ZERO IS OUR GOAL

A SAFE SYSTEM IS HOW WE GET THERE

U.S. Department of Transportation

Federal Highway Administration

Upper Savannah Council of Governments (USCOG) Roadway Departure Safety Implementation Plan (RwDSIP)

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Disclaimer

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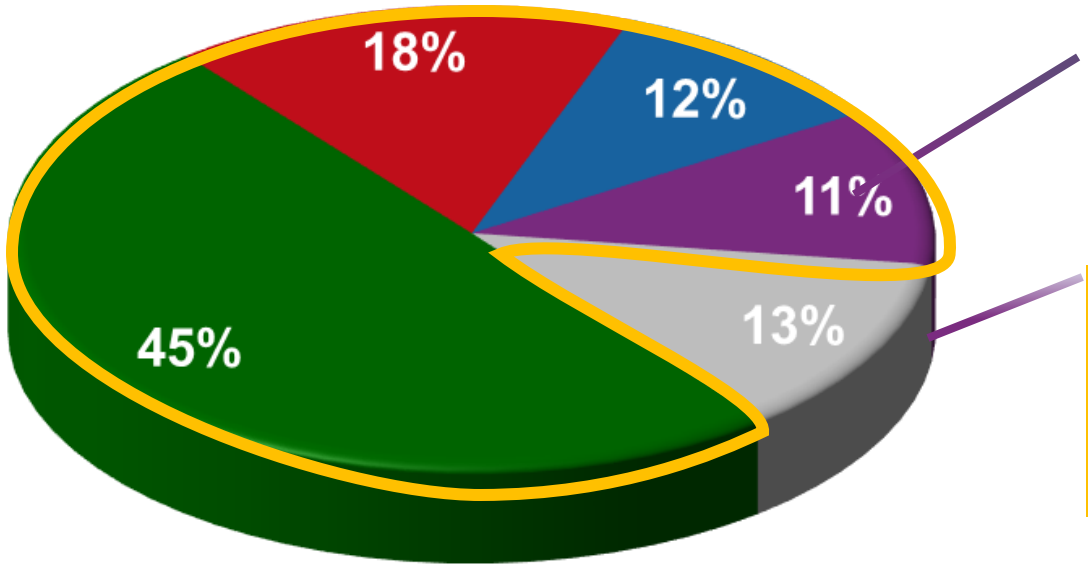
Agenda

- Introductions
- Background and Purpose
- Safety Management and RwDSIP Process
- Risk Analysis
- Roadway Departure Countermeasures

Background and Purpose

US Fatalities by FHWA Focus Area

Average National Traffic Fatalities: 37,338/Year



5.7%	Intersection and Pedestrian/Bicycle
4.0%	Intersection and Roadway Departure
1.4%	Roadway Departure and Pedestrian/Bicycle
0.2%	All Focus Areas

45%	Roadway Departure Only
18%	Intersection Only
12%	Pedestrian/Bicycle Only
11%	Multiple Focus Areas
13%	Crashes not involving a Focus Area

FHWA defines a roadway departure (RwD) crash as a crash which occurs after a vehicle crosses an edge line or a center line, or otherwise leaves the traveled way.

Source: NHTSA FARS 2018-2020

RwD Focused Approach to Safety (FAS) 2021

FAS background

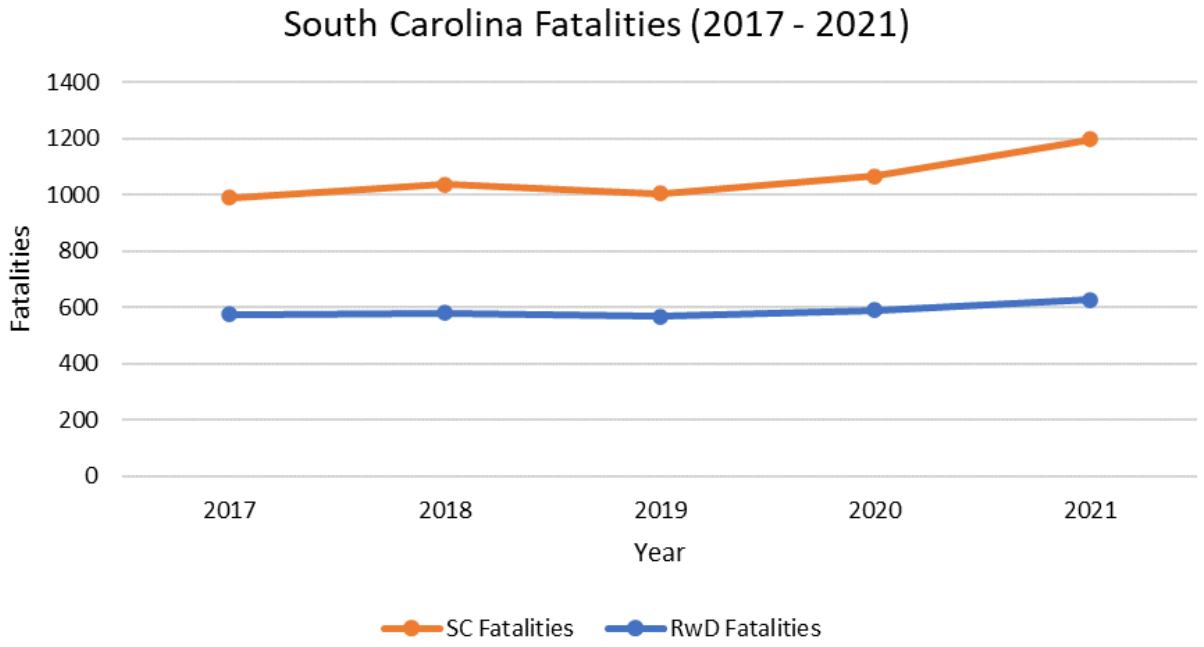
- Started in 2004 and updated every few years (last in 2021)
- Data-driven approach to strategic planning
- Basis for focusing and prioritizing FHWA Safety Program resources
- https://safety.fhwa.dot.gov/fas/

Benefits

- Increases awareness
- Provides data analysis and action plan development
- Leads to critical safety infrastructure improvements
- Assists FHWA, State DOTs, and localities when prioritizing resources.
- Creates positive organizational changes in safety culture, policies, and procedures.

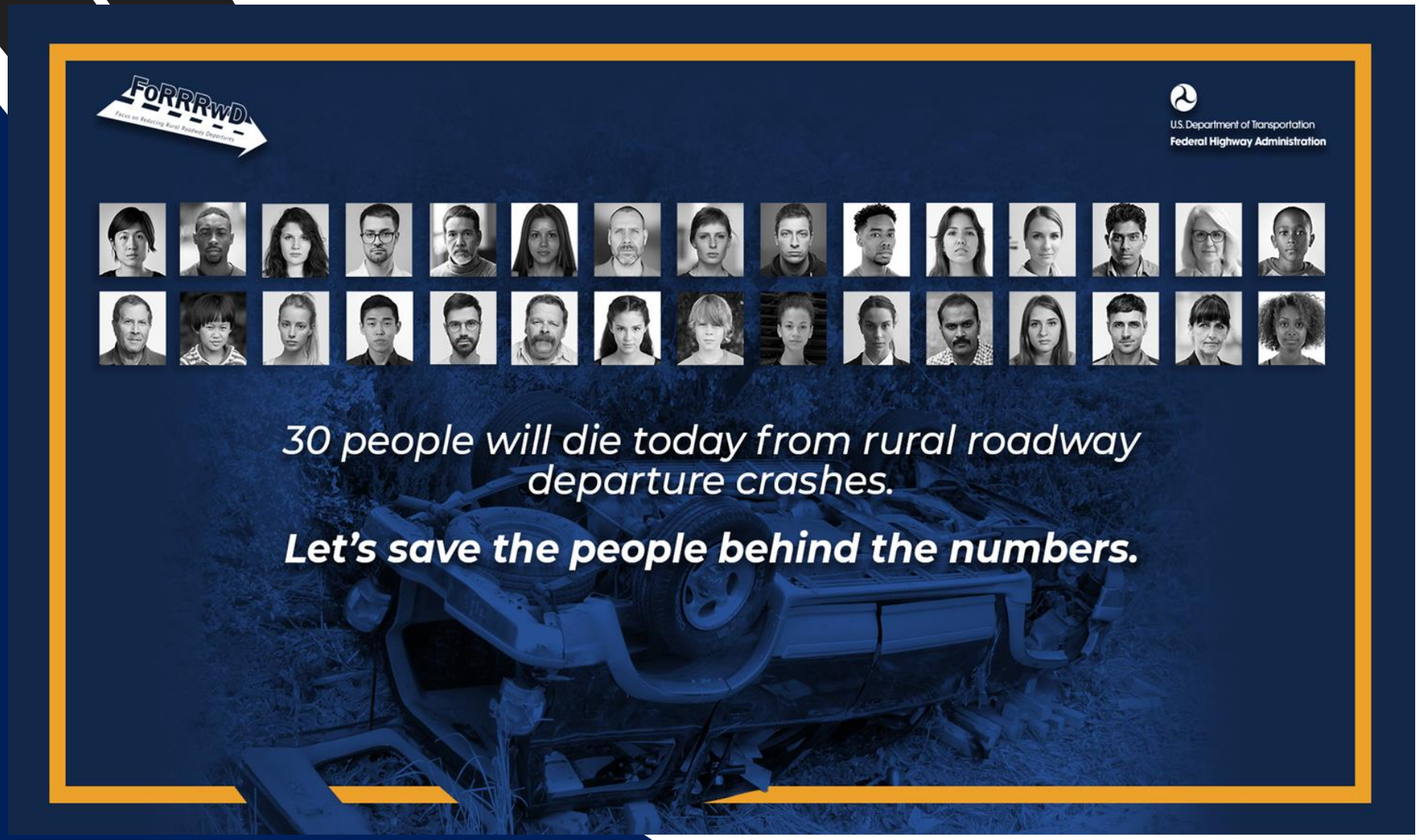
Safety Management and RwDSIP Process

Roadway Departure Safety in South Carolina

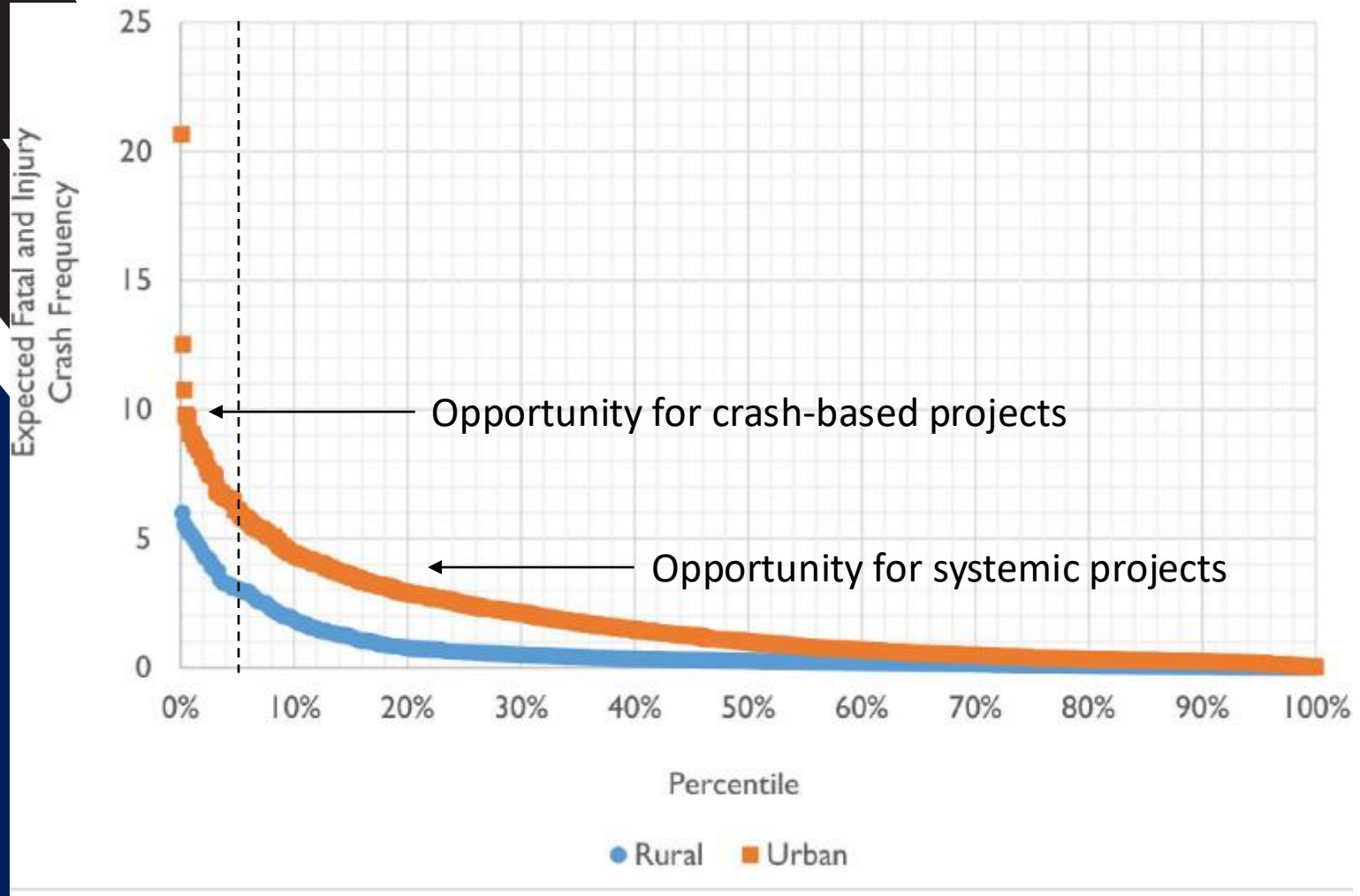


- South Carolina
  - Approximately 1,050 annual fatalities
  - RwDs are 55 percent
- Upper Savannah
  - Approximately 57 annual fatalities
  - RwDs are 70 percent

One person dies each week in the USCOG in a crash



Reasons for Systemic Approach



Systematic vs Systemic Approach

Systematic

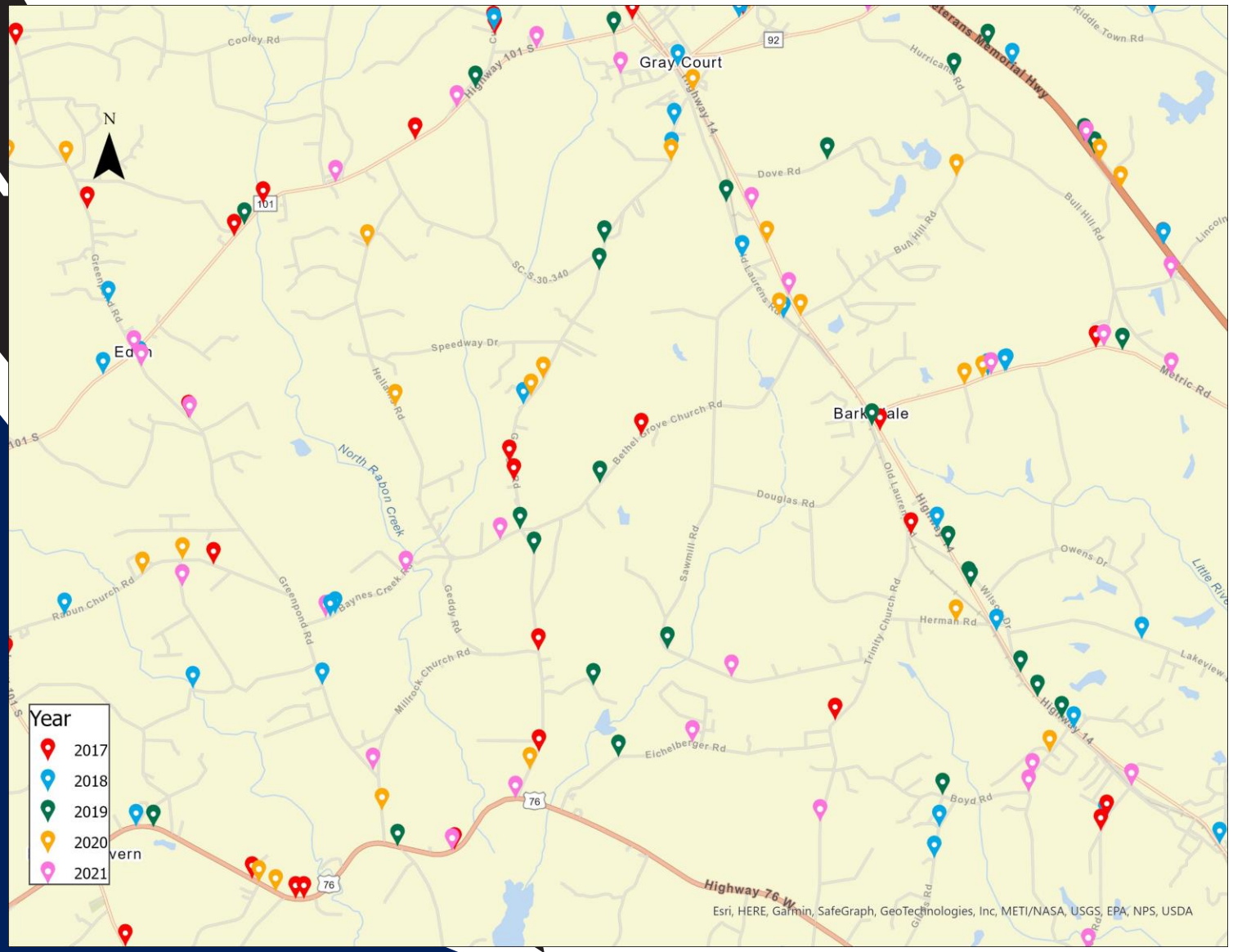
- ✓ Addresses many locations
- $ Requires more funding
- ✗ Prioritize Risks

Systemic

- ✓ Proactive
- ✓ Prioritize High Risk Locations
- ✓ Proven Countermeasures

Source: FHWA

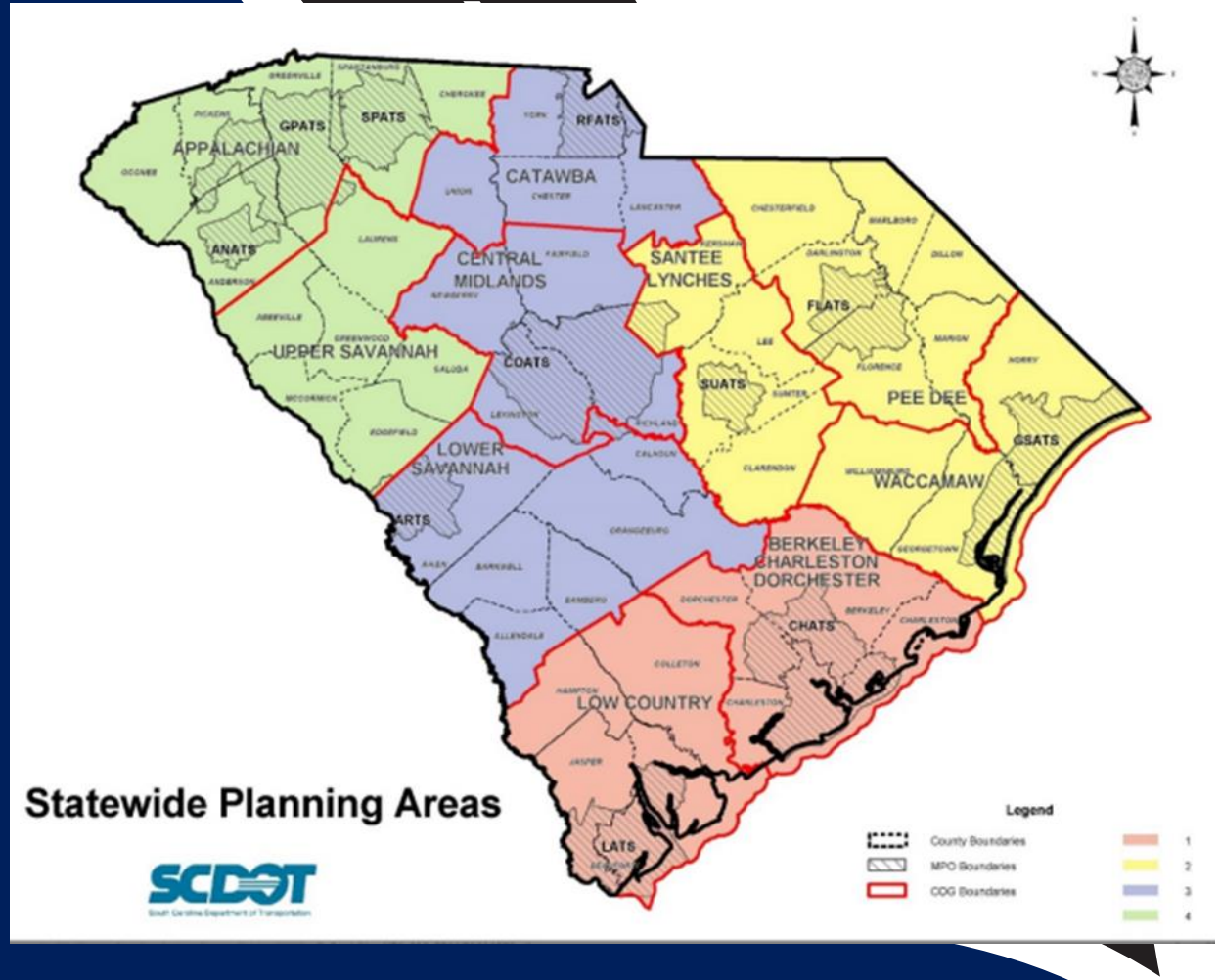
Where Do RwDs Occur in USCOG?



USCOG Most Harmful Event – KABC RwDs

Collision Type	2017
Trees	195
Curb, Ditch, Embankment	178
Head-on	93
Post and Poles	63
Other	55
Rollover	54
Barrier	31
Other Fixed Object	24

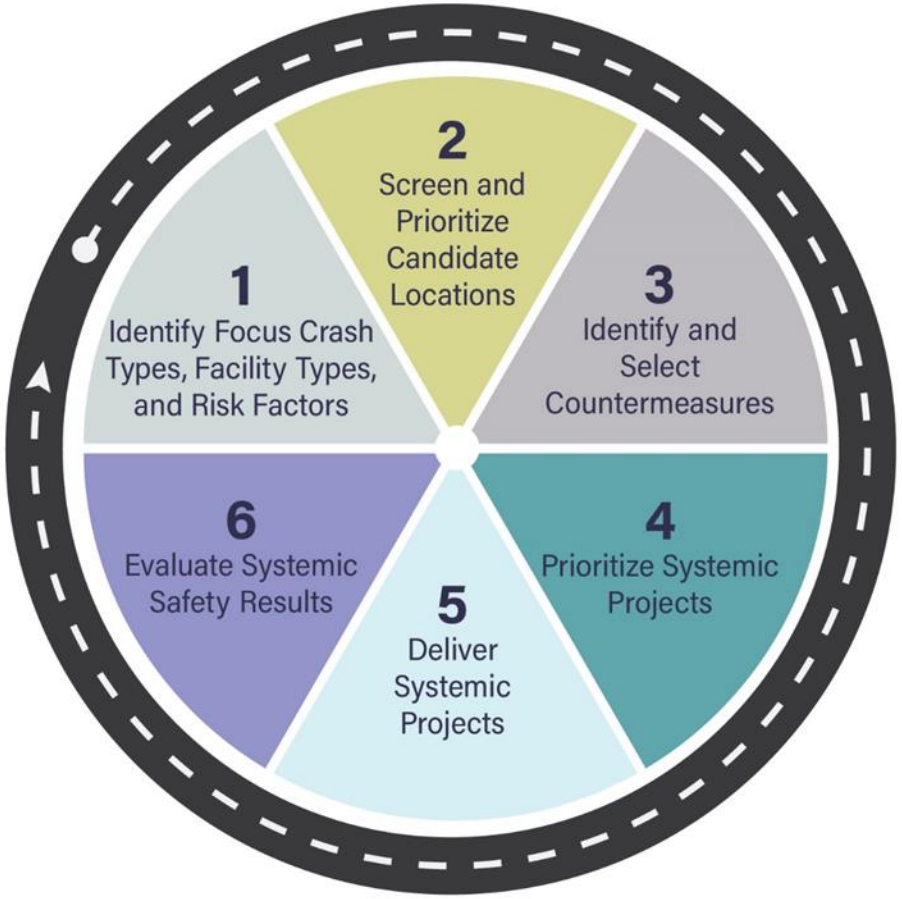
USCOG RwDSIP



To combat RwD fatalities and serious injuries on all roads

- **Engage** USCOG to develop RwDSIP
- **Identify** prioritized locations based on risk
- **Prioritize** countermeasures for implementation
- **Develop** implementation framework
- **Assess** potential costs and benefits
- **Serve** as a model for other regional planning organizations

USCOG RwDSIP

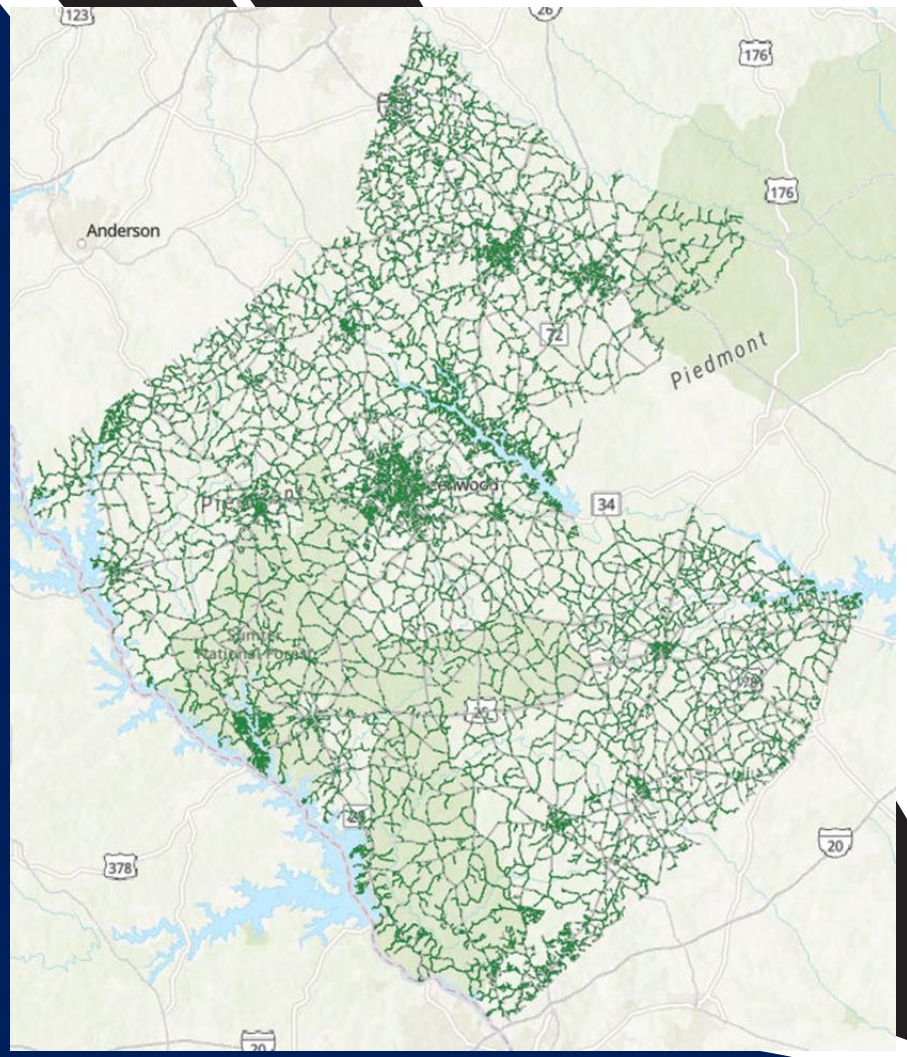


Uses systemic safety approach

- Identifies most common crash types
- Evaluates focus facility types
- Assesses risk factors for severe outcomes
- Recommends low-cost countermeasures for prioritized deployment

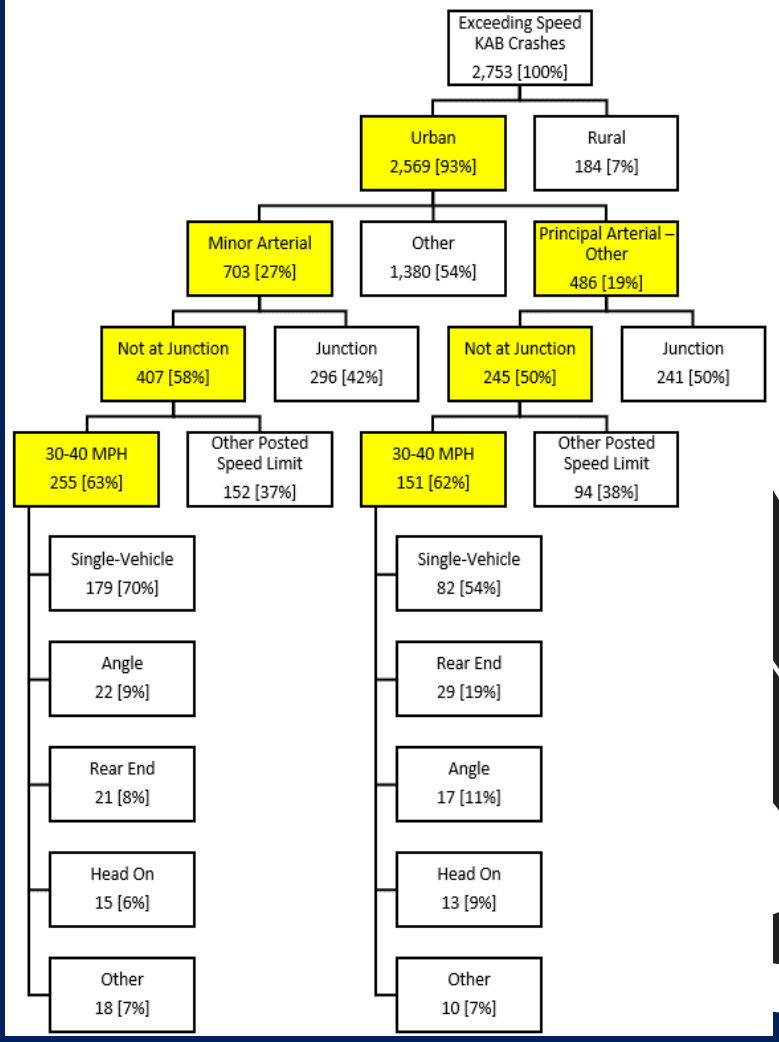
Risk Analysis

Data



- **Crash Data**
- **Traffic Volume Data**
- **Roadway Data**
  - Area type
  - Number of lanes
  - Functional class
  - Speed limit
  - Shoulder width
- **Horizontal curves**
- **Elevation data**

Systemic Approach



Overrepresentation

- to determine ***focus crash types*** most relevant to region

Crash Trees

- to determine ***focus facility types***

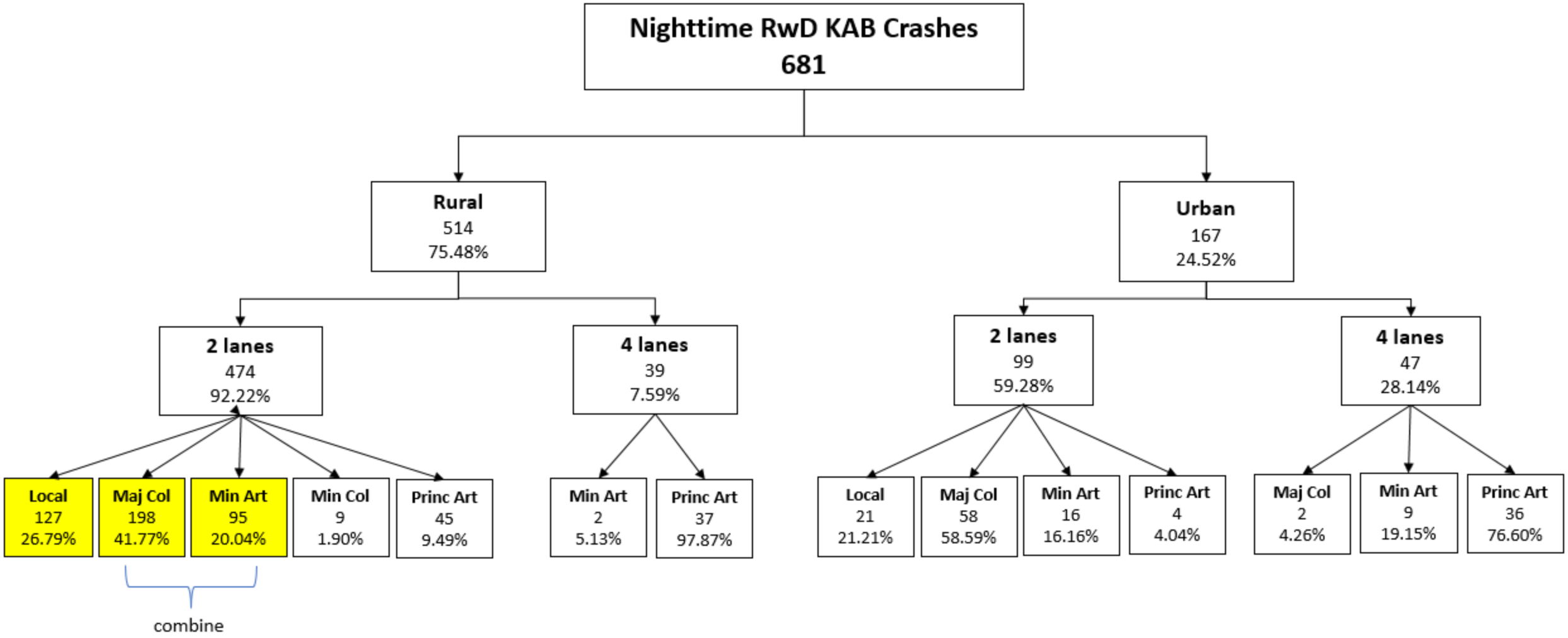
Focus Crash Types

Characteristic Type	Characteristic	KA RwD Crashes		BCO RwD Crashes	
		Number of crashes	%	Number of crashes	%
Collision Type	Barrier	15	3.09%	677	7.48%
	Curb, ditch, embankment	98	20.21%	2284	25.22%
	Head-on	100	20.62%	1298	14.33%
	Other	16	3.30%	1103	12.18%
	Other fixed object	12	2.47%	523	5.78%
	Post and poles	26	5.36%	999	11.03%
	Rollover	39	8.04%	263	2.90%
	Trees	179	36.91%	1909	21.08%
Light Conditions	Daylight	239	49.28%	4682	51.70%
	Night	246	50.72%	4374	48.30%
Road Surface Condition	Dry	399	82.27%	7026	77.58%
	Wet	86	17.73%	2030	22.42%
DUI Involved	No	333	68.66%	8092	89.36%
	Yes	152	31.34%	964	10.64%
Speeding Involved	No	217	44.74%	6424	70.94%
	Yes	268	55.26%	2632	29.06%
Total Unbelted	0	283	58.35%	8,522	94.10%
	1	162	33.40%	460	5.08%
	2	22	4.54%	63	0.70%
	3	10	2.06%	8	0.09%
	4	5	1.03%	1	0.01%
	5	1	0.21%	2	0.02%
	6	1	0.21%	0	0.00%
	7	1	0.21%	0	0.00%

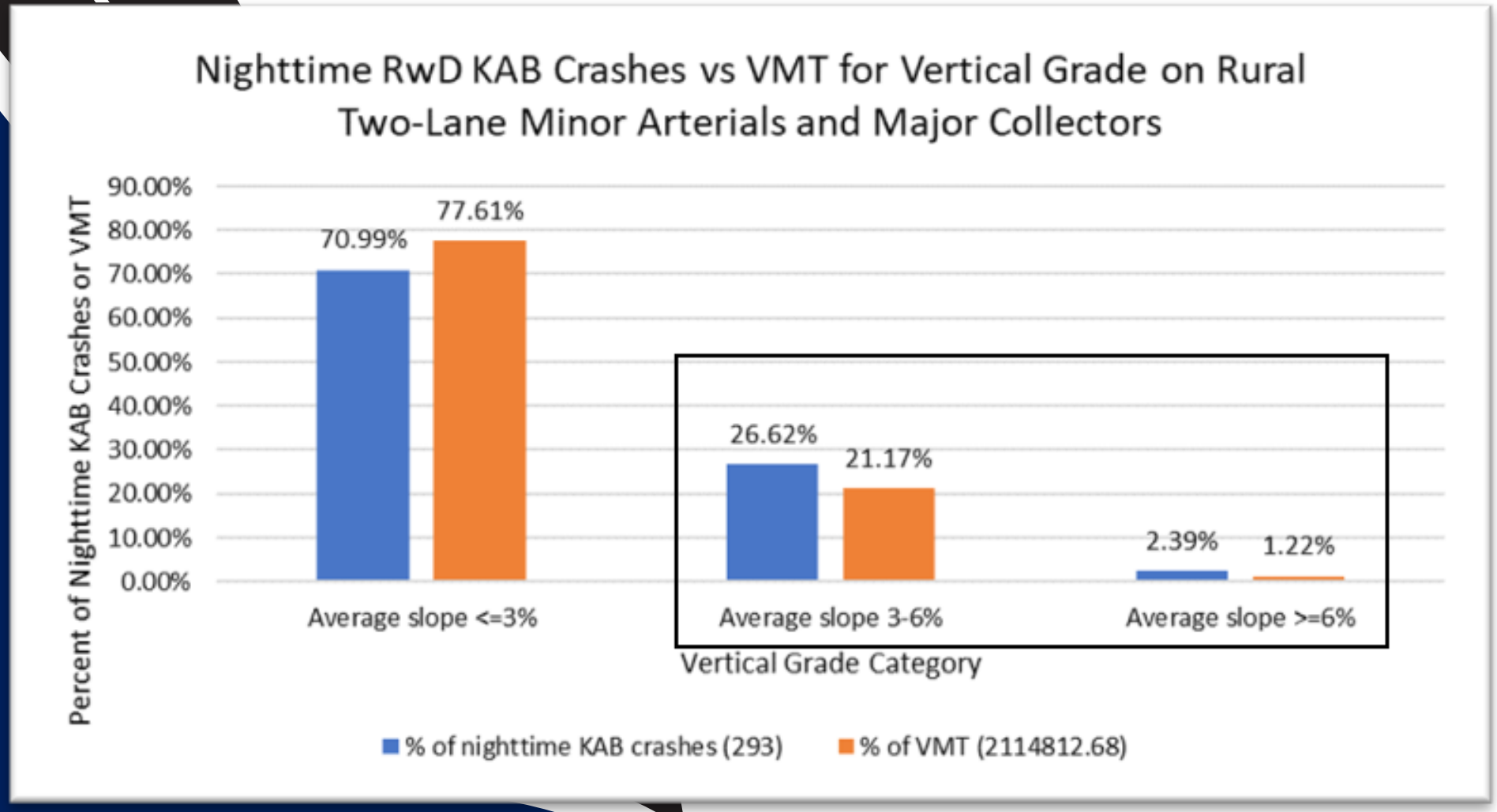
Focus crash types – **KAB rashes**

- **RwD**
- **Head-on**
- **Tree**
- **Nighttime**
- **Wet surface**
- **Speeding-related**
- **DUI-involved**

Focus Facility Types



Risk Factor Assessment



Rural Two-Lane Major Collector/Minor Arterial Risk Factor Results

Focus Crash Type	Population	Posted Speed	Grade	Curve Radius	AADT	Route Type
Head-on	> 1,000 [1]	35 – 45 mph [1]	≤ 3 percent [1]	≤ 600 ft [1]	> 4,000 [1]	
Tree			> 3 percent [1]	≤ 600 ft [2] 601 – 1,000 ft [1]	≤ 1,000 [2] 1,001 – 2,000 [1]	Secondary [2]
Nighttime			> 3 percent [1]	≤ 600 ft [2] 601 – 1,000 ft [1]	≤ 500 [1] 501 – 2,000 [2]	Secondary [2]
Wet Surface				≤ 300 ft [2] All other curves [1]	≤ 2,000 [2]	Secondary [2]
Speeding	*Abbeville or Laurens [1]		> 3 percent [1]	≤ 600 ft [1]	≤ 1,000 [2] 1,001 – 2,000 [1]	Secondary [2]
DUI	≤ 1,000 [1] *Abbeville, Greenwood, Laurens [1]			≤ 600 ft [2]	≤ 500 [1] 501 – 2,000 [2]	Secondary [2]

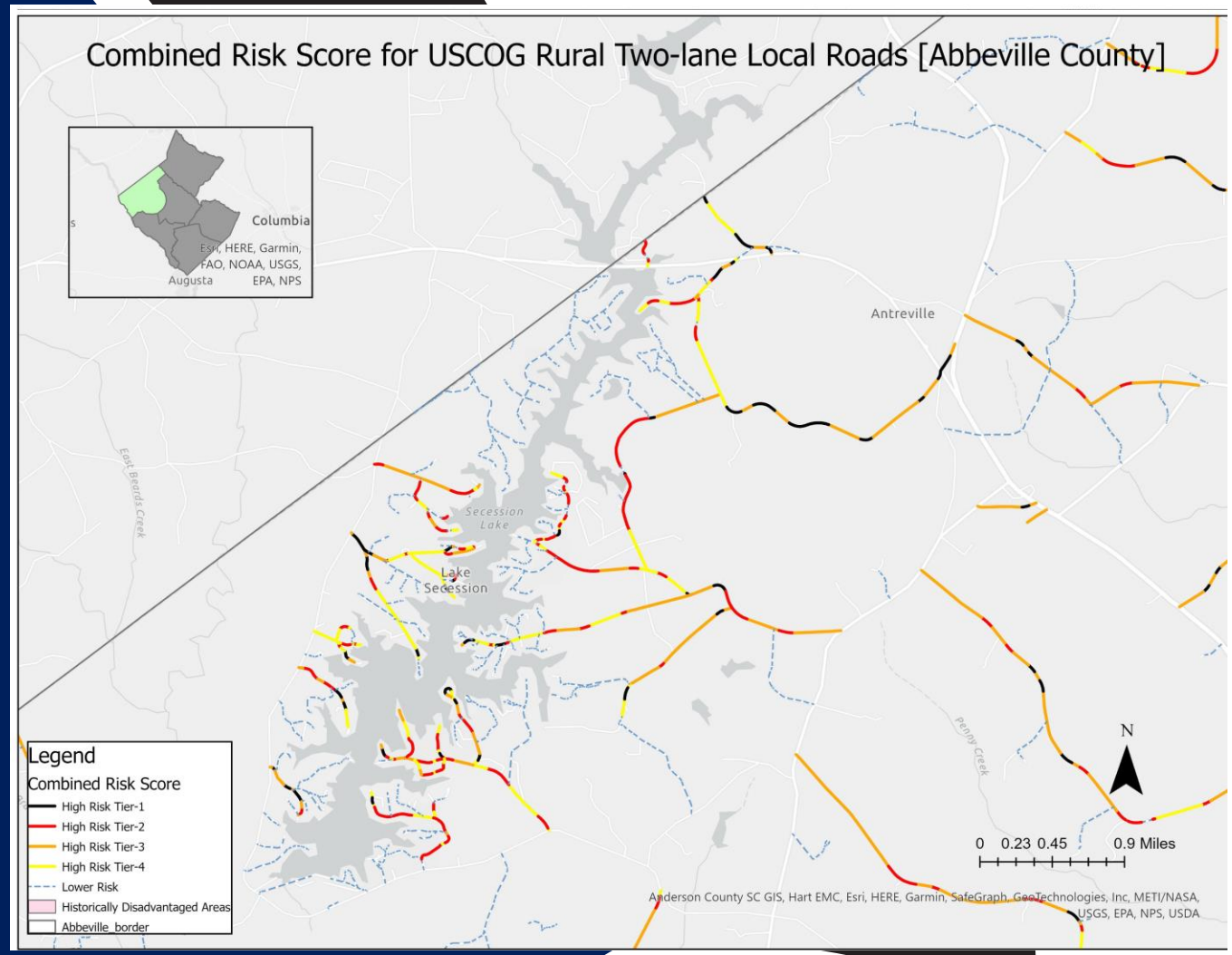
Rural Two-Lane Major Collector/Minor Arterial Curve Risk Factor Results

Focus Crash Type	Grade	Curve Radius	AADT	Route Type	County
All RwD	> 3 percent [1]	≤ 300 ft [2] 301 – 600 ft [1]	≤ 1,000 [2] 1,001 – 2,000 [1]	Secondary [2]	
Tree	> 3 percent [1]	≤ 300 ft [2] 301 – 1,000 ft [1]	≤ 1,000 [2] 1,001 – 2,000 [1]	Secondary [2]	
Nighttime	> 3 percent [1]	≤ 600 ft [2]	≤ 500 [1] 501 – 2,000 [2]	Secondary [2]	
Speeding	> 3 percent [1]	≤ 300 ft [2] 301 – 600 ft [1]	≤ 1,000 [2] 1,001 – 2,000 [1]	Secondary [2]	Abbeville, Edgefield, McCormick [1]

Rural Two-Lane Local Road Risk Factor Results

Focus Crash Type	Population	County	Grade	Curve Radius	AADT	Route Type
All RwD (curves)	≤ 1,000 [1]		≤ 3 percent [2]	300 ft – 600 ft [1]	501 – 1,000 [1]	Secondary [2]
Tree			≤ 3 percent [1]	≤ 600 ft [2]	501 – 1,000 [1]	Secondary [2]
Nighttime			3 – 6 percent [1]	≤ 1,000 ft [1]	501 – 1,000 [1]	Secondary [2]
Speeding	2,500 – 4,999 [1]	Abbeville, Greenwood, or Laurens [1]	≤ 3 percent [1]	≤ 300 ft [1]	501 – 1,000 [1]	Secondary [2]

Prioritization



High Risk Tier-1

High Risk Tier-2

High Risk Tier-3

High Risk Tier-4

Lower Risk

Roadway Departure Countermeasures

Roadway Departures: Countermeasures

1st - Keep vehicles on the road

2nd - Reduce the potential for crashes

3rd - Minimize the severity

Roadway Departures: Countermeasures

Curve Signing
Pavement Markings
Delineators
Friction Treatments
Rumbles
Lighting

1st - Keep vehicles on the road

2nd - Reduce the potential for crashes

3rd - Minimize the severity

Source: MUTCD

Roadway Departures: Countermeasures

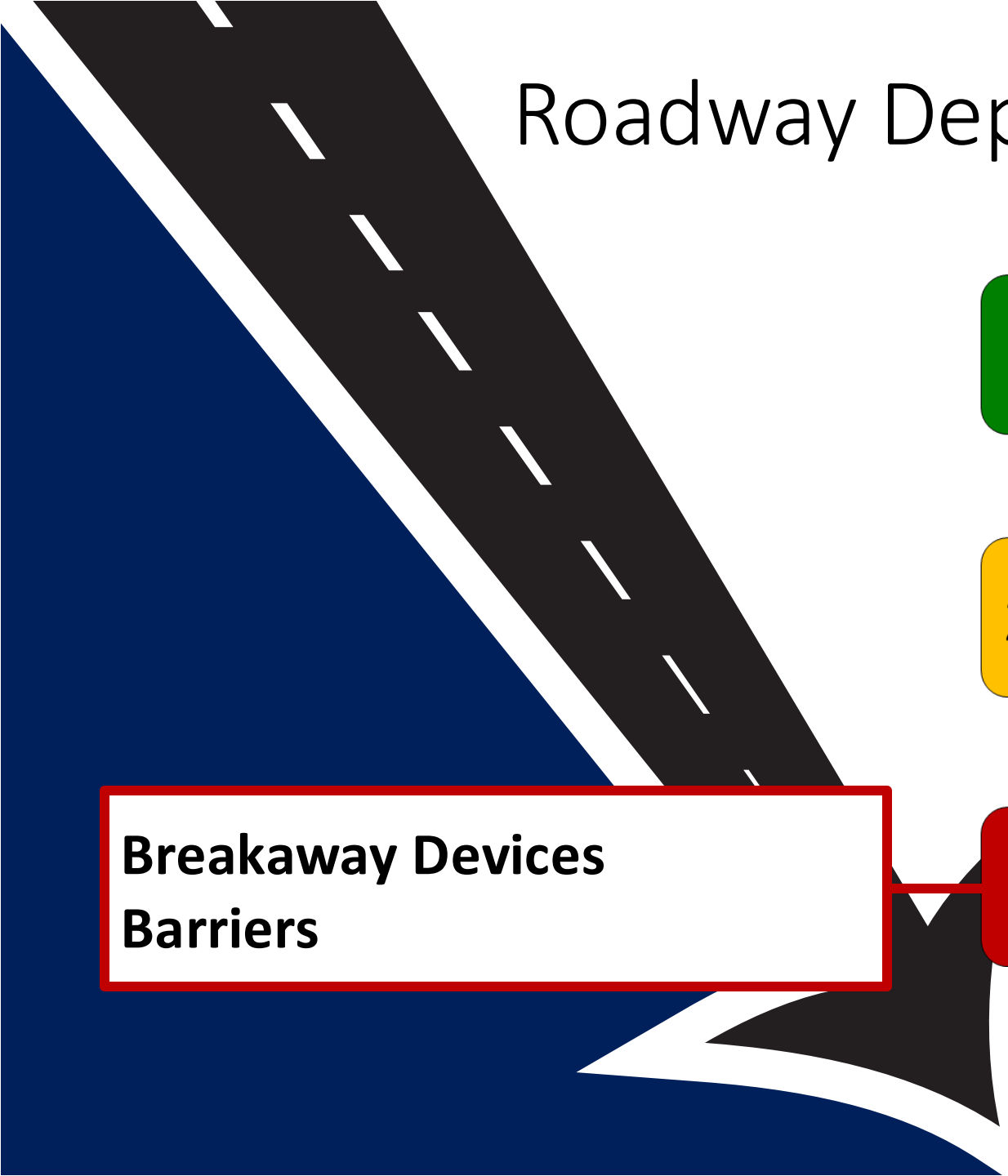
Shoulders
SafetyEdge^{SM}
Center Line Buffer
Clear Zone
Traversable Slopes

1st - Keep vehicles on the road

2nd - Reduce the potential for crashes

3rd - Minimize the severity

Roadway Departures: Countermeasures



1st - Keep vehicles on the road

2nd - Reduce the potential for crashes

3rd - Minimize the severity

Breakaway Devices
Barriers

Questions?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