

# **VIRGINIA'S HIGHWAY SYSTEMIC SAFETY IMPLEMENTATION PLAN**

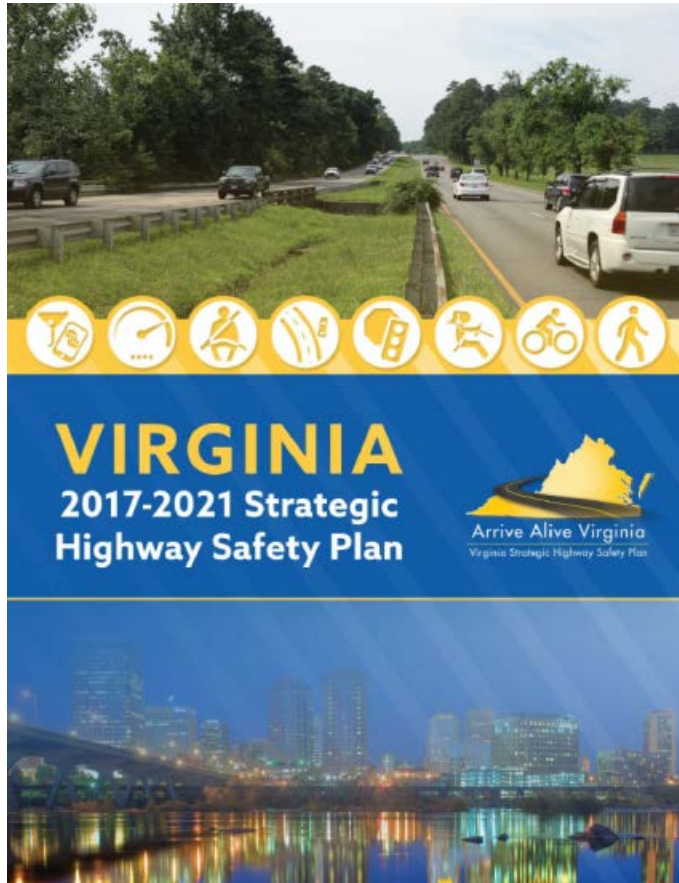
MWCOG Transportation Safety Subcommittee

 Stephen Read, PE, Virginia Department of Transportation

February 09, 2021

# ARRIVE ALIVE VIRGINIA

## Virginia Strategic Highway Safety Plan (SHSP)



### Vision

Toward Zero Deaths

### Mission

Save Lives and Reduce Injuries  
through 4E's of:



[http://www.virginiadot.org/info/resources/SHSP/VA\\_2017\\_SHSP\\_Final\\_complete.pdf](http://www.virginiadot.org/info/resources/SHSP/VA_2017_SHSP_Final_complete.pdf)

# 2017-2021 SHSP Emphasis Areas

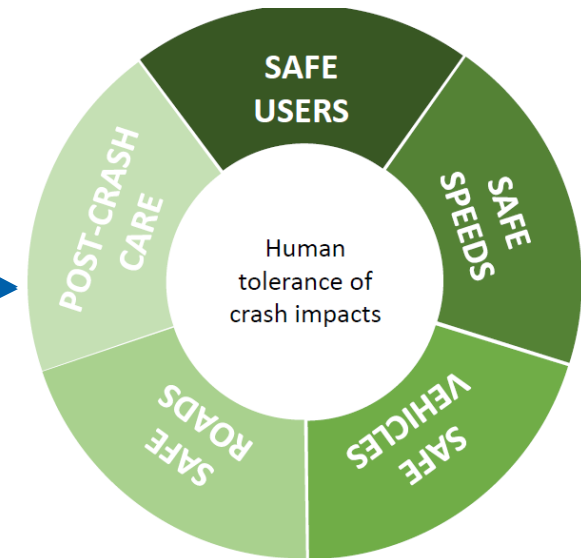
## Emphasis Areas

Roadway Departure  
Intersections  
Impaired Driving  
Occupant Protection  
Speed  
Young Drivers  
Pedestrians  
Bicyclists

## Special Safety Areas

EMS  
Connected / Autonomous  
Vehicles  
Data

Towards Safe Systems



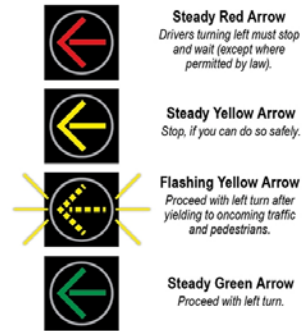
# 8 Systemic Safety Items

## High-visibility Backplates



Up to 15% crash reduction

## Flashing Yellow Arrow



Up to 20% crash reduction

## Curve Signs



Up to 40% crash reduction

## Pedestrian Crossings



Up to 56% crash reduction

## Unsignalized Intersections



Up to 10% crash reduction

## Shoulder Wedge



Up to 20% crash reduction

## Centerline Rumble Stripes



Up to 60% crash reduction

## Edgeline Rumble Strips



Up to 50% crash reduction

# Implementation Plan Development

- **Identified \$136.7M in potential funding through FY 2025 for a systemic safety plan**
- **Developed DRAFT plan to deploy 8 systemic safety countermeasures in Virginia**
  - All 8 countermeasures are lower-cost/high-benefit
  - All 8 countermeasures have proven safety results in Virginia or other states
- **\$20M of \$136.7M proposed to be set aside for local systemic projects in FY 2024 and 2025**
  - Amount for local roads is consistent with current formula which divides safety funds between VDOT and locally-maintained roads based on the proportion of traffic deaths on each system

# Implementation Plan for 8 Systemic Treatments on VDOT System Roads

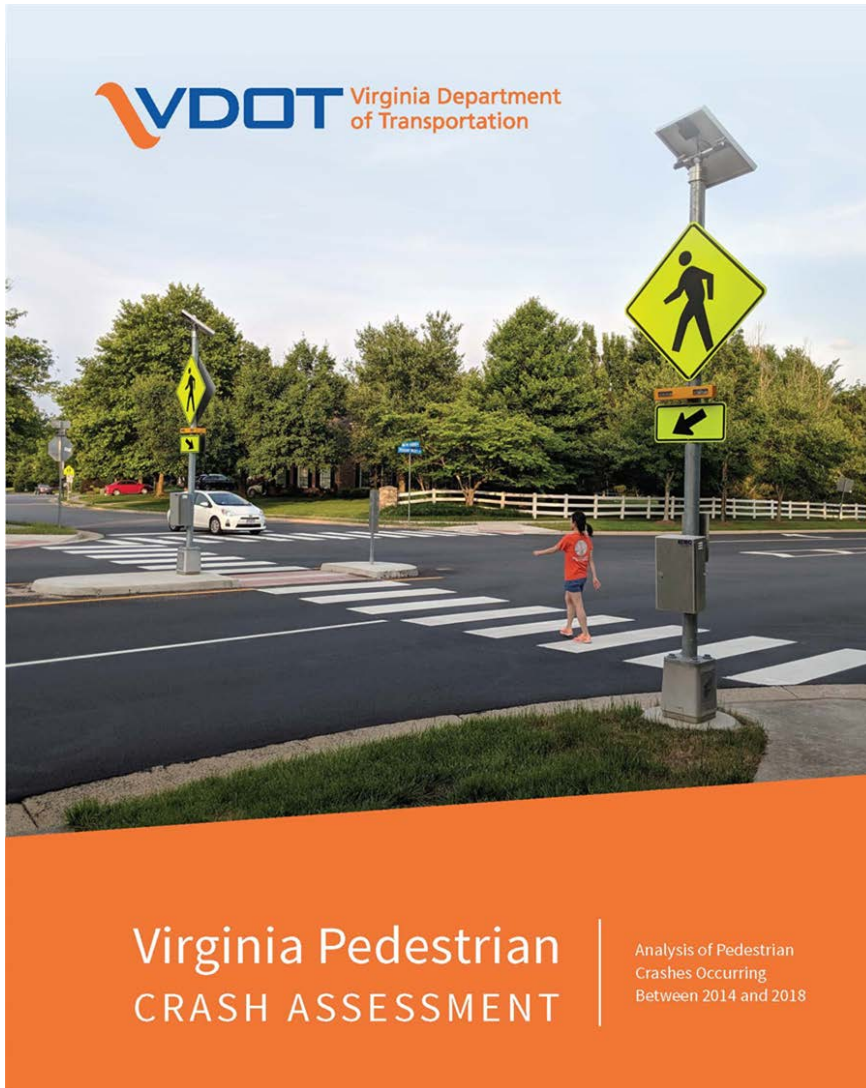
Treatment	HSIP Funding (\$M)	Complete By	Comments
High-Visibility Backplates	15.2	2021	
Flashing Yellow Arrows	17	2021	
Curve delineation	29	2024	To meet MUTCD
Pedestrian Crossings	22	2025	At select VDOT signals
Unsignalized Intersections	8.35	TBD	Partially funded through 2025
Shoulder Wedge	Maintenance	2035	
Centerline Rumble Stripes	3.1	2035	Funded through FY 2025
Edge line Rumble Strips	21.6	2035	Funded through FY 2025
<b>Total</b>	<b>\$116.7M</b>		



# Estimated Lives and Injuries Saved Per Year After Full Deployment

Systemic Safety Improvement	Benefit/Cost Ratio	Lives and Injuries Saved Per Year Once Fully Deployed		
		Deaths	Injuries	Total
High-Visibility Backplates (VDOT)	9.0	1	106	107
Flashing Yellow Arrows (VDOT)	12.6	1	90	91
Curve Delineation (VDOT)	1.7	6	104	110
Pedestrian Crossings (VDOT)	8.9	3	85	88
Unsignalized Intersection (VDOT)	1.3	2	62	64
Shoulder Wedge (VDOT)	17.0	13	281	294
CL Rumbles - Primaries (VDOT)	40.0	13	115	128
Edge Rumbles - Primaries (VDOT)	29.8	22	331	353
	<b>Total</b>	<b>61</b>	<b>1174</b>	<b>1235</b>

# Virginia Pedestrian Crash Assessment



- Analyzes pedestrian crashes
- First published in 2016
  - updated in 2017 and 2020
- Uses a variety of data sources to:
  - Understand common factors among crashes
  - Identify crash trends across time





# 5 Big Issues Relevant to Pedestrian Safety

## 1. Crossing the Street/Road

- Over 90% of Virginia's pedestrian deaths & injuries occur when crossing the street

## 2. Land Use and Transit

- If its urban or suburban, especially with transit service, pedestrians will almost always be present and need to cross

## 3. Speed

- Chance of death increases with speed, especially for peds and other vulnerable road users

## 4. Visibility

- $\frac{3}{4}$  or 77% of pedestrian deaths occur in limited light conditions.

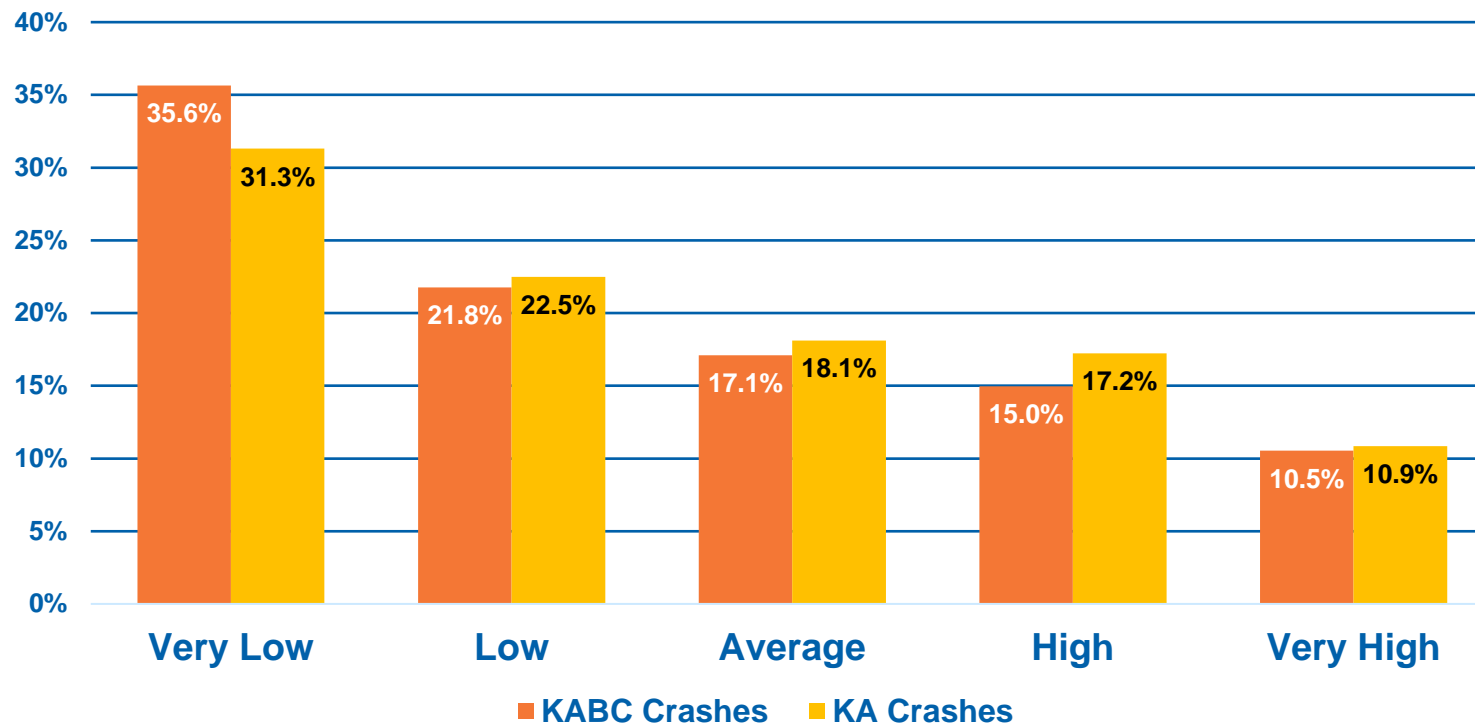
## 5. Size of Vehicle that strikes pedestrian

- Virginia has seen an increase in light truck/SUV Vs. pedestrian crashes, similar to national trend

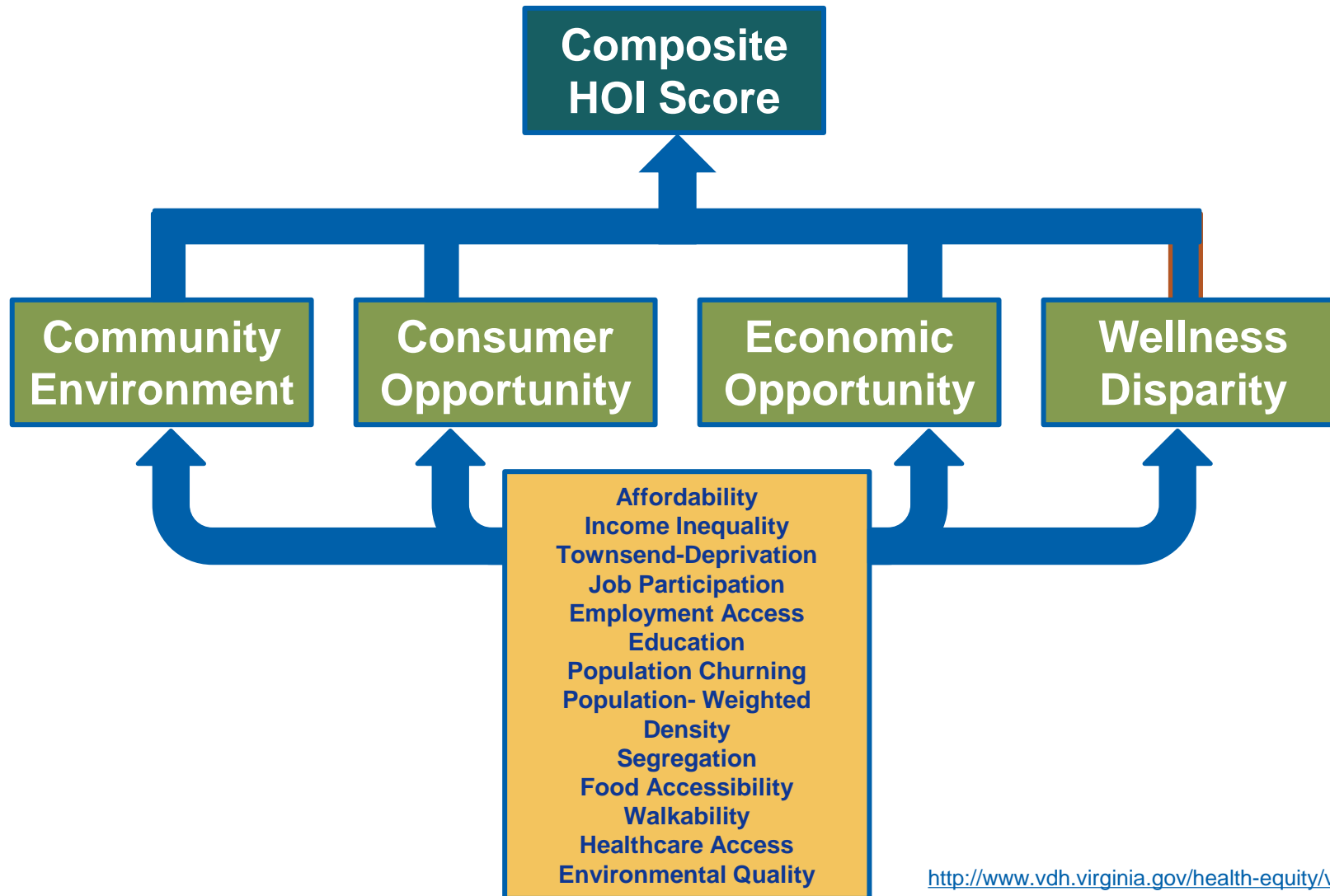
# Key Findings: Health Opportunity Index = Transportation and Equity Intersection

**Almost 60% of deaths and injuries occur in locations with VERY LOW or LOW Virginia Health Opportunity Index (HOI) Scores**

**Distribution of Pedestrian Crashes by HOI Category (2014-2018)**

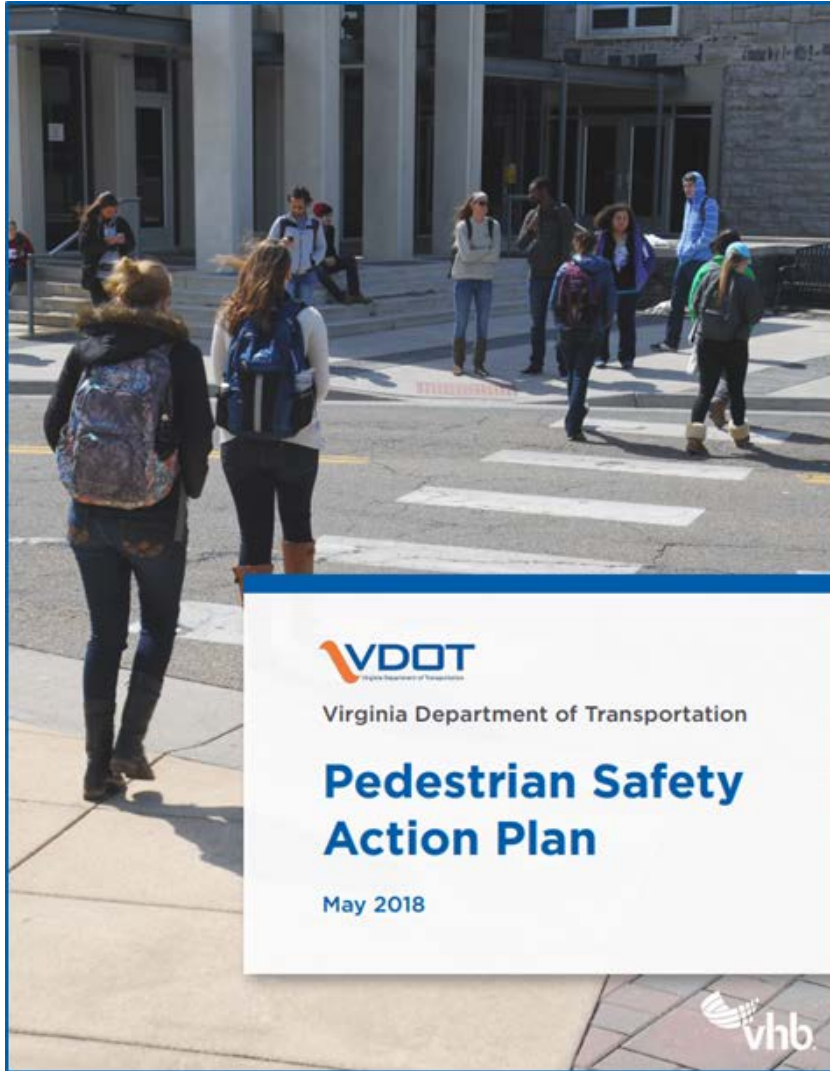


# What is the Virginia Health Opportunity Index?



<http://www.vdh.virginia.gov/health-equity/virginia-health-opportunity-index-hoi/>

# Virginia Pedestrian Safety Action Plan (PSAP) - 2018



## 3 Major Components:

- 1 – VDOT Policy Recommendations to ensure pedestrian safety
- 2 – Safety Analysis to determine which specific road locations pose the greatest risk for pedestrians
- 3 – Pedestrian safety countermeasure recommendations

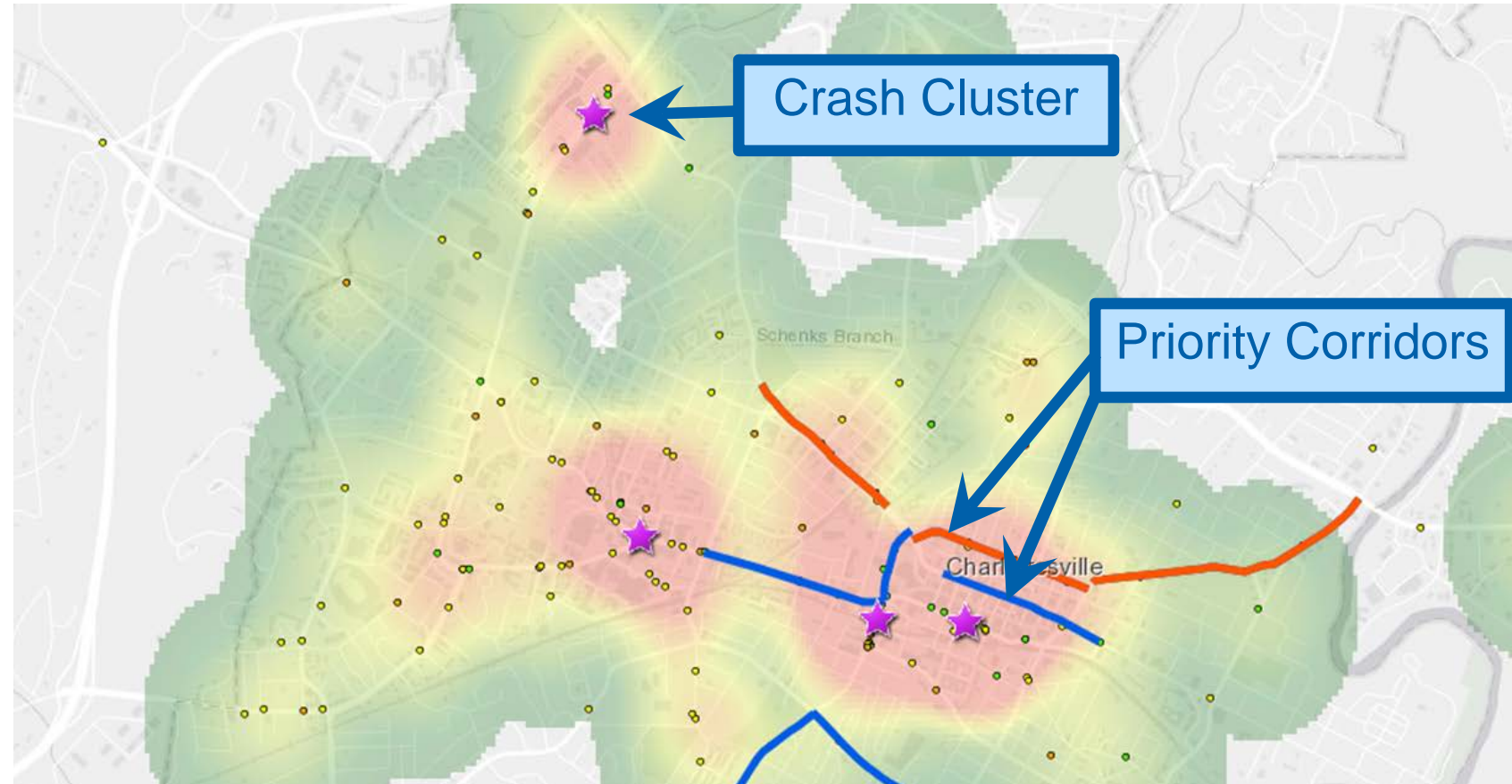
# Safety Analysis – Crash Clusters and Priority Corridors

## Crash clusters

- Density map of actual crash locations
- Look back

## Priority Corridors

- Top ranked corridors based on scoring criteria that used various data sources indicating pedestrian presence or risk
- Predictive





# Priority Corridor Criteria – 2020 Update

## 2020 PSAP Corridor Scoring Factors

High	Medium	Low
<ul style="list-style-type: none"><li>• Annual average daily traffic (AADT)</li><li>• Zero-vehicle households</li><li>• <b>Transit access</b></li><li>• <b>Health Opportunity Index (HOI)</b></li></ul>	<ul style="list-style-type: none"><li>• Roadway geometry</li><li>• Employment density</li><li>• Proximity to a school</li><li>• <b>Posted speed limit</b></li></ul>	<ul style="list-style-type: none"><li>• Pedestrian crash history</li><li>• Proximity to a park</li><li>• <b>Population density</b></li><li>• <b>Urban/rural context</b></li><li>• <del>Proportion of alcohol related crashes (by district)</del></li><li>• <del>Population living below the poverty line</del></li></ul>

# PSAP Online Mapping Tool - [https://bit.ly/VDOTPSAP\\_V2](https://bit.ly/VDOTPSAP_V2)

**Welcome to VDOT's Ped Safety Action Plan (PSAP) Map Viewer!**

This map works in conjunction with Virginia's award-winning PSAP report, which can be read and downloaded by clicking [HERE](#)

You can also read and download the supporting Virginia Pedestrian Crash Assessment report by clicking [HERE](#)

The map defaults to show Version 2 (the latest version) by default, that includes pedestrian priority corridors and crash clusters that have been identified as a result of the latest PSAP analysis methods. Version 2 is based on pedestrian crashes that occurred between 2014 and 2018 and the priority pedestrian corridors are organized into three tiers as follows:

- Priority 1 (P1), shown in red, which represent the corridors that score in the top 0.1% of scored corridors in the state
- Priority 2 (P2), shown in blue, which represent the corridors that score in the top 1% of scored corridors, and
- Priority 3 (P3), shown in green, which represent corridors that fall in the top 5% of scored corridors

Version 2 pedestrian crash clusters can be shown by turning the heat map layer on. The top crash clusters in each VDOT District are noted by yellow stars.

The original PSAP (Version 1) can still be viewed using this map viewer. For a brief video tutorial on how to toggle between Version 1 and Version 2, please click [HERE](#). Finally, to download the underlying GIS data for Version 2, please click [HERE](#)

For more information, please contact:

Map Administrator  
Engineering Division  
804.4196 (office) 804.819.9370 (cell)  
[Mark.Cole@VDOT.Virginia.gov](mailto:Mark.Cole@VDOT.Virginia.gov)

**Download PSAP**

**View YouTube Tutorial**

OK

# Pedestrian Crashes - Proven Countermeasures

In Virginia, over 90% of serious pedestrian crashes occur while crossing the road and most also occur during limited light conditions

High-visibility Crosswalk



Up to 40% crash reduction

Ped Countdown Signal



Up to 40% crash reduction

Ped Refuge Island



Up to 46% crash reduction

Rectangular Rapid Flashing Beacon



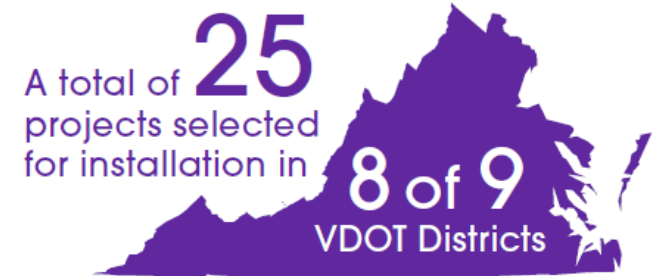
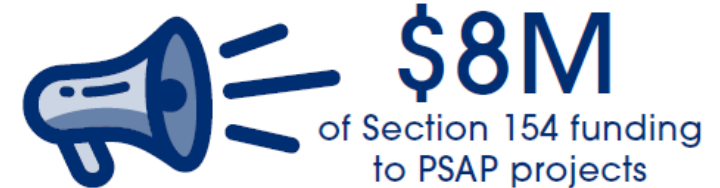
Up to 47% crash reduction

# PSAP Infrastructure Projects

- Summer 2018 - Identified \$8 Million HSIP funding for initial PSAP projects
- **Criteria:**
  - Low-cost/high-benefit countermeasures
  - Address pedestrian crossings only
  - Shovel Ready or quick delivery
- **Overwhelming Interest**
  - 59 project requests (\$43M total)
  - Funded 25 projects
  - Projects are being completed now



VDOT staff evaluated the candidate projects and, in November 2018, announced the award of



Funding  
requested  
ranged  
between:





# PSAP Pedestrian Safety Infrastructure Projects

- Fall 2019 – Additional \$25 Million approved for PSAP improvements
- All VDOT signals on PSAP priority corridors will receive crosswalks and ped countdowns over a five –year period



*Jefferson Park Avenue & Brandon Avenue, Charlottesville, VA*



# VDOT District Quarterly Dashboard

Power BI District Performance Report | Traffic Safety Initiatives | Data updated 1/27/21

We updated the look of reports. Take a tour, and we'll show you how to get around. [Start tour](#)

**Non Paving-related Safety Initiatives:** **High Visibility Backplates**

Curve Delineation | Flashing Yellow Arrow | **High Visibility Backplates** | Pedestrian Crossing | Unsignalized Intersection

Data as of 1/20/2021

**Development CY 2020**      **Delivery CY 2020**      **Due by: 7/1/2021**

[Systemic Safety Criteria](#)

District	Development YTD			Delivery YTD				Life To Date			
	# Q1-Q4 Comp	Q1-Q4 Plan	% Comp	CY 20 Plan	# Q1-Q4 Comp	Q1-Q4 Plan	% Comp	CY 20 Plan	# Comp	Total #	% Comp
Bristol		1	0%	1			0%		96	98	98%
Culpeper		45	0%	45	66		0%		132	134	99%
Fredericksburg		67	0%	67	199	68	293%	68	267	267	100%
Hampton Roads			0%		113	114	99%	114	189	190	99%
Lynchburg			0%				0%		88	88	100%
Northern Virginia	1055	1104	96%	1104	539	540	100%	540	871	1421	61%
Richmond	238	148	161%	148	146	144	101%	144	319	463	69%
Salem			0%		25	6	417%	6	179	179	100%
Staunton	106	80	133%	80	18	40	45%	40	129	218	59%
<b>Total</b>	<b>1399</b>	<b>1445</b>	<b>97%</b>	<b>1445</b>	<b>1106</b>	<b>912</b>	<b>121%</b>	<b>912</b>	<b>2270</b>	<b>3058</b>	<b>74%</b>

# Signalized Intersection Ped Crossings

## Non Paving-related Safety Initiatives:

## Pedestrian Crossing

Curve Delineation	Flashing Yellow Arrow	High Visibility Backplates	<b>Pedestrian Crossing</b>	Unsignalized Intersection
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Data as of 1/20/2021

[Systemic Safety Criteria](#)

### Development CY 2020

### Delivery CY 2020

Due by: 6/30/2025

District	YTD				YTD				Life To Date		
	# Q1-Q4 Comp	Q1-Q4 Plan	% Comp	CY 20 Plan	# Q1-Q4 Comp	Q1-Q4 Plan	% Comp	CY 20 Plan	# Comp	Total #	% Comp
Bristol			0%				0%				
Culpeper		5	0%	5			0%		0	11	0%
Fredericksburg	1		0%		10		0%		26	65	40%
Hampton Roads		3	0%	3			0%		0	3	0%
Lynchburg			0%				0%				
Northern Virginia	35	35	100%	35	2		0%		2	376	1%
Richmond	2	3	67%	3	2	4	50%	4	17	129	13%
Salem			0%				0%		0	8	0%
Staunton			0%				0%				
<b>Total</b>	<b>38</b>	<b>46</b>	<b>83%</b>	<b>46</b>	<b>14</b>	<b>4</b>	<b>350%</b>	<b>4</b>	<b>45</b>	<b>592</b>	<b>8%</b>

# Next Steps

- **Continue HSIP funding policy development in early 2021**
- **CTB approval of FY26 Six-Year plan with additional state funding for systemic treatments**
  - **Determine appropriate amount for local maintained networks**
- **VDOT move forward with systemic projects per plan**
  - **Coordination between Central Office, Districts, and Localities**

# Questions?