

ARRIVE ALIVE VIRGINIA

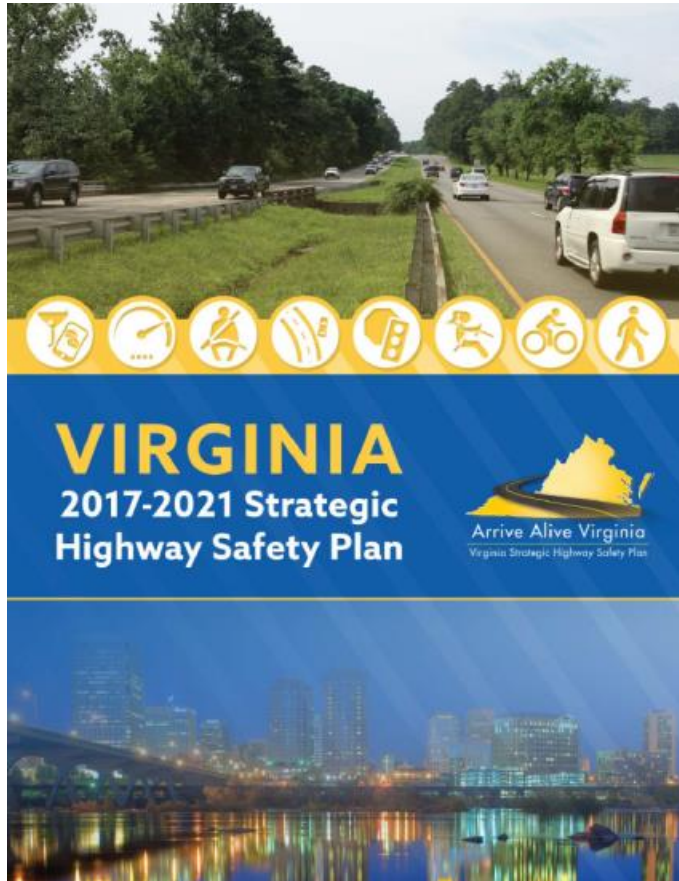
Virginia Strategic Highway Safety Plan (SHSP) 2017-2021

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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

2017-2021 SHSP Emphasis Areas

Emphasis Areas

Roadway Departure

Intersections

Impaired Driving

Occupant Protection

Speed

Young Drivers

Pedestrians

Bicyclists

Special Safety Areas

EMS

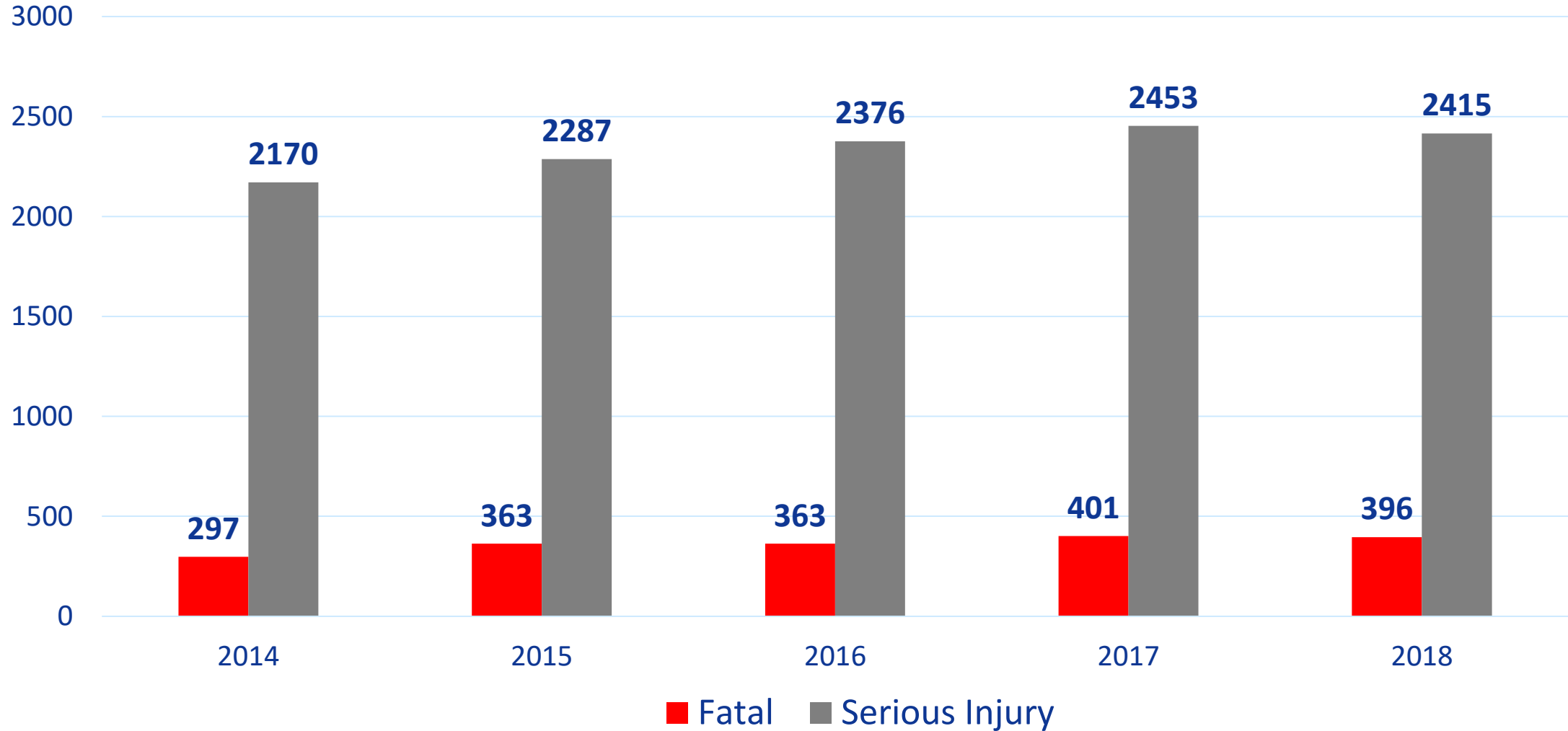
Connected / Autonomous
Vehicles

Data



Road Departure Crashes

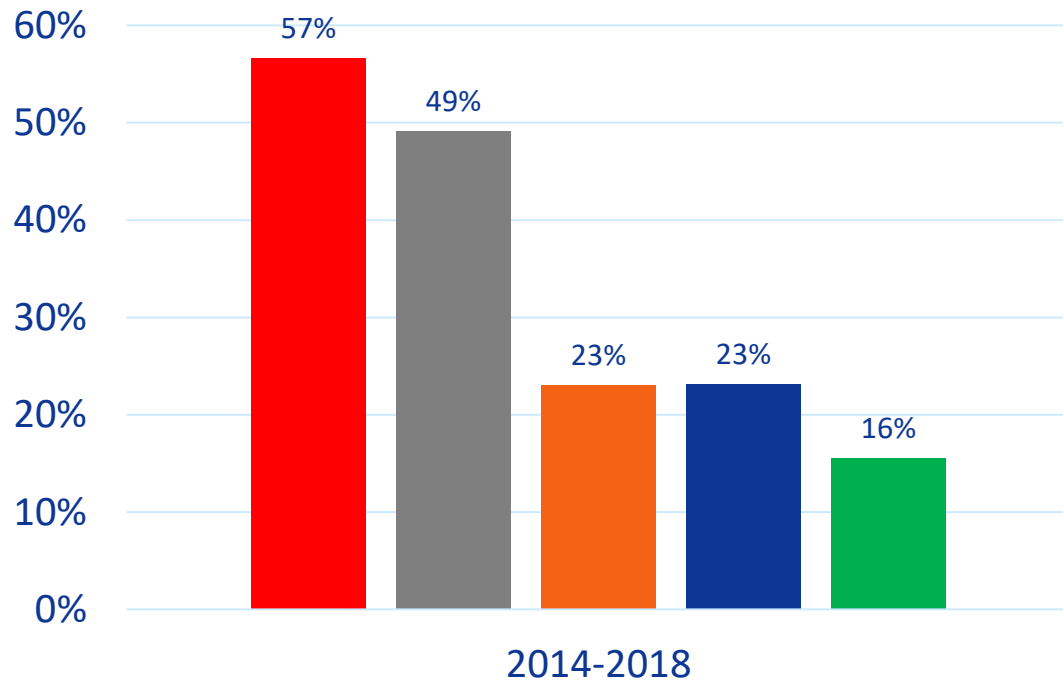
Virginia Fatal & Serious Injury Roadway Departure Crashes



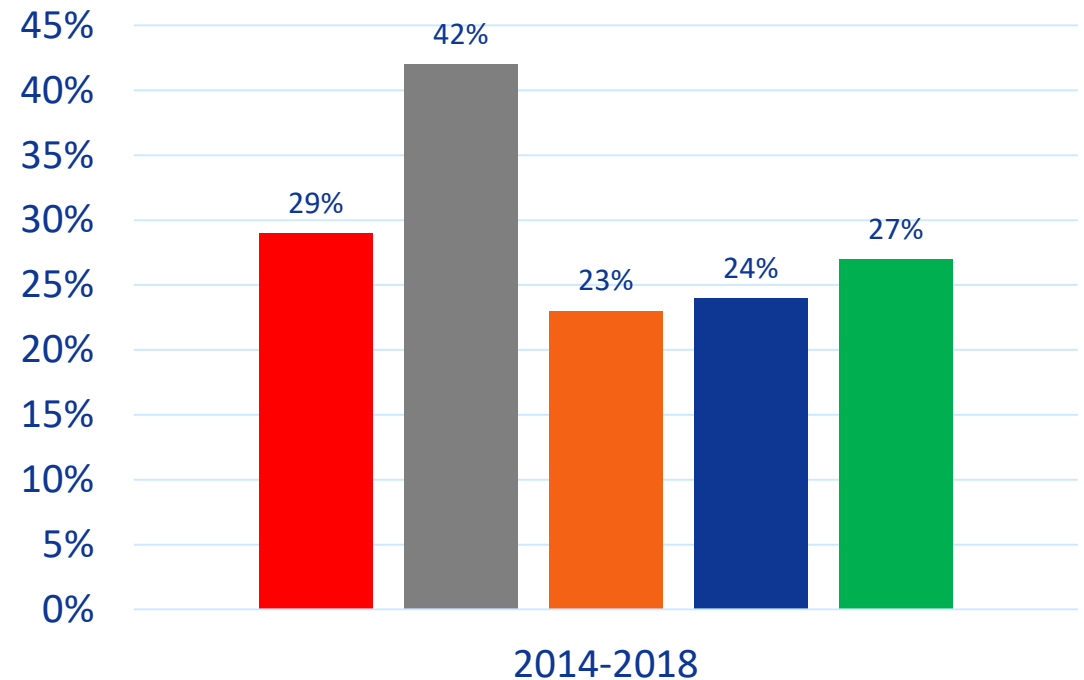
Virginia Roadway Departure Crashes

% Crashes Involving Big 4 Behaviors

Fatal



Serious Injury



■ Unbelted ■ Speeding ■ Drinking ■ Distracted ■ None

Annual Road Departure Crashes By District

2016 - 2018 Average

District	People			Fatality and Injury Rate*		
	Death	Ser. Inj.	All Injuries	Death	Ser. Inj.	All Injuries
Bristol	33	248	1,103	0.74	5.59	24.81
Salem	51	358	1,455	0.69	4.87	19.80
Lynchburg	48	270	1,020	1.16	6.57	24.83
Richmond	75	570	2,371	0.49	3.73	15.52
Hampton Roads	69	521	2,359	0.43	3.24	14.68
Fredericksburg	33	229	844	0.53	3.69	13.62
Culpeper	31	245	1,005	0.61	4.84	19.84
Staunton	44	285	1,240	0.60	3.92	17.06
Northern Virginia	33	231	1,336	0.17	1.20	6.97
Statewide	415	2,956	12,733	0.49	3.48	14.99

* Rate as per 100M DVMT

Virginia Road Departure Crashes By Rural/Urban

63% of Fatal and 55% of Serious Injury RD Crashes → Rural roads

Functional Class	2018 Death Rate*	2018 Serious Injury Rate*
Rural Interstate	0.21	2.42
Rural Arterial	0.96	4.68
Rural Collector/Local	1.58	11.23
Urban Interstate/Freeways	0.20	1.93
Urban Arterial	0.28	1.66
Urban Collector/Local	0.29	2.11
Statewide Average	0.49	3.46

* Rate per 100M VMT

SHSP Roadway Departure Strategies and Actions

Strategy 1. Reduce the likelihood that a vehicle will leave the roadway

Strategy 2. Minimize the consequences of leaving the roadway

Example Actions:

- 1.1,1.2 - Install roadway departure countermeasures where appropriate
- 1.3 - Post appropriate speed limits
- 1.6 - Improve/widen road shoulders and install safety edge
- 2.1 - Install roadside safety devices (e.g., guardrail)
- 2.3 - Remove/shield trees and other fixed objects in the clear zone

Roadway Departure Crashes - Proven Countermeasures

In Virginia, 87% of serious RD outcomes are from - fixed object, head on, and rollover crashes

Edge line Rumble Strips



Up to 50% crash reduction

Curve Signs



Up to 16% crash reduction

Centerline Rumble Stripe



Up to 60% crash reduction

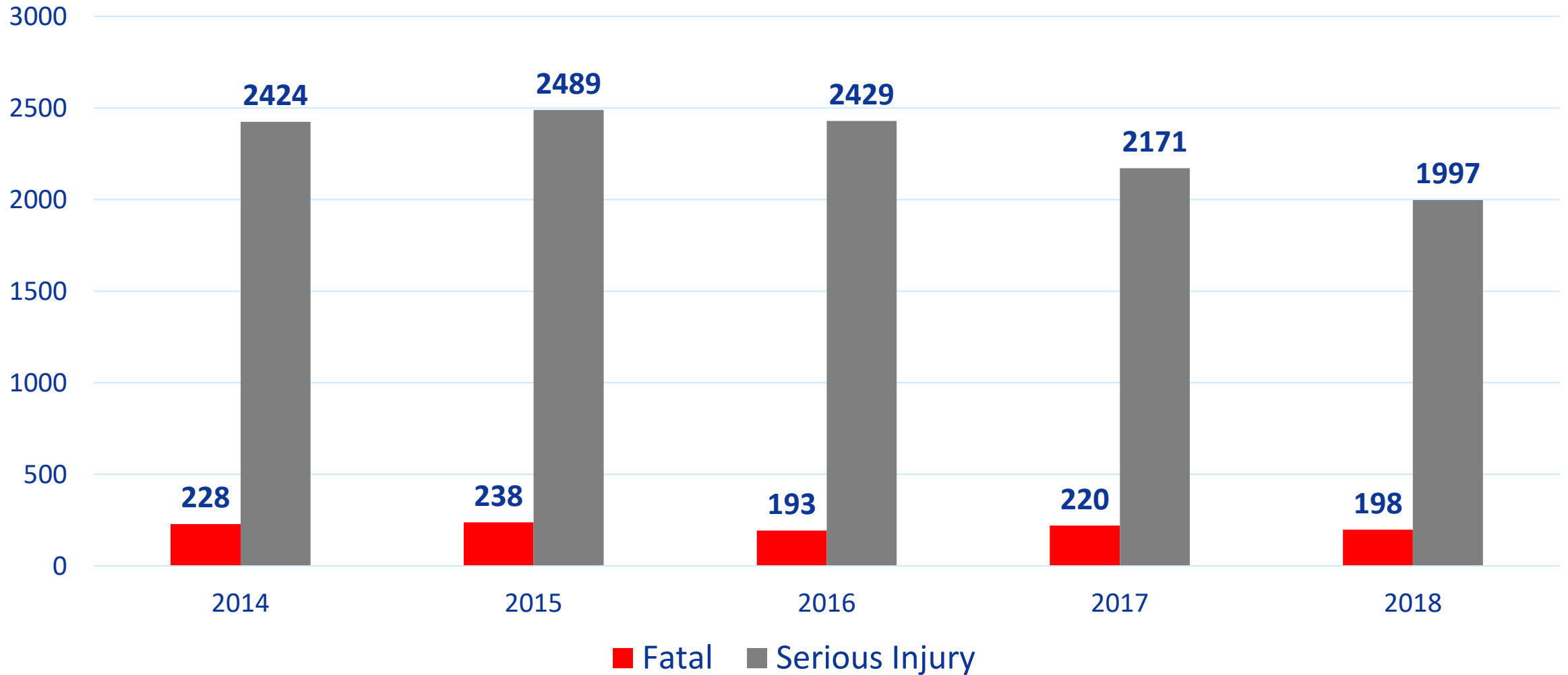
Pavement Wedge



Up to 20% crash reduction

Intersection Crashes

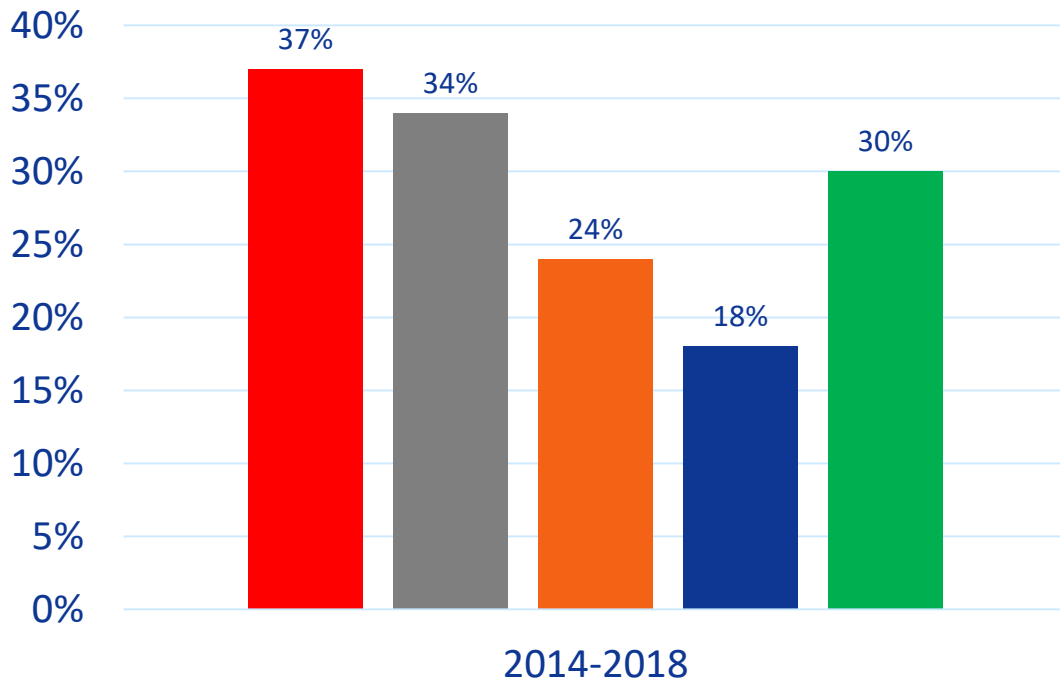
Virginia Fatal & Serious Injury Intersection Crashes



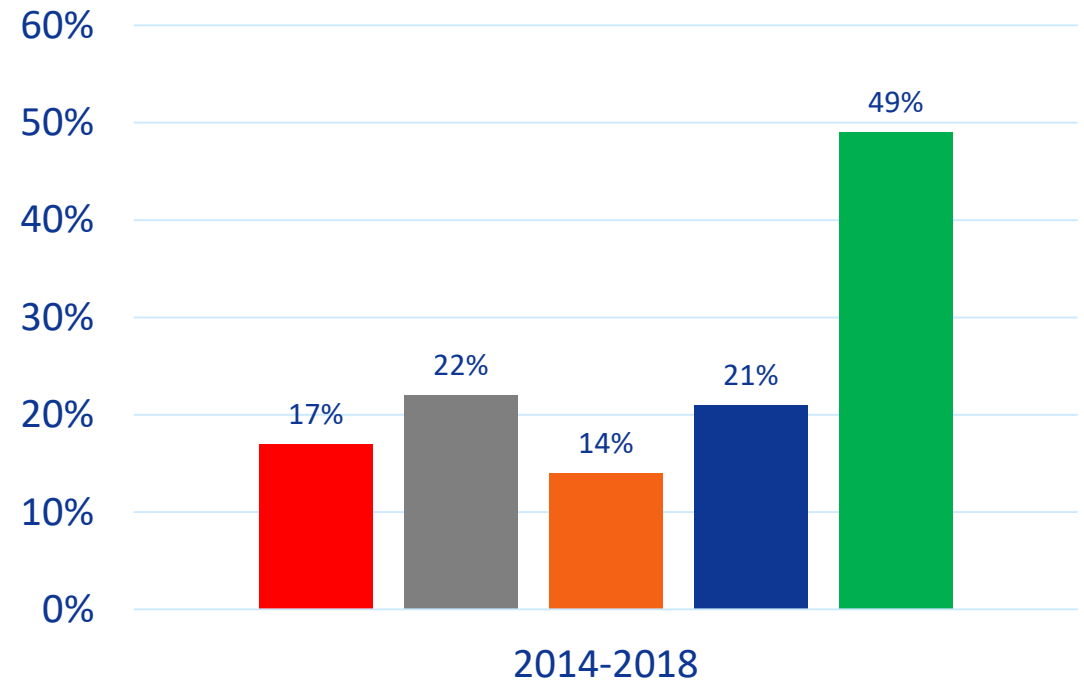
Virginia Intersection Crashes

% Crashes Involving Big 4 Behaviors

Fatal



Serious Injury



■ Unbelted ■ Speeding ■ Drinking ■ Distracted ■ None

Annual Intersection Crashes By District 2016 – 2018 Average

District	People			Fatality and Injury Rate*		
	Death	Ser. Inj.	All Injuries	Death	Ser. Inj.	All Injuries
Bristol	11	121	766	0.26	2.73	17.50
Salem	25	249	2,043	0.34	3.39	27.79
Lynchburg	14	165	1,358	0.35	4.02	32.89
Richmond	32	437	5,729	0.21	2.86	36.93
Hampton Roads	47	679	7,835	0.29	4.22	48.87
Fredericksburg	21	204	1,745	0.33	3.28	27.80
Culpeper	12	160	1,359	0.24	3.17	26.77
Staunton	20	183	1,559	0.28	2.51	21.51
Northern Virginia	29	480	6,751	0.15	2.51	34.93
Statewide	211	2,678	29,145	0.25	3.15	34.31

* Rate as per 100M DVMT

SHSP Intersection Strategies and Actions

Strategy 1. Reduce crashes and injuries through design changes

Strategy 2. Improve public comprehension and compliance with intersection traffic control devices

Example Actions:

- 1.1 - Deploy technology to allow real-time signal monitoring
- 1.3 - Deploy access management strategies to reduce conflict points
- 1.7 - Design and construct intersections for all road users
- 2.1 - Produce websites, brochures, and updates to driver's manual
- 2.4 - Update traffic signal timing

Intersection Crashes - Proven Countermeasures

In Virginia, 82% of serious intersection crashes are angle, fixed object, rear end, and pedestrian crashes

High-visibility Backplates



Up to 15% crash reduction

Unsignalized Intersection Sign and Marking Enhancements



Up to 10% crash reduction

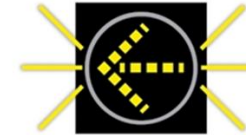
Flashing Yellow Arrow



Steady Red Arrow
Drivers turning left must stop and wait (except where permitted by law).



Steady Yellow Arrow
Stop, if you can do so safely.



Flashing Yellow Arrow
Proceed with left turn after yielding to oncoming traffic and pedestrians.



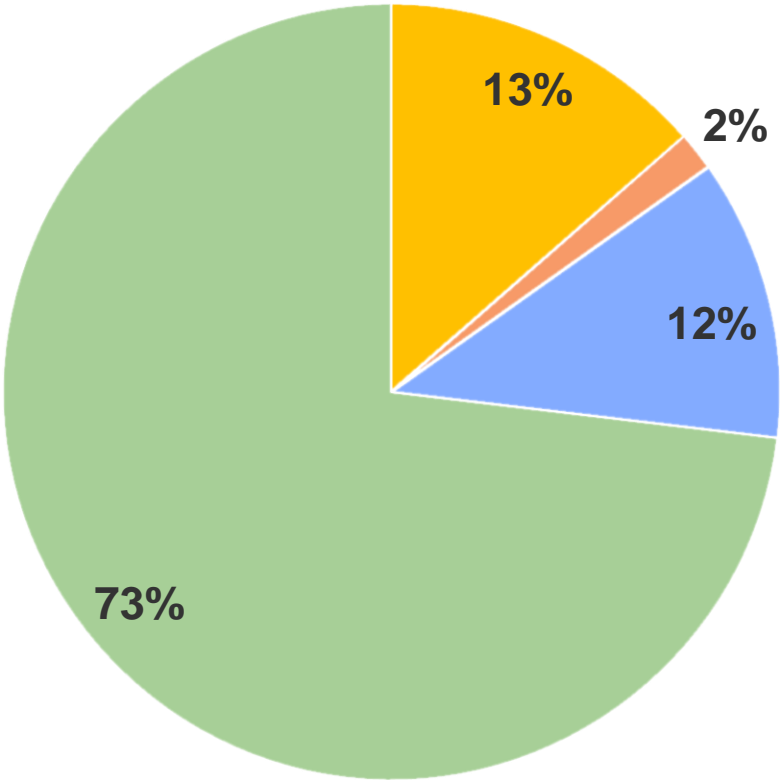
Steady Green Arrow
Proceed with left turn.

Up to 20% crash reduction

Pedestrian Crashes

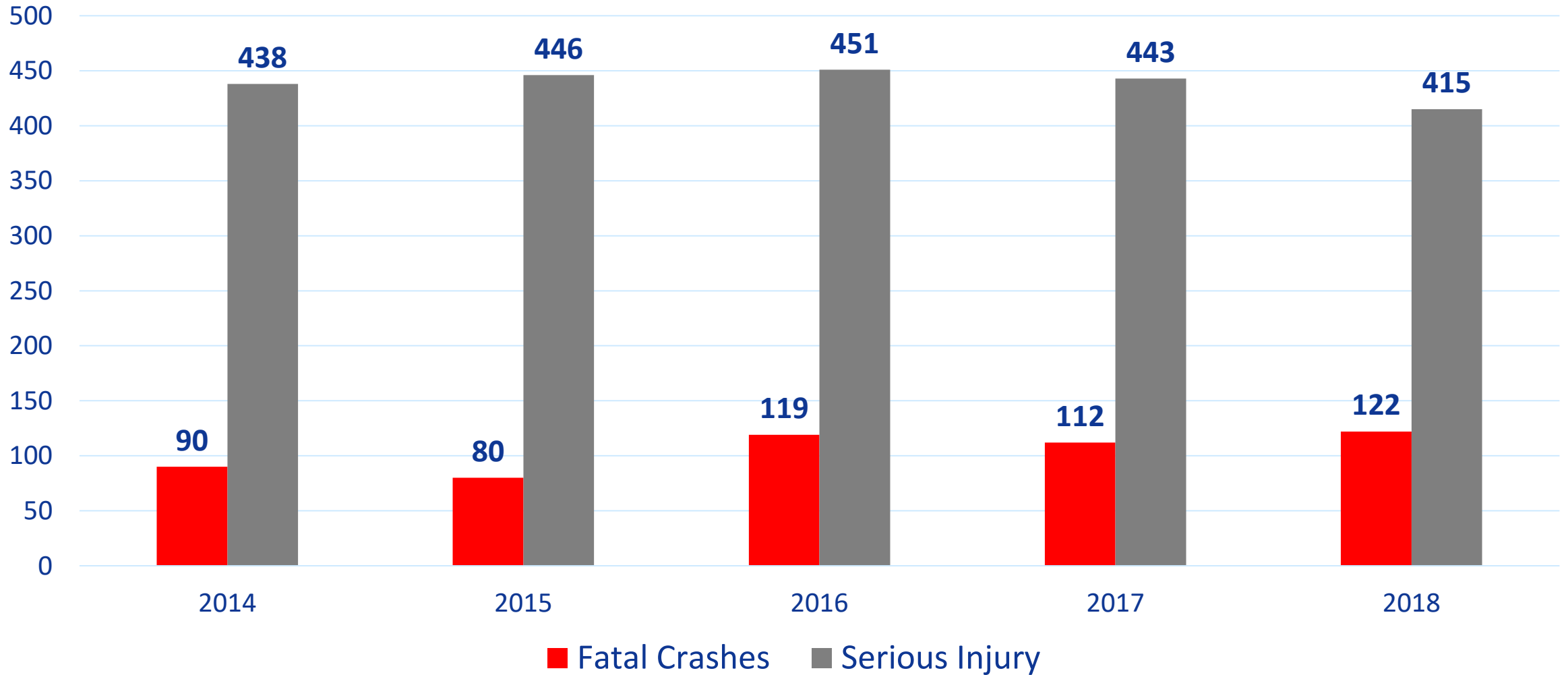
Virginia Traffic Deaths by Roadway User Type (2014-2018)

In 2018,
231 vulnerable
road users died,
28% of
all traffic
deaths



■ Pedestrians ■ Bicyclists ■ Motorcyclists ■ Other Motorists

Virginia Fatal & Serious Injury Pedestrian Crashes



Annual Pedestrian Crashes By District

2016 – 2018 Average

District	People			Fatality and Injury Rate*		
	Death	Ser. Inj.	All Injuries	Death	Ser. Inj.	All Injuries
Bristol	4	11	30	1.20	2.95	8.19
Salem	8	31	87	2.03	7.48	21.14
Lynchburg	6	16	45	1.13	3.18	8.95
Richmond	29	95	321	1.62	5.36	18.12
Hampton Roads	26	122	402	6.41	30.01	99.23
Fredericksburg	9	15	55	0.35	0.60	2.22
Culpeper	4	15	69	0.33	1.18	5.30
Staunton	8	25	75	1.13	3.50	10.64
Northern Virginia	25	124	539	4.56	22.27	97.13
Statewide	119	452	1,623	1.41	5.33	19.14

* Rate as per 100,000 population

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

- If its urban or suburban, 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

SHSP Pedestrian Strategies and Actions

Strategy 1. Identify corridors with potential for pedestrian crashes and apply countermeasures

Strategy 2. Educate roadway user on appropriate behavior

Example Actions:

- 1.1 - Identify pedestrian corridors and crash hot spots
- 1.5 - Enhance pedestrian accommodations at signalized intersections
- 2.1 - Enhance outreach materials to remind roadway users of pedestrian safety
- 2.2 - Conduct pedestrian safety outreach and education to targeted populations

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

Concluding Thoughts

- **Roadway Departure, Intersection and Pedestrian crashes drive death and serious injury numbers in Virginia**
- **Urban areas tend to have more crashes but lower crash rates**
- **Rural areas tend to have fewer (but more severe) crashes**
- **Pedestrian crash outcomes greatly influenced by speed and presence of pedestrian road crossing infrastructure**
- **Low-cost/high-benefit, systemic safety countermeasures exist to help address predominate crash issues**

Questions?

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