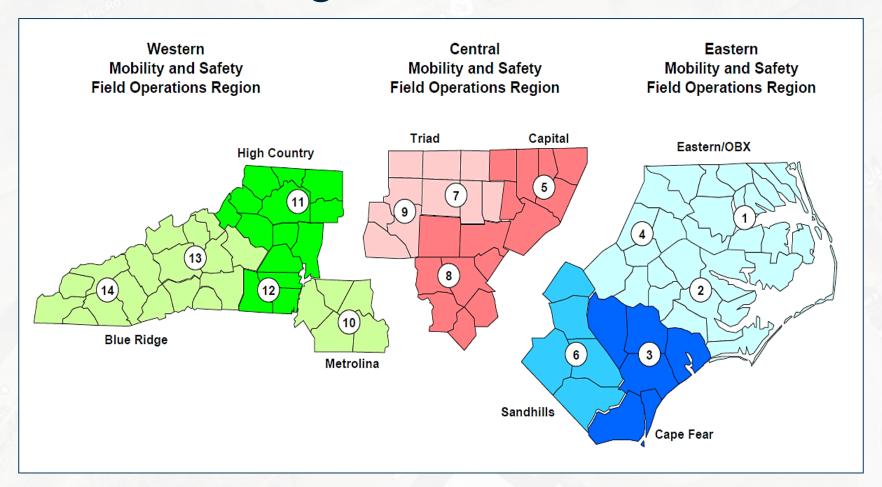


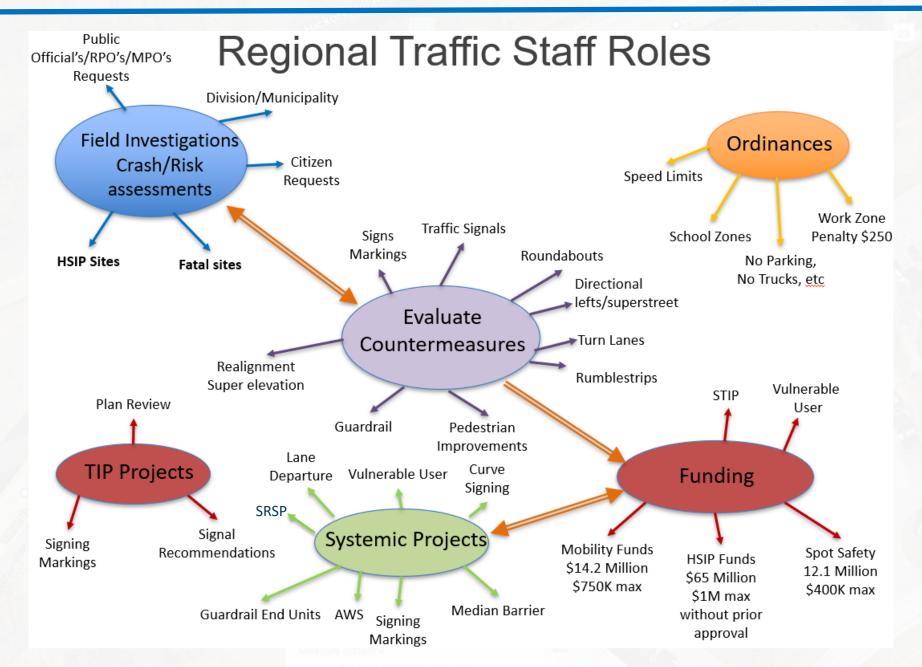
Regional Safety Initiatives for NCDOT's Western Region Division 10 - 14

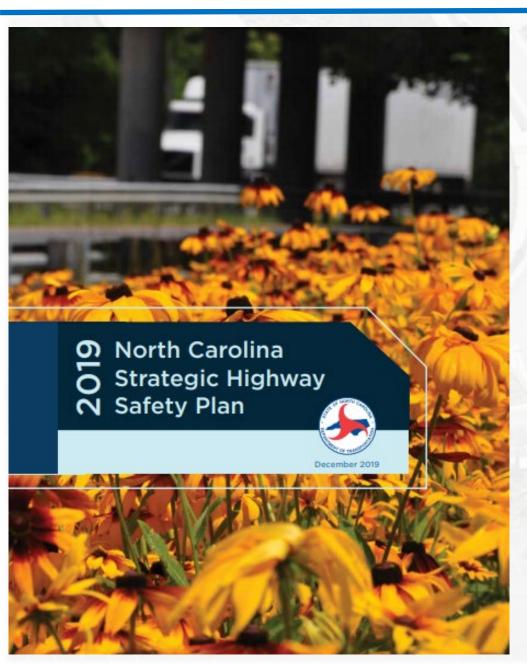
Scott M. Collier, PE Western Regional Field Operations Engineer October 2023

Connecting people, products and places safely and efficiently with custom er focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina

NCDOT Regional Traffic Offices





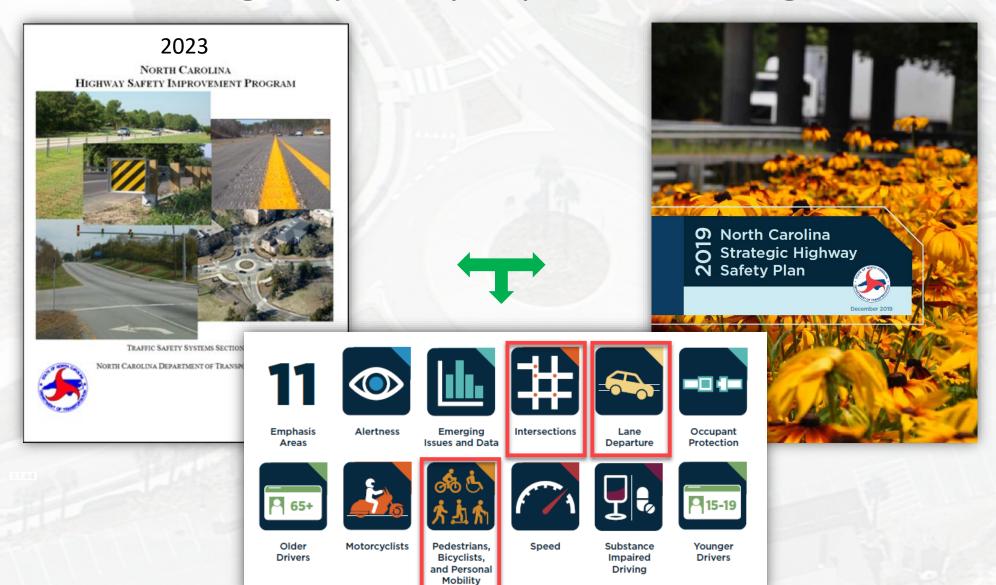


SHSP Goal

 Reduce <u>all</u> fatalities and serious injuries by half by 2035, moving towards zero by 2050.



NC Highway Safety Improvement Program



NC Highway Safety Improvement Program

Fatality and Serious Injury share by SHSP emphasis areas

Roadway Departure **55%**

Intersection 31%

Pedestrian & Bike
18%

Time to Next Fatality or Serious Injury

1144

Roadway Departure

2.6 Hours

Intersection
4.0 Hours

Pedestrian & Bike

13.4 Hours

Safety Program Funding Targets

Roadway Departure **50%**

Intersection 35%

Pedestrian & Bike 15%

- Correlates with approximate share of fatal and serious injures by SHSP emphasis area
- Emphasis area goals are soft targets with flexibility
- Projects will be considered within context of Emphasis areas
 - Road Departure, Intersection, and Pedestrian & Bike

Safety Funding Sources

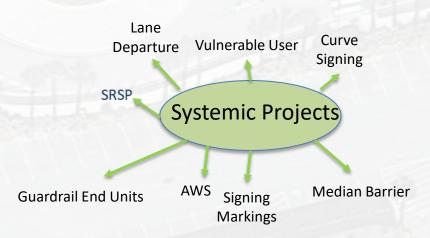
HSIP	Spot Safety	Spot Mobility
\$+65M Per Year	\$12.1M Per Year	\$14.2M Per Year
Federal Funds	State Funds	State Funds
Soft cap of \$1M per project (Projects above \$1M require advanced authorization from the State Traffic Engineer)	\$400K cap per project	\$750K cap per project
B/C based prioritization and systemic investments	Prioritization is based on the Spot Safety Index that includes B/C ratio	Prioritization is based on the Spot Mobility Index including B/C ratio based on delay savings
Selected bi-annually	Selected quarterly	Selected quarterly



FOCUSING ON RURAL ROADWAYS:

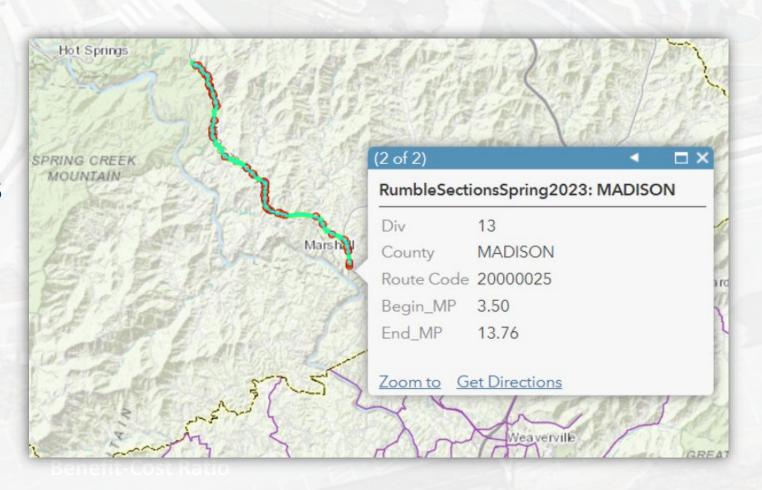
"Between 2014 and 2018, approximately 60% of all crashes occurred in an urban setting, while 70% of fatalities occurred on rural roads."

How do we target this?



Lane Departure Initiative

- Administered through our HSIP Program
- 3000' segments with 4 or more lane departure crashes
- Two-lane roadways
- Outside city/town limits
- Speed Limit greater than
 35-mph
- ADT greater that 500





Secondary Road Safety Program (SRSP)

- Administered by our HSIP Group
- Ranks all secondary roads with 55-mph speed limits
- Ranking is based on crash counts with an emphasis on fatal and serious injury crashes
- Intent is to have an engineered speed limit on all secondary roads
- Initially 40,000 miles of routes with statutory 55-mph speed limits



Curve Signing Program

- Goal is to identify curves that may benefit from additional signing
- Extended 3000' segments
 with 4 or more lane
 departure crashes in 5 years
- Two-lane roadways
- Speed Limit of 45-mph or greater
- PEFs used to lower workload
- 2009 MUTCD compliance



Curve Signing Program (cont.)

County:	McDowell County				
Route:	SR 1168 (Ashworth Road)				
Location Description:	Between MP 2.006 and MP 3.882				
Date of Investigation:	5				
Investigated By:	8/8/2023				
Curve Number:	7				
GPS Coordinates:	35.636402° -82.004774°				
Milepost:	2.6				
Speed Limit (mph):	45				
	Ballbank Readings				
Speed (mph)	Eastbound	Westbound	Northbound	Southbound	
55					
50					
45	- 1				
40	18	23.4			
35	13.9				
30	10.3	12.9	1		
25		8.5			
20	1				
15					
10					

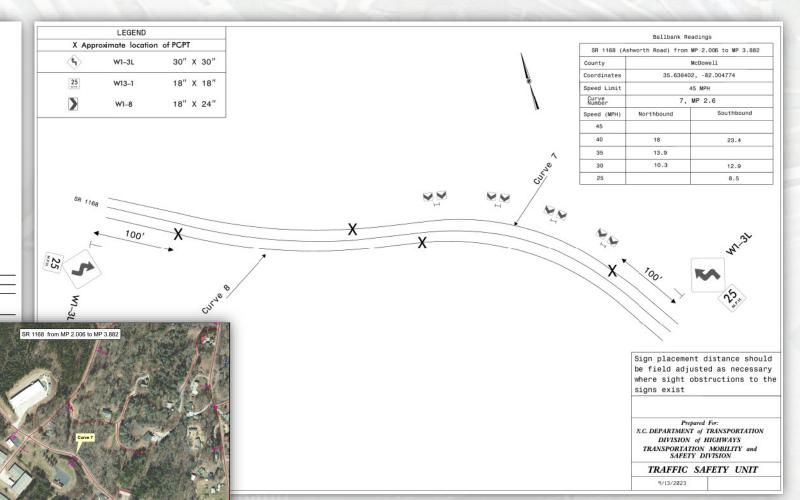
Existing signage (list all signs related to the curve area):

Other issue/discussion items:

Recommendation for new signing:

Reverse Turn warning sign w/ 25 MPH advisory

Sign maintenance recommendations:



All Way Stop Program

- Administered through our HSIP Program
- Approximately 400 intersections identified
- Upper limit of 7,500 ADT on both the major and minor street
- Average cost is \$20-30K
- No speed limit maximum



HSIP – All Way Stop – Current Efforts

Overall Results from 348 Intersections Indicate Significant Crash Reductions with AWS:

- Total crashes per year: 55% Reduction
- Frontal Impact crashes per year: 65% Reduction

Injury Crashes Significantly Reduced with AWS:

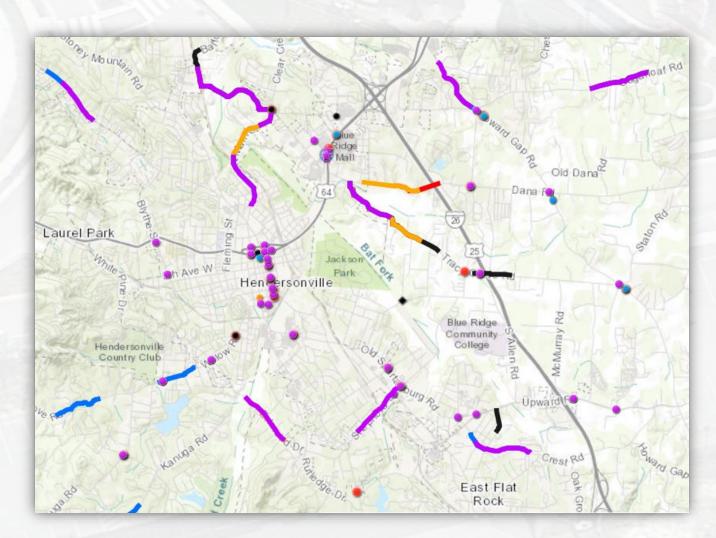
- Fatal and Class-A injury crashes per year: 92% Reduction
- Class-B and Class-C injury crashes per year: 72% Reduction
- Before AWS, there were 81 fatal crashes and 165 Class-A injury crashes
- After AWS, there were **NO fatal crashes** and 8 Class-A injury crashes

Overwhelming Effectiveness Across AWS Sites:

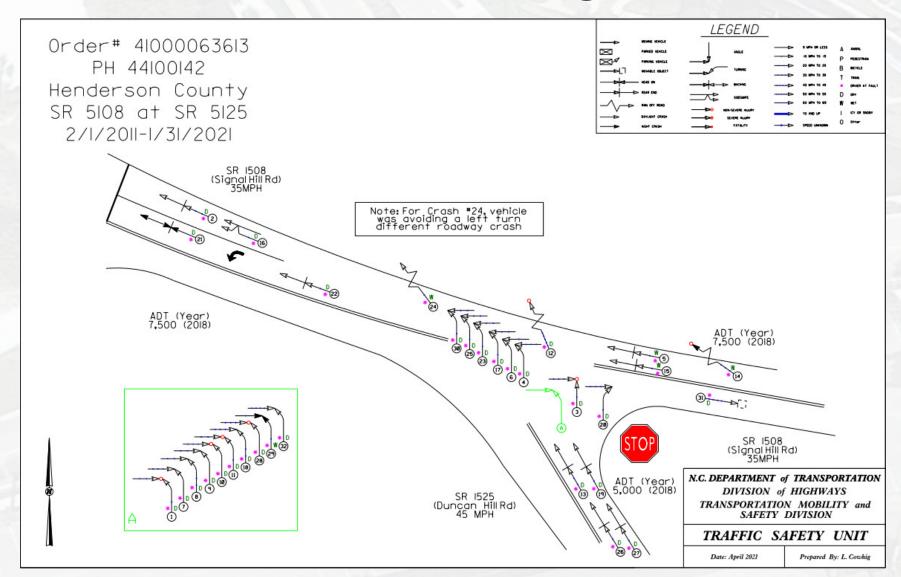
- 84% of intersections saw reductions in total crashes
- 89% of intersections saw reductions in frontal impact crashes
- 90% of intersections saw reductions in fatal and injury crashes

Highway Safety Improvement Program (HSIP)

- Implement Effective Safety Projects
- Reduce Fatalities and Injuries
- Maximize Value (low cost, high returns)
- Get safety projects "On the Ground"
- Intersection, Section,
 Bike/Pedestrian, Bridge



HSIP – Collision Diagram



Before & After







Benefit-C

Before and After – Bridge Location





11144

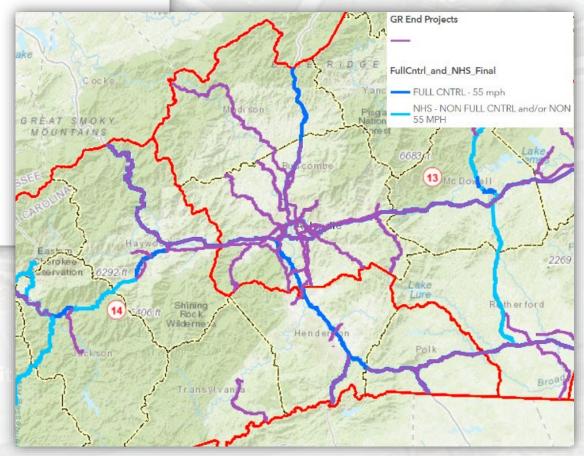
Benefit-Cost Ratio

Guardrail End Unit Replacement Program (Pre-NCHRP 350)

Replacement of pre NCHRP 350 guardrail end units

Tiered review and replacement approach that began in 2016-2017

- Interstates
- Full Control Highways and NHS Routes
- US Routes
- NC Routes
- SR Routes



Pre-NCHRP 350 Guardrail End Units – TO BE REPLACED



Benefit-Cost Ratio

Approved Energy Absorbing Guardrail End Units (MASH)







Standard Guardrail Installation Projects





- Non-Systemic Projects, installed systemically
- Over 13 miles of guardrail funded in the last 2 yrs in the BRR

Rural Vulnerable User Projects



Swain County Northwest of Robbinsville Deals Gap – Tail of the Dragon

Deep Creek Campground North of Bryson City Swain County



Thank you!

Scott M. Collier, PE

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