
VDOT
Virginia Department of Transportation

STATE OF SAFETY PROGRAMS IN VIRGINIA

Working to Drive Deaths and Serious Injuries Towards Zero on Our Highways

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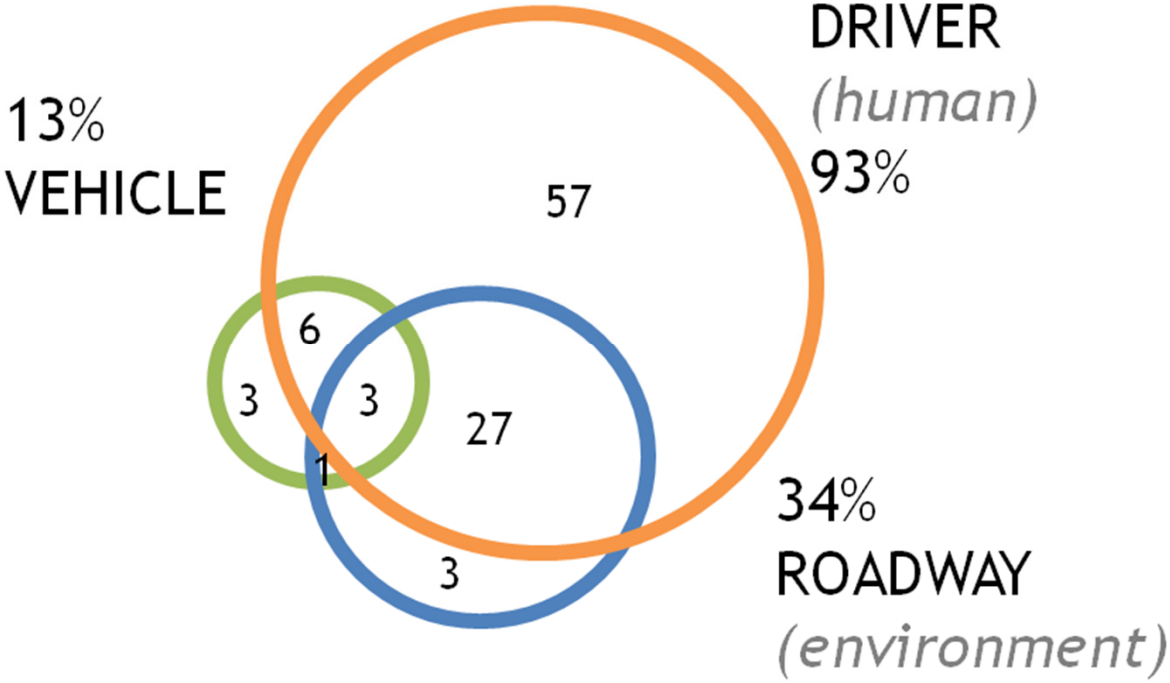
Outline

1. Severe Crash Factors Affecting Safety Performance
2. Virginia's Safety Programs
3. SMART SCALE Prioritization Safety Considerations
4. What does the future safety performance look like?

Crash Causation Factors

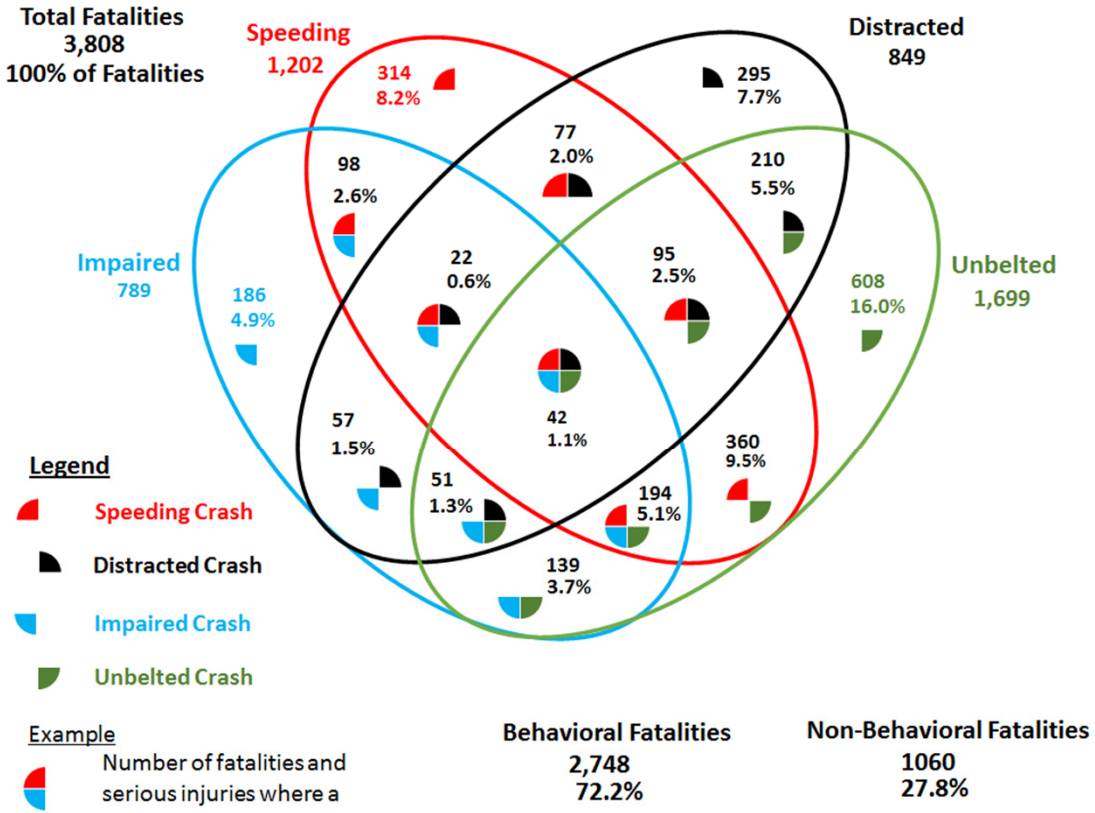
Driving, riding and walking actions include:

- **Inattention**
- **Following too close,**
- **Poor perception of speed, distance, gap**
- **Inappropriate/unlawful behavior**
- **Etc…..**



Treat, 1979

Major User Behaviors in over 70% of Fatalities



2013-17 Fatalities

Improving user behaviors remain a critical component to reducing severe crashes and their outcome.

Detailed Assessment of Intersection Crash Improvements

Assessment of "four behaviors" in sample of fatal and serious injury intersection related crashes revealed:

- **Decreased expected FATAL crash reductions from infrastructure improvements by 33 to 50 percent**
- **Decreased expected SERIOUS INJURY crash reductions from infrastructure improvements by 20 to 30 percent**

Range is based on low, medium and higher cost intersection improvements

Virginia's Highway Safety Programs

2017-21 Strategic Highway Safety Plan contains Countermeasures and Actions for:

- Pedestrians and Bicyclists
- Intersections / Interchanges
- Roadway Departures
- Young Drivers
- Impaired Drivers
- Speeding
- Unbelted Occupants
- Incident Response and Management
- Connected & Automated Vehicles

Virginia's Highway Safety Programs

VDOT Highway Safety Improvement Program:

- **Implements safety targeted and cost effective infrastructure treatments**

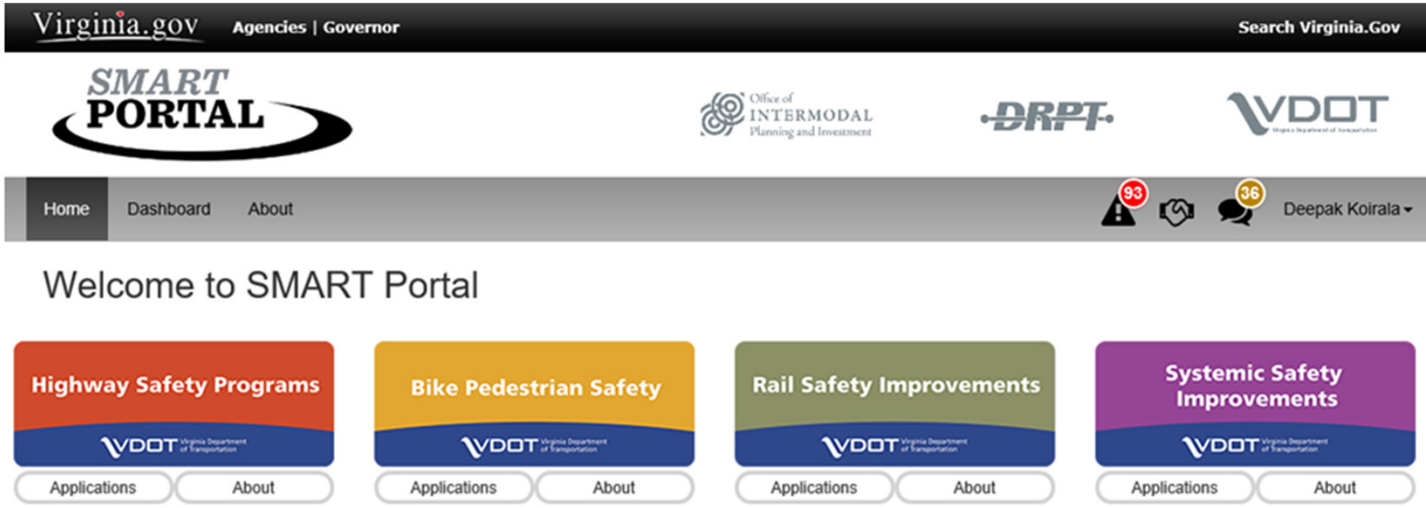
DMV Highway Safety Plan:

- **Implements behavioral educational and enforcement activities**

HSIP Focus Areas

Intake of Improvement Proposals:

- Highway Spots/Corridors
- Systemic Locations
- Bike / Ped
- Rail Crossings



Identifying High Crash Locations

Locations with a Potential for Safety Improvement (PSI) are identified annually based on past 5 years of crashes and traffic volumes

Uses predictive analysis to find intersections and segments that experienced more crashes than would be anticipated (based on volume on roadway or intersection features/type)

Prioritizing Spot / Corridor Projects

Driven by reasonably low cost improvements with targeted severe crashes at high crash (PSI) locations

Scoring Card	Weight
Funded	>=75%
Waiting List	>=50% and <75%
Returned	<50%

Factor	Weight
B/C Ratio	40%
PSI Location	25%
High Number of Targeted Crashes	10%
Cost Estimate	5%
Project Schedule	5%
No Other Funding Sources	5%
Supporting Documents	5%
Location Mapped	5%

Systemic Improvements

Roadway Departures:

- Curve warning signs
- Better lane markings
- Rumble Strips
- High Friction Pavement

Intersections:

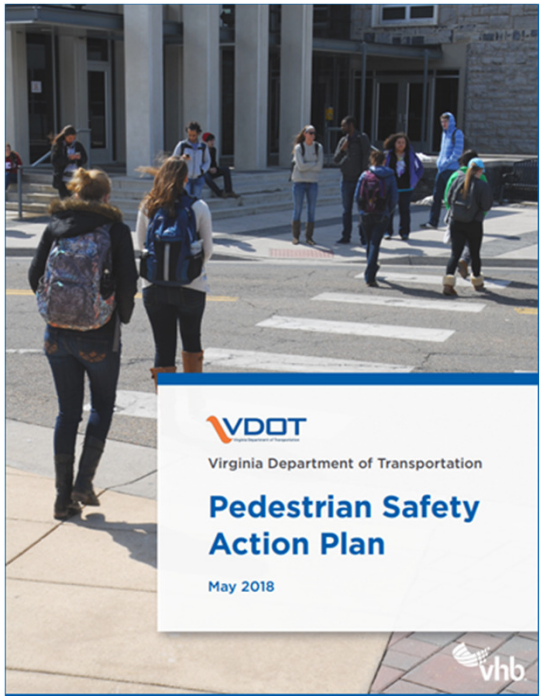
- Advance warning
- Reflective Backplates
- Flashing Yellow Arrow Signal
- LED Signals

Pedestrians and Bicyclists:

- Warning and crossing signing
- Crosswalk marking
- Ped Signals
- Flashing Beacons

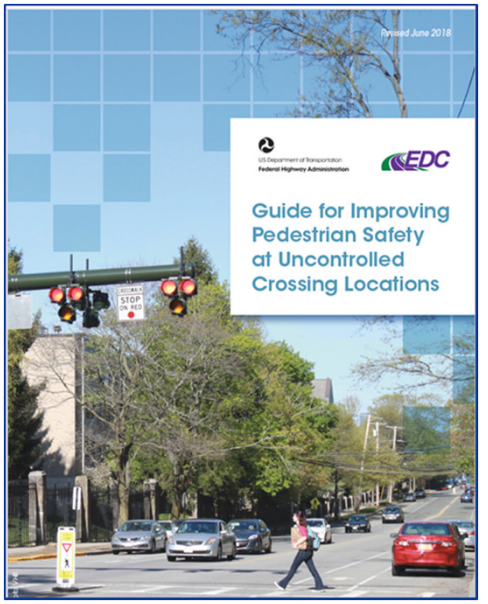
Low cost devices spread across the network

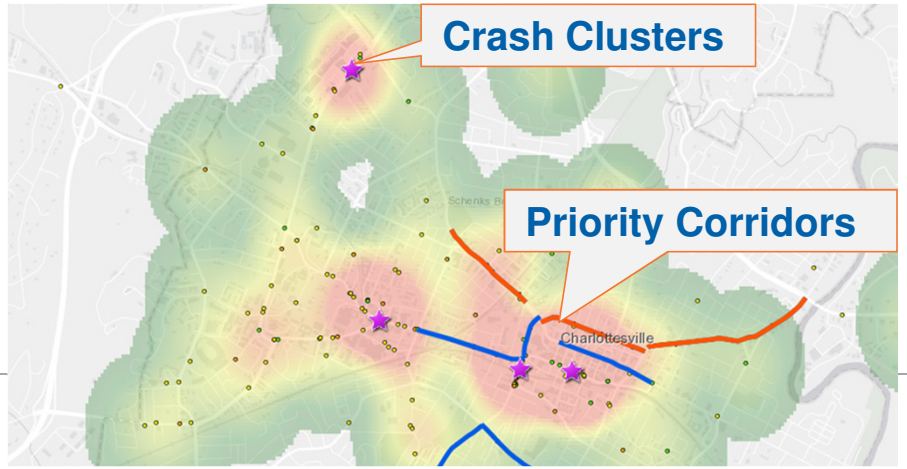
Systemic Bike and Ped



Identify target crash type and/or countermeasure with factors / environment contributing to risk

Prioritize locations based on mix of crashes and factors





Funded $1.6M projects in NoVA from $8M for 2019 deployment

HSIP Funding for NoVA

Currently Funded FY 2020 – 24 Projects

($Millions)

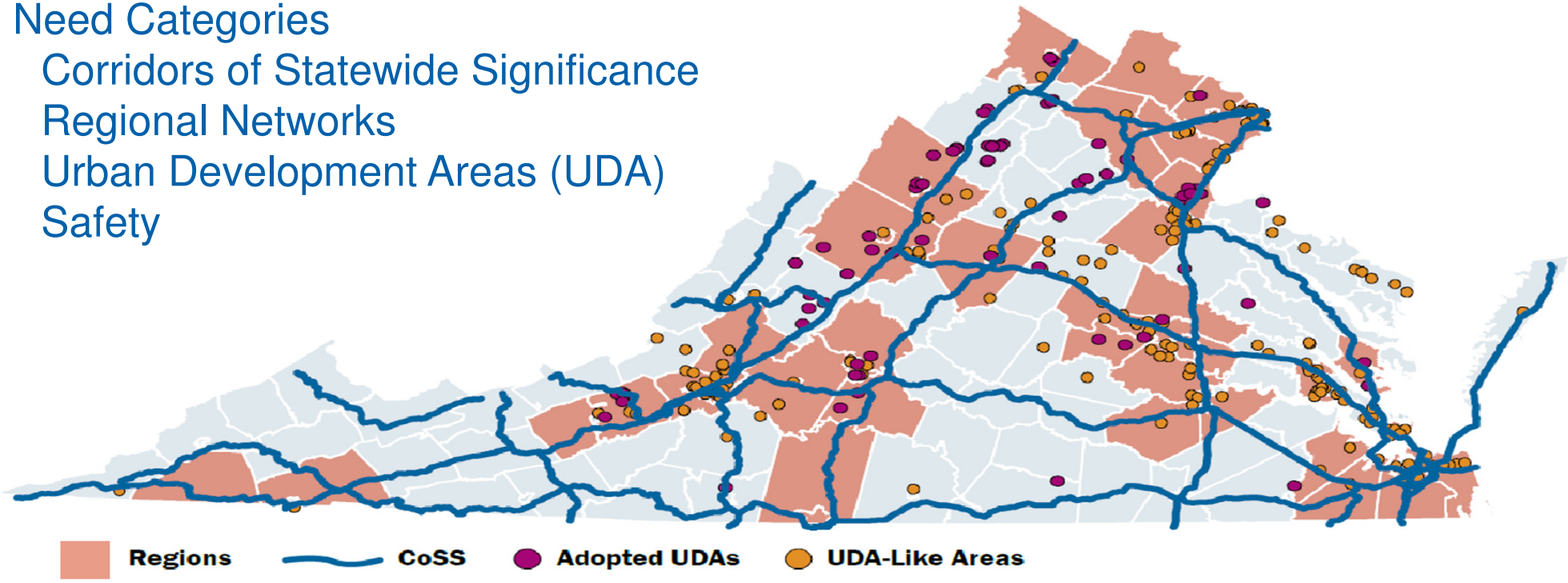
Owner	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Locality	1.15	0.31	0.79	0.99	1.07
VDOT	3.81	2.55	1.28	3.65	6.52
Grand Total	**4.96**	**2.86**	**2.07**	**4.64**	**7.59**

SMART SCALE
Funding the Right Transportation Projects in Virginia

VTrans - Needs Assessment

4 Need Categories

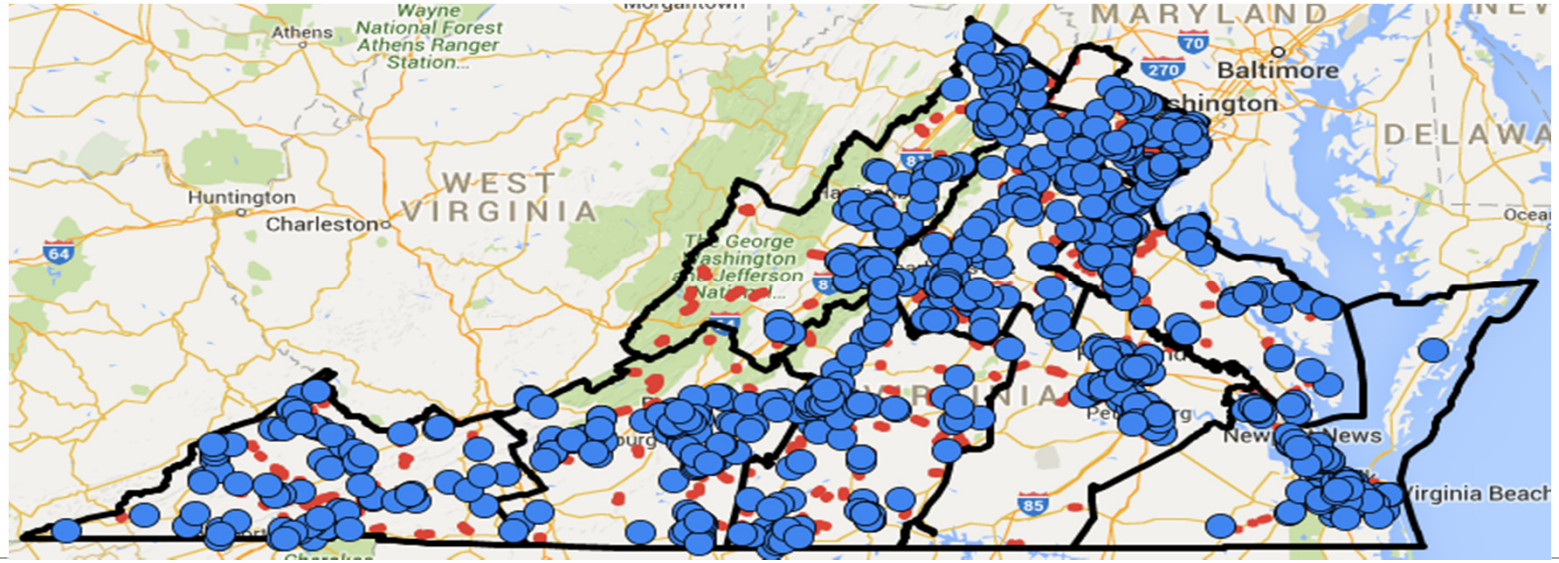
- Corridors of Statewide Significance
- Regional Networks
- Urban Development Areas (UDA)
- Safety



SMART SCALE
Funding the Right Transportation Projects in Virginia

SAFETY Needs

- Safety needs based on Potential for Safety Improvement (PSI) intersections and segments identified in each district, or
- Safety assessment of crash history or geometric deficiencies.



SMART SCALE
Funding the Right Transportation Projects in Virginia

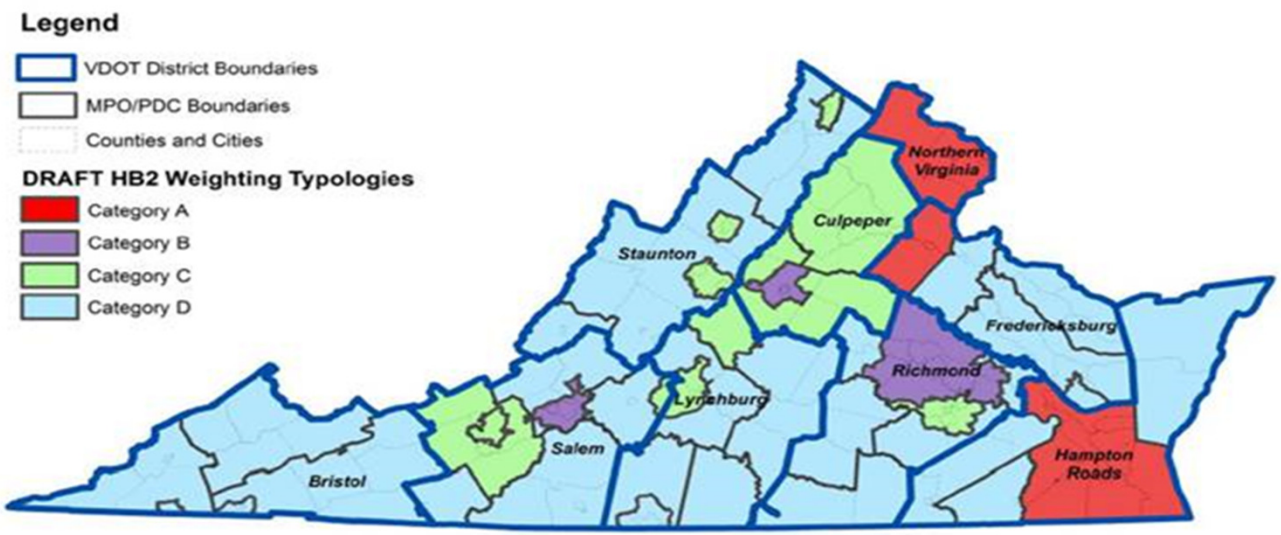
Measuring SAFETY Benefit

- 50% of score – Expected reduction in Equivalent Property Damage Only (EPDO) crash frequency (100% of score for transit projects)
- 50% of score – Expected reduction in EPDO crash rate per 100M VMT

– Convert crashes to EPDO
  - Cost based Weights
    - Fatal (K) - 85
    - Severe Injury (A) - 85
    - Minor Injury (B) - 10
    - Non-visible injury (C) - 5

SMART SCALE
Funding the Right Transportation Projects in Virginia

Area Type Weighting



Factor	Congestion Mitigation	Economic Development	Accessibility	Safety	Environmental Quality	Land Use
Category A	45%	5%	15%	5%	10%	20%
Category B	15%	20%	25%	20%	10%	10%
Category C	15%	25%	25%	25%	10%	
Category D	10%	35%	15%	30%	10%	

SMART SCALE | Funding the Right Transportation Projects in Virginia

SAFETY Benefits

– Reductions determined using published **Crash Modification Factors** for roadway improvements or **changes in VMT (build/no-build)** for Transit/TDM and New Alignment benefits

– Maximize expected reductions by:

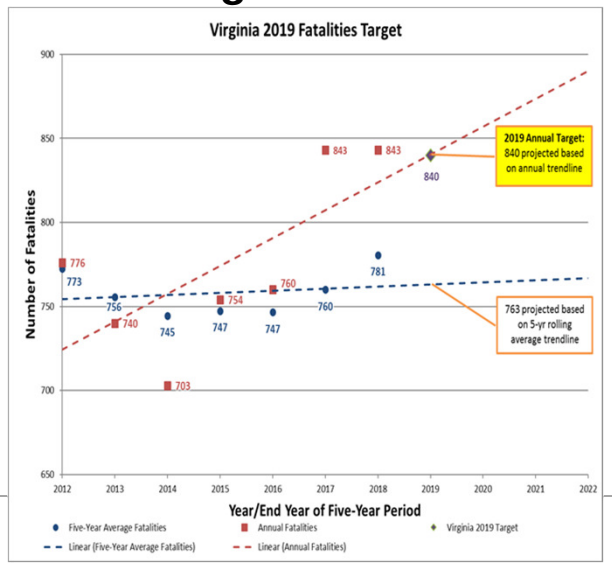
- **minimizing** user **conflict points** with innovative intersections, interchanges and driveway management
- providing **more "*forgiving*"** roadways with **non-motorized accommodations**

What does the future safety performance look like?

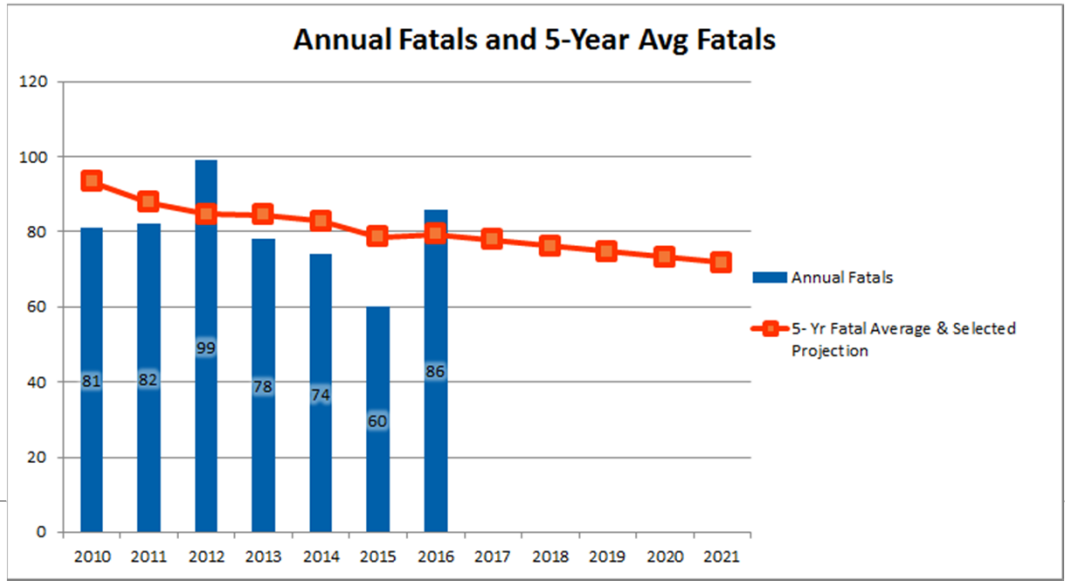
States and MPOs must now set targets for fatalities and serious injuries each year

Annual and five year average trends are not consistent

Virginia Fatalities

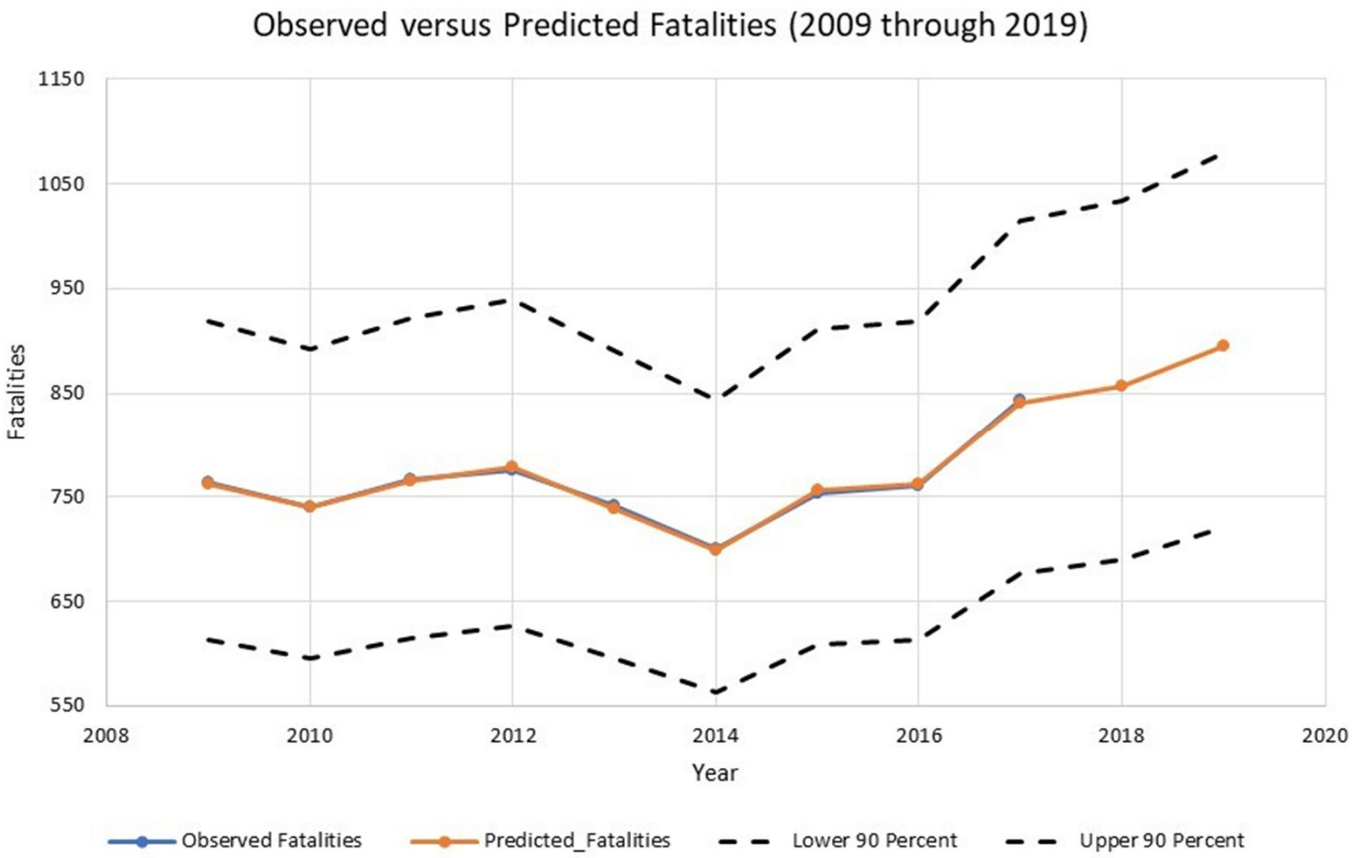


NoVA Fatalities



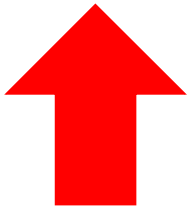
Improving Forecasting Methods

Developing prediction models at the VDOT District level based on Vehicle Miles Traveled and other significant factors



Initial Findings from Model Development

- Local, collector and minor arterial proportion of VMT increases severe crashes
- Increasing young population (15-24) increases severe crashes
- Increasing aging population (75 plus) increases severe crashes



- Increased snowfall in month decreases severe crashes
- Increasing rural VMT decreases non-motorized severe crashes

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