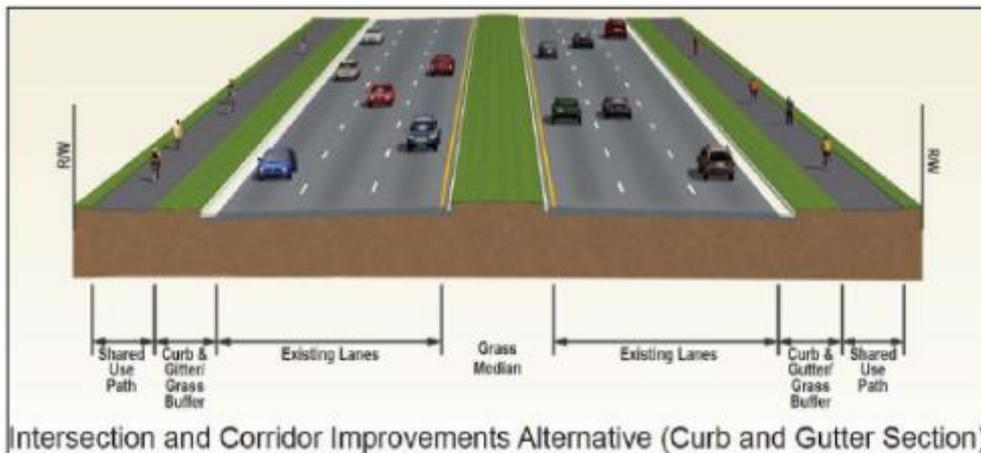
Performance-Based Planning

Fairfax County - Braddock Road Phase 1



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**



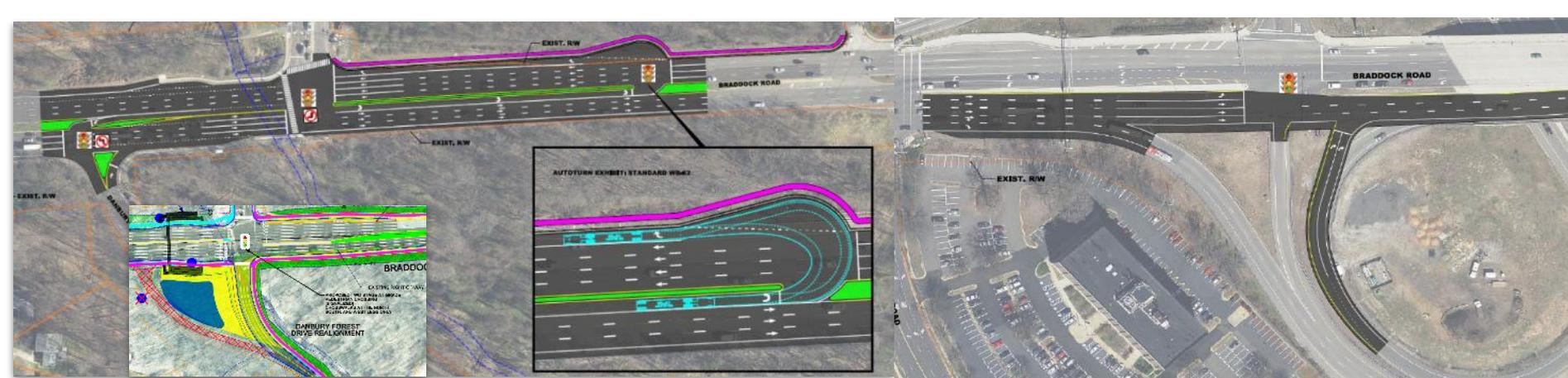
Performance-Based Planning

Fairfax County - Braddock Road Phase 1



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**



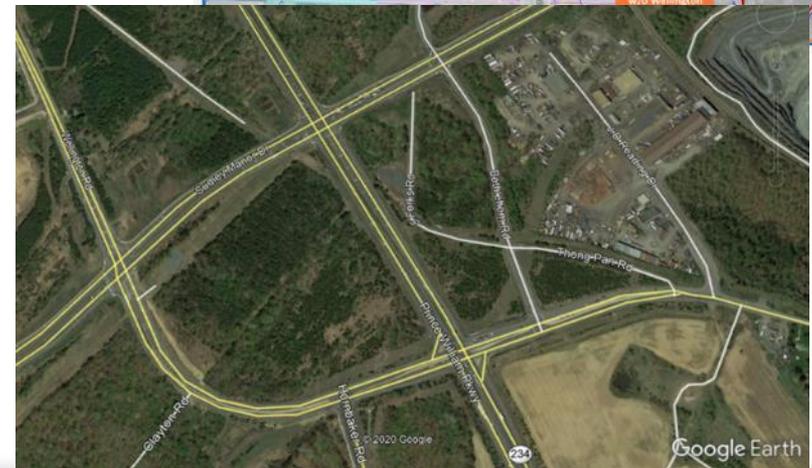
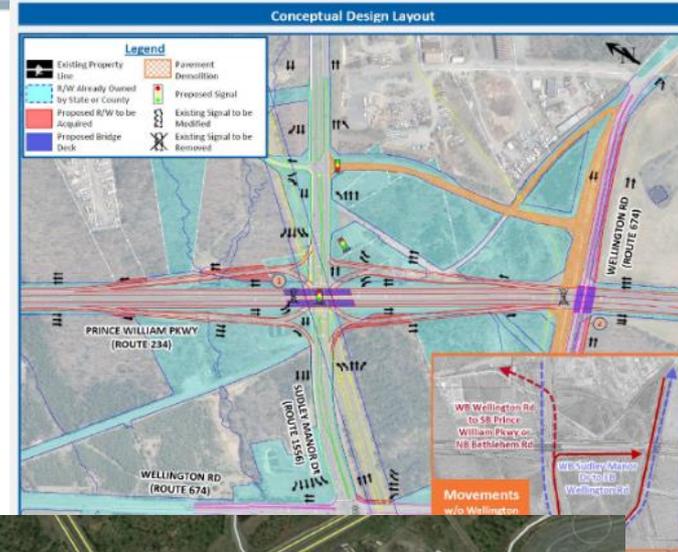
Performance-Based Planning

Prince William Parkway at Sudley Manor Drive & Wellington Road



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**



Performance-Based Planning

Prince William Parkway at Sudley Manor Drive & Wellington Road



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



Performance-Based Planning

Loudoun County - US-15 Lucketts Area



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



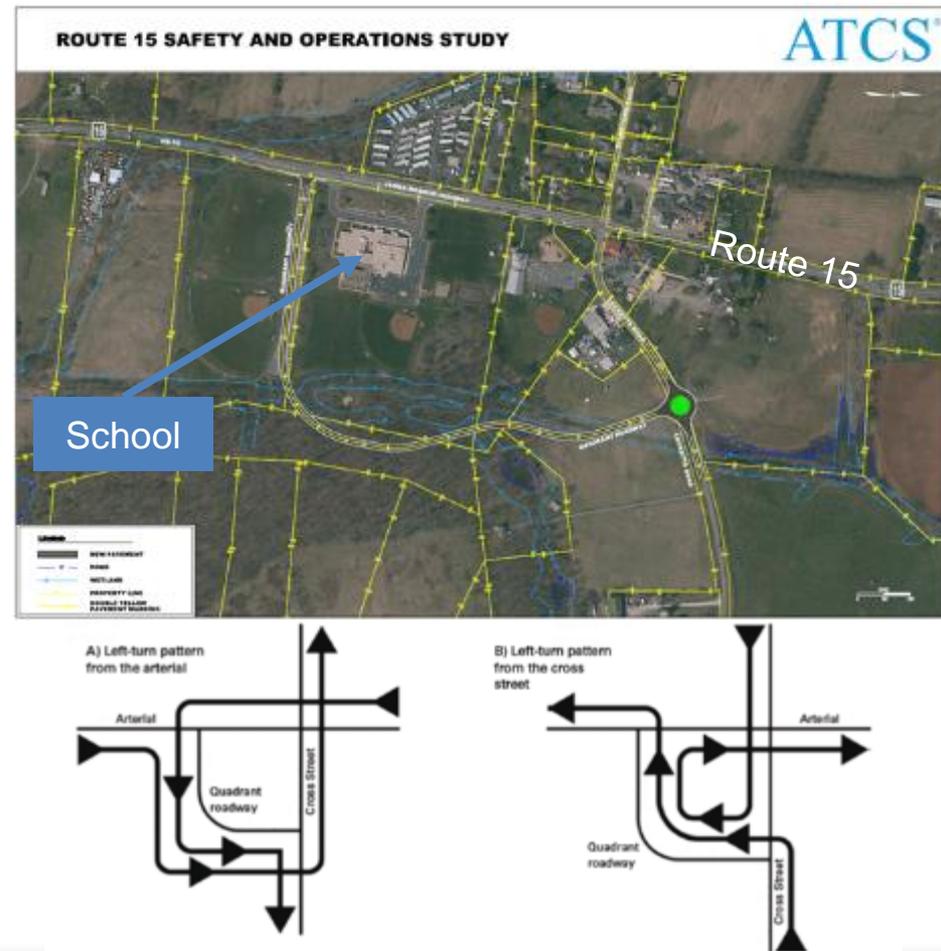
Performance-Based Planning

Loudoun County - US-15 Lucketts Area

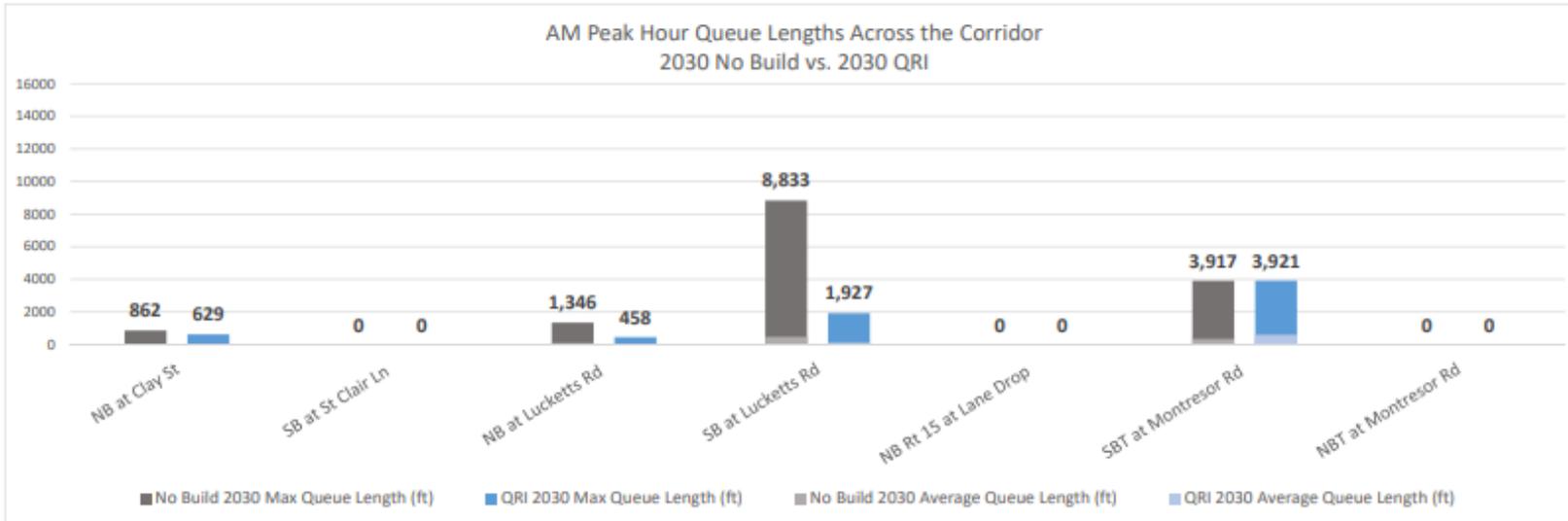


Loudoun County - US-15 Lucketts Area

- 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



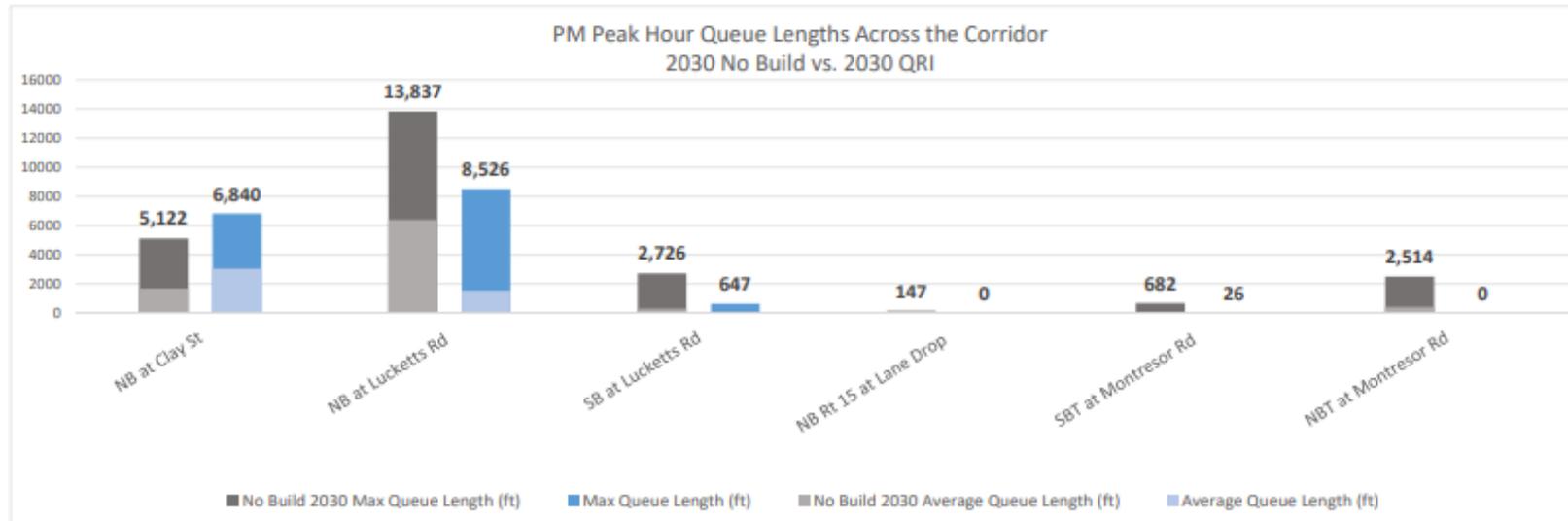
Decrease in average AM queues

21%

Decrease in maximum AM queues

54%

Comparing 2030 No Build to the 2030 QRI concept



Decrease in average PM queues

48%

Decrease in maximum AM queues

36%

Comparing 2030 No Build to the 2030 QRI concept

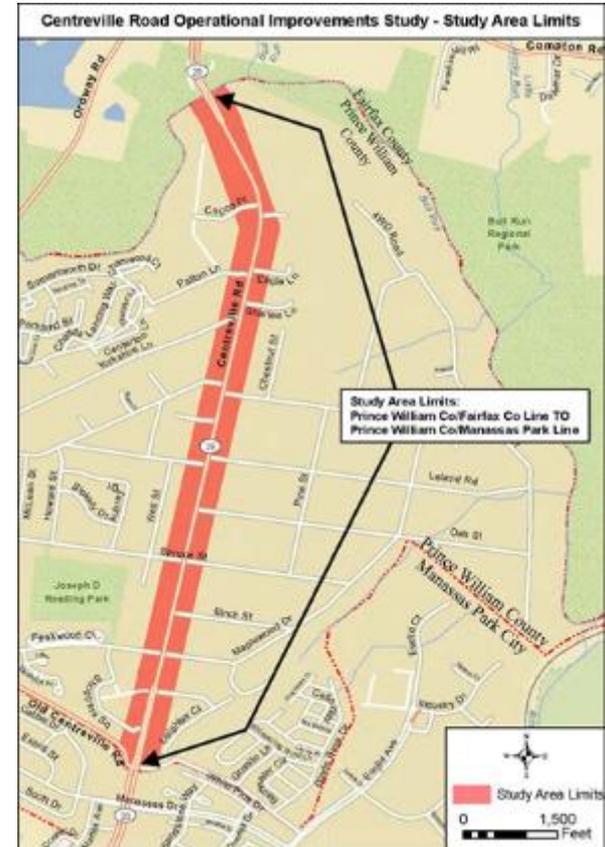
Performance-Based Planning

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

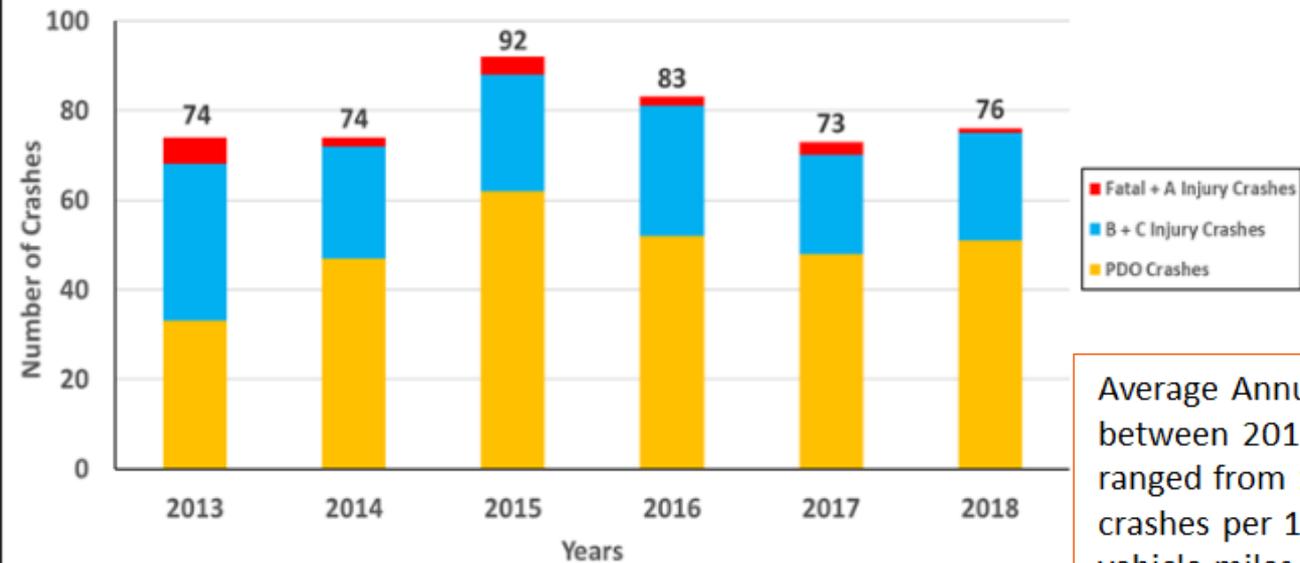
- High traffic volumes: 2,500-2,700 vehicles per hour in northbound in AM and southbound in the PM
- 100 driveways over 2 miles
- 5 lane cross-section with center two-way left turn only lane



Performance-Based Planning

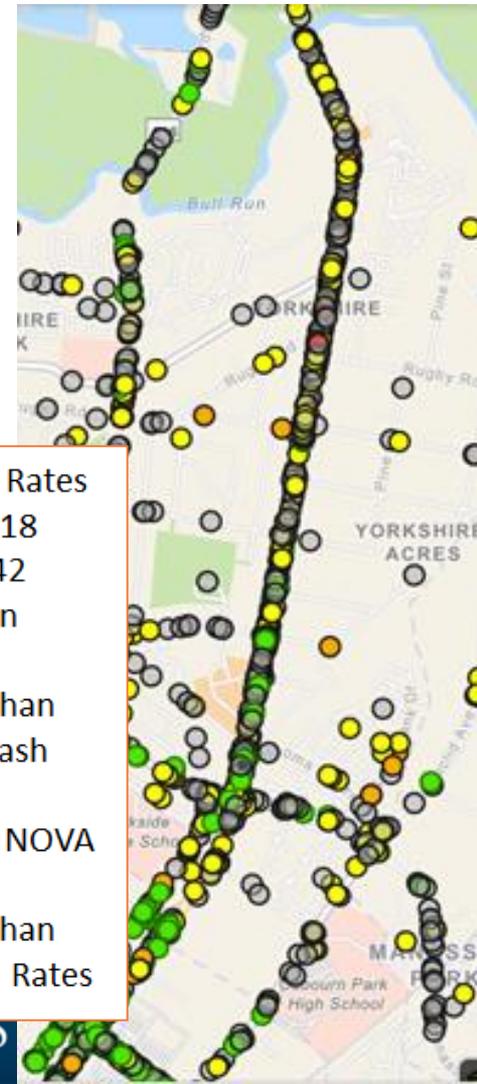
Route 28 - Centreville Road

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

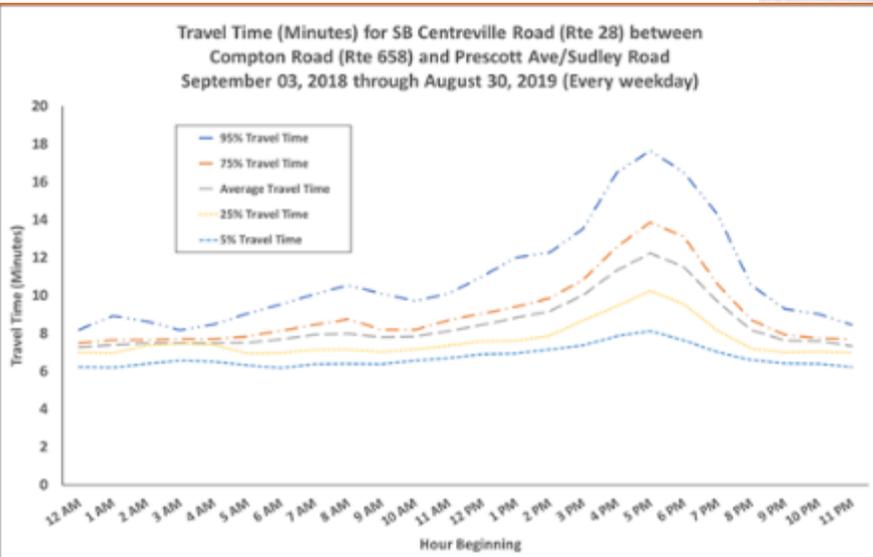
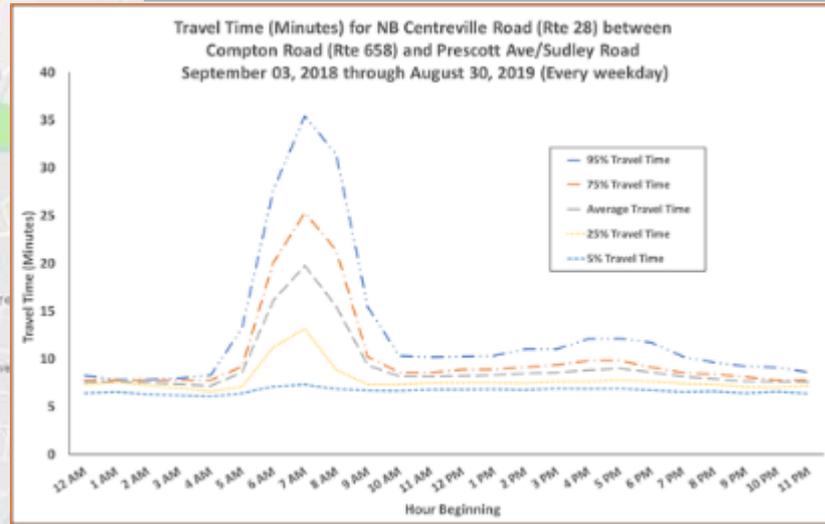
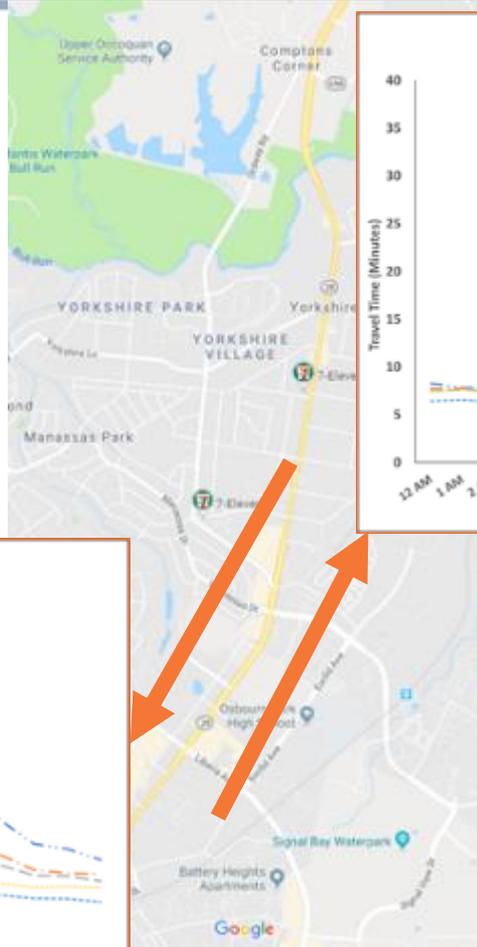


Route 28 Bypass

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

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

Yorkshire Lane

Fire Station off Patton Ln
(further west)

EMERGENCY VEHICLE
CROSS OVER

Leland Drive

Reduction in
conflict points
leads to improved
safety

Performance-Based Planning

Route 28 - Centreville Road



Significant reduction in delay and increase in throughput

50% reduction
in fatal and injury
crashes

Current estimate
between **\$30-40M**

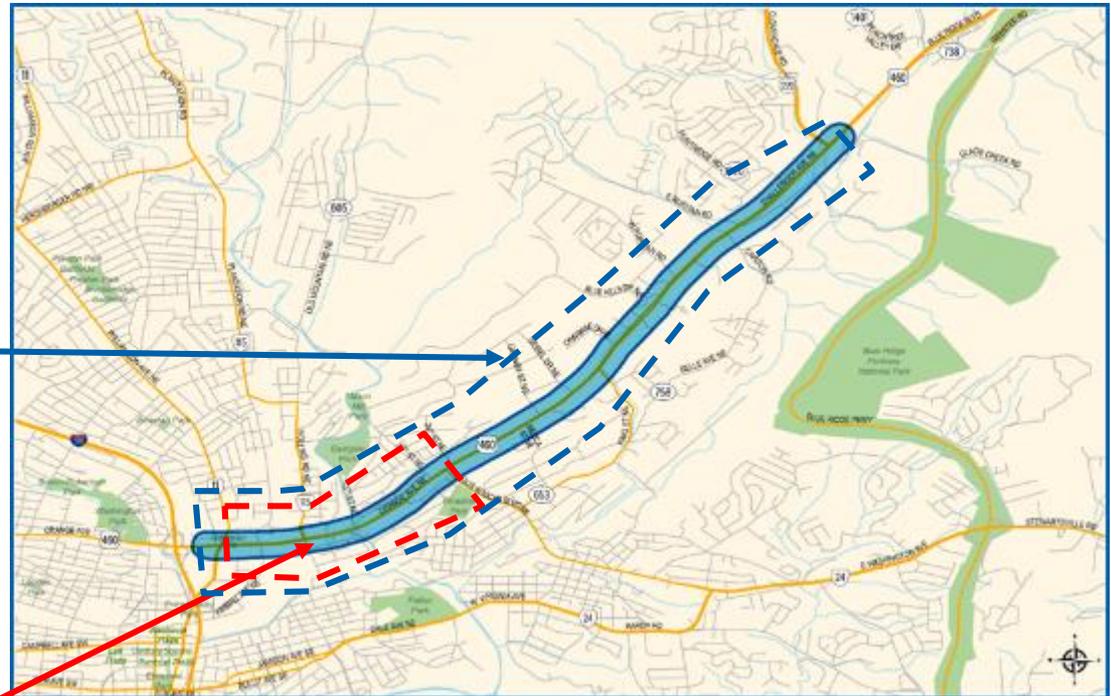


Performance-Based Planning

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 signaling 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



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

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



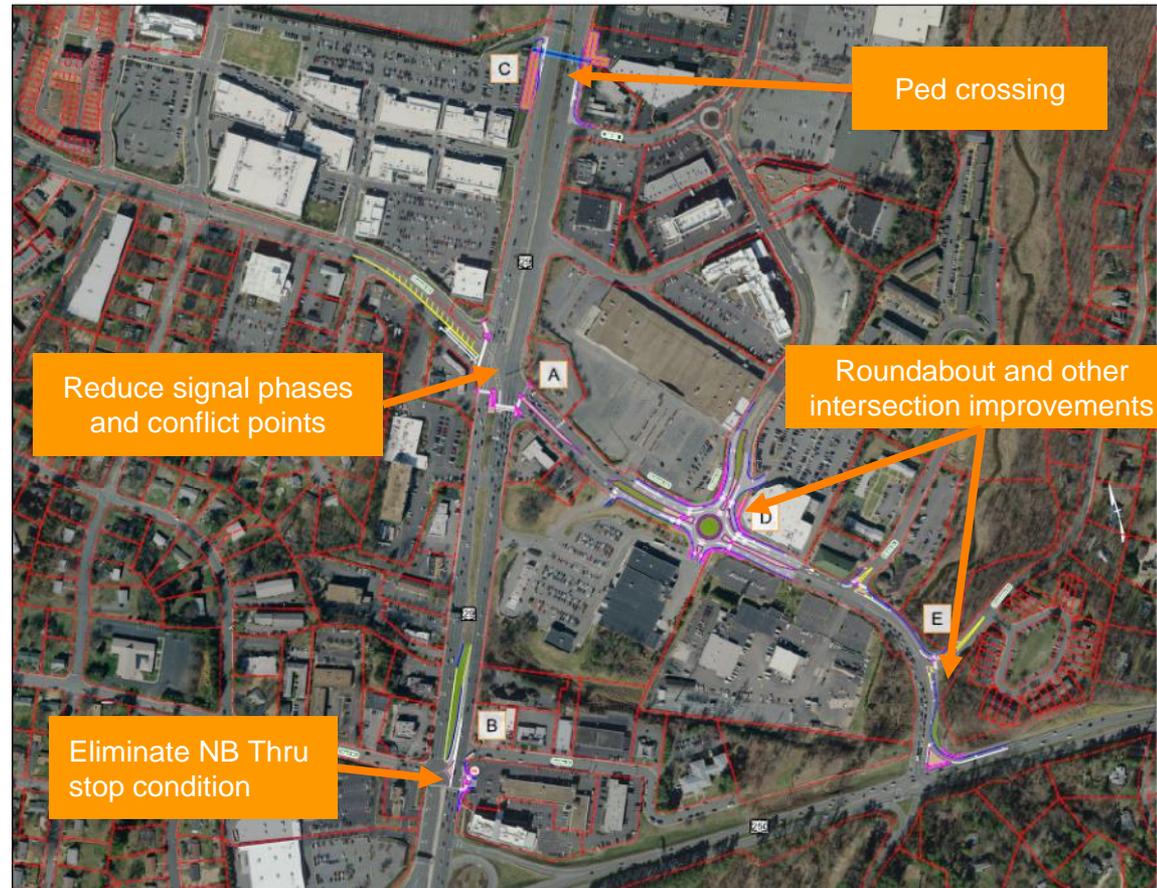
Performance-Based Planning

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

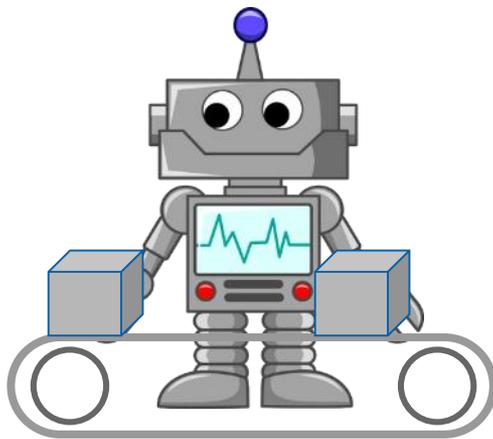
**Revised solution package
estimated at \$25M**



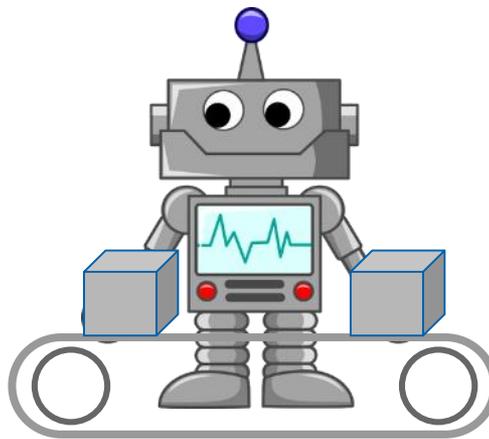
Transportation as a System

Assembly Line Illustration

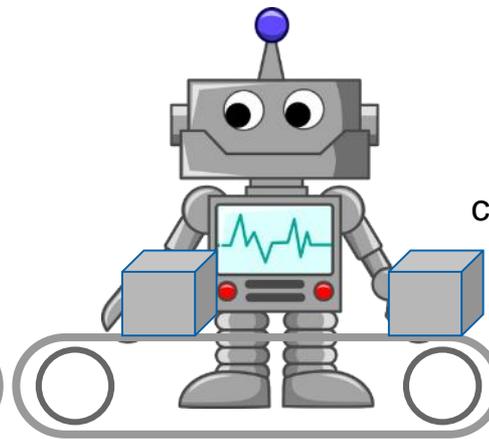
Each station can process
100 widgets per hour



Station 1

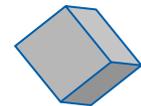


Station 2



Station 3

100 widgets
completed per hour

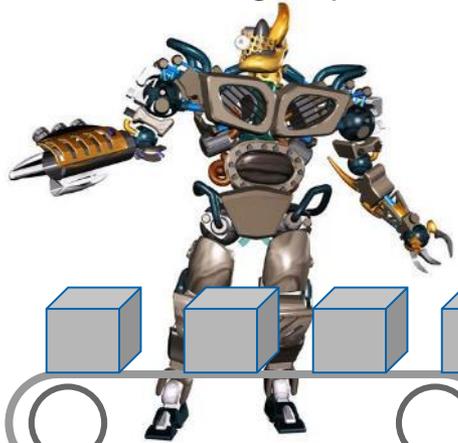


Transportation as a System

Assembly Line Illustration

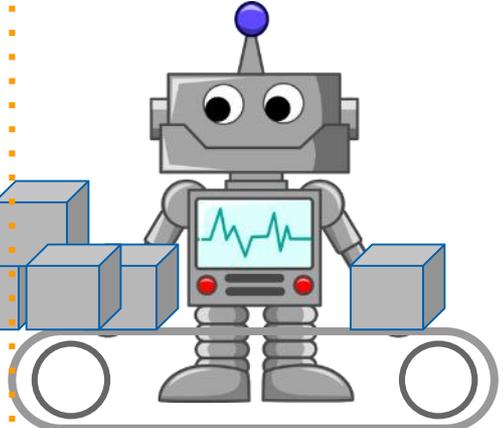
Alternative 1

Station 1 upgraded and can now process 200 widgets per hour

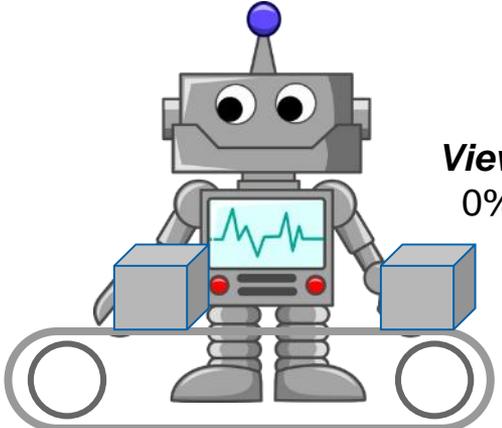


Station 1

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

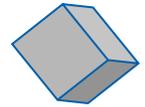


Station 2



Station 3

Viewed as a System:
0% improvement in
system output

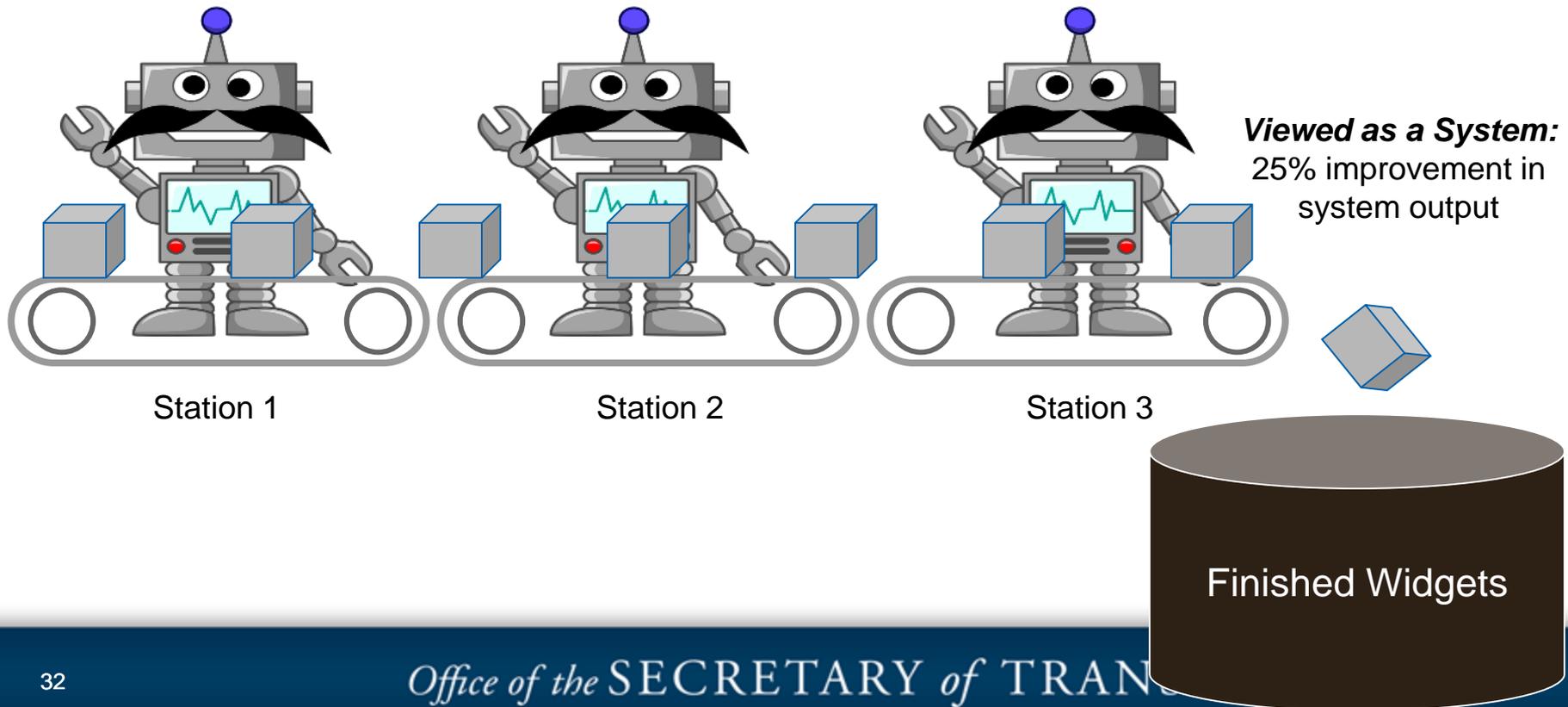


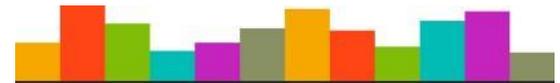
Transportation as a System

Assembly Line Illustration

All 3 stations upgraded to
process 125 widgets per hour

Alternative 2





**SMART
SCALE**

*Funding the Right
Transportation Projects
in Virginia*

Questions