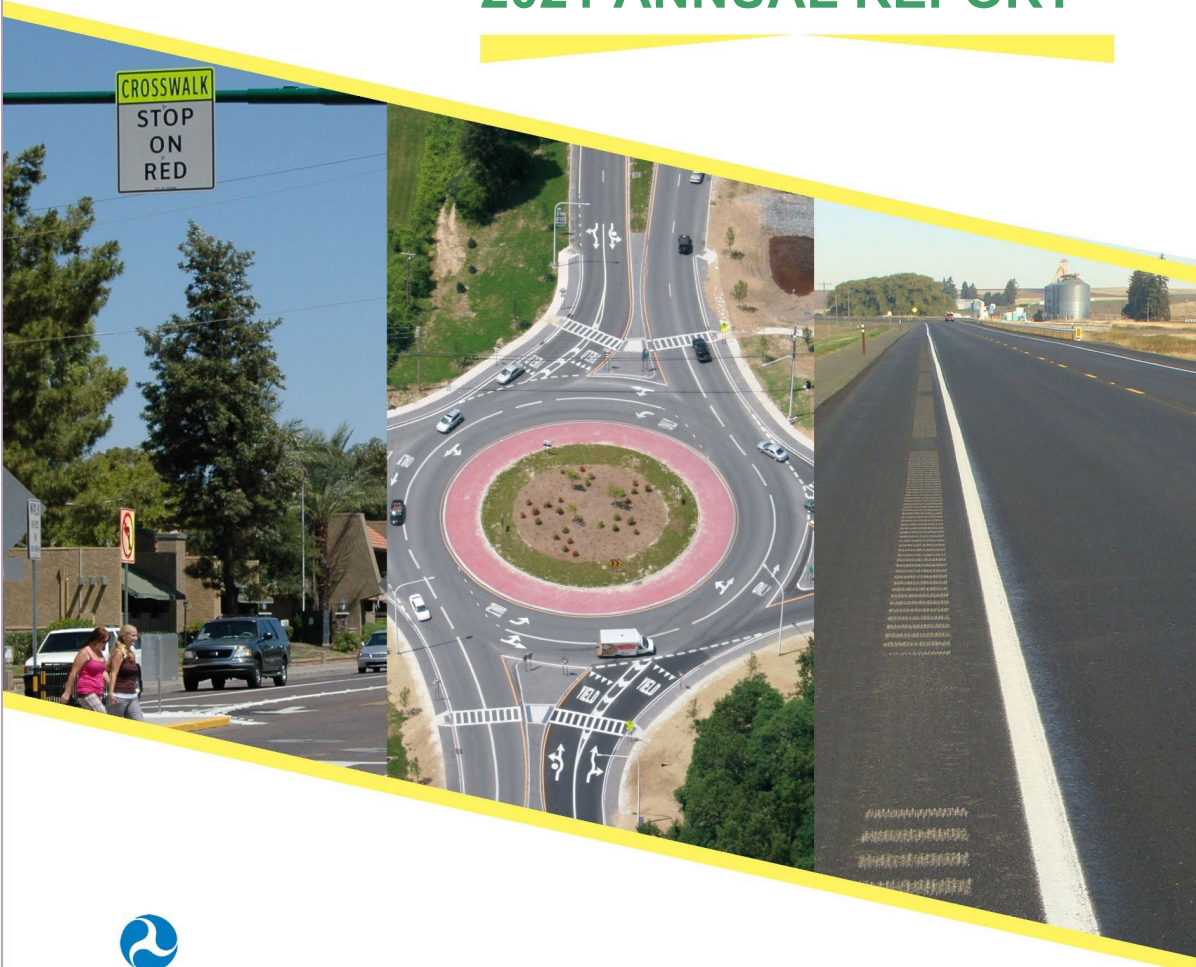




NORTH CAROLINA

# HIGHWAY SAFETY IMPROVEMENT PROGRAM 2021 ANNUAL REPORT



U.S. Department of Transportation  
Federal Highway Administration

Photo source: Federal Highway Administration

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## **Disclaimer**

### ***Protection of Data from Discovery Admission into Evidence***

23 U.S.C. 148(h)(4) states “Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for any purpose relating to this section[HSIP], shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location identified or addressed in the reports, surveys, schedules, lists, or other data.

23 U.S.C. 148(h)(4) states “Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for any purpose relating to this section[HSIP], shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location identified or addressed in the reports, surveys, schedules, lists, or other data.23 U.S.C. 409 states “Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway-highway crossings, pursuant to sections 130, 144, and 148 of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.”

## Executive Summary

The purpose of the North Carolina Highway Safety Improvement Program (HSIP) is to provide a continuous and systematic procedure that identifies, investigates, and addresses specific safety concerns throughout the state. The goal of the HSIP is to reduce the number of traffic crashes, injuries, and fatalities by reducing the potential for and the severity of these incidents of public roadways.

North Carolina recognizes traffic crashes as a significant problem that continues to challenge the state. In 2020, there were over 273,000 reported traffic crashes that resulted in 1,658 fatalities, 4,947 severe injuries, 281 non-motorized fatalities and 396 non-motorized severe injuries on our roadways. The socioeconomic impact of these crashes is severe, resulting in a loss of over \$31 billion to the economy of North Carolina annually. This impact translates to a crash cost to the state of over \$3.6 million every hour and approximately \$84 million every day and a staggering social impact as well. In 2020, North Carolina had a population of over 10.4 million, and an estimated average annual vehicle miles traveled of 1059.22 (100 MVMT). Based on 2020 data, the following are summary thoughts for 2020:

- Total crashes are on a decreasing trend, likely because of COVID
- VMT is on a decreasing trend, likely because of COVID
- Population is on a slightly decreasing trend (~0.5% or 49,000 less in 2020 vs. 2019)
- Total fatalities are on an increasing trend: Fatalities have increased from 1,470 in 2019 to 1,658 in 2020, an increase of over 12 percent
- Total severe injuries are on an increasing trend: This resulted in severe injuries increasing from 4,897 in 2019 to 4,947 in 2020, an increase of over 1 percent
- Non-motorized fatalities are on an increasing trend: This resulted in fatalities increasing from 254 in 2019 to 281 in 2020, an increase of over 10 percent.
- Non-motorized severe injuries are on a slightly decreasing trend:

The North Carolina highway mileage in 2020 was 80,212 miles (74 percent) of state-maintained roads and 27,689 miles (26 percent) of non state-maintained roads. State maintained roads include interstates, US routes, NC routes, and secondary routes. Secondary routes comprise of over 81 percent of the state-maintained roads. Non state-maintained roads include municipal, federal, and other state agency roads. Municipal roads comprise of over 84 percent of the non state-maintained roads. In 2020, 79 percent of the fatalities occurred on state-maintained roads and 21 percent occurred on non state-maintained roads. The following bullets are how the 2020 fatalities disaggregate by road classification, local roads are non state-maintained.

- Interstate - 10.0% of total, 52.7% rural, 0.0% rural 2-lane
- US route - 18.8% of total, 72.5% rural, 50.0% rural 2-lane
- NC route - 20.8% of total, 81.5% rural, 89.6% rural 2-lane
- Secondary route - 29.8% of total, 95.7% rural, 97.9% rural 2-lane
- Local Street - 20.6% of total, 100.0% urban, 43.5% urban 2-lane

Based on this data review, most North Carolina fatalities occur on rural 2-lane state-maintained roads.

North Carolina has established a vision to have a multi-disciplinary, multi-agency highway safety approach to research, planning, investigation, design, construction, maintenance, operation, and evaluation of transportation systems, which results in reduced fatalities, injuries, and economic losses, related to crashes. In addition, there is a coordinated strategic effort to address emerging safety issues. In 2019, North Carolina updated the 2014 Strategic Highway Safety Plan (SHSP) in coordination through the Executive Committee for Highway Safety. The goal established in the 2019 SHSP are to reduce fatalities and serious injuries by half by 2035 based on 2018 data and moving towards zero by 2050.

## 2021 North Carolina Highway Safety Improvement Program

This “HSIP Report” describes North Carolina DOT’s implementation and effectiveness of its Highway Safety Improvement Program. These reports satisfy the requirements under Title 23 of the Code of Federal Regulations, Part 924 (23 CFR 924). The NCDOT Rail Division is developing the “Railway-Highway Crossing Report” as a separate report submission. North Carolina DOT has opted to use the 2020 Calendar Year as the reporting period for the “HSIP Report”; however, some of our 2021 plans, goals, and methods are included in this report.

## **Introduction**

The Highway Safety Improvement Program (HSIP) is a core Federal-aid program with the purpose of achieving a significant reduction in fatalities and serious injuries on all public roads. As per 23 U.S.C. 148(h) and 23 CFR 924.15, States are required to report annually on the progress being made to advance HSIP implementation and evaluation efforts. The format of this report is consistent with the HSIP Reporting Guidance dated December 29, 2016 and consists of five sections: program structure, progress in implementing highway safety improvement projects, progress in achieving safety outcomes and performance targets, effectiveness of the improvements and compliance assessment.

## **Program Structure**

### ***Program Administration***

#### **Describe the general structure of the HSIP in the State.**

Each year the Transportation Mobility and Safety Division (TMSD) conducts network screening to identify potentially hazardous intersections and sections. Crash data and collision diagrams are compiled for the higher ranked locations. These tools are then used to conduct field investigations of these sites. NCDOT staff also conduct numerous field investigations resulting from specific fatal sites and concerns from law enforcement, municipalities and citizens. Data from the field investigation is used to determine feasible countermeasures. In many cases low-cost countermeasures can be funded by highway maintenance programs. Other improvements are developed into projects that compete for state and federal highway safety program funds. Selection of projects is determined by a statewide data-driven selection process each quarter. The selected projects are approved by the NCDOT Board of Transportation. Project designs are developed and contracts are advertised. Contracts are awarded and projects are constructed, then final field inspections are conducted by division and/or TMSD personnel to make sure that the project is completed according to the approved plans and specifications. All significant safety projects are evaluated individually and once enough projects of a particular countermeasure have been implemented, the effectiveness of the countermeasure is evaluated.

#### **Where is HSIP staff located within the State DOT?**

##### **Operations**

NCDOT's Traffic Safety Unit has approximately 40 positions dedicated to improving safety and mobility. There are also Traffic Engineering staff in the 14 Highway Divisions who are charged with maintaining and improving our transportation network.

#### **How are HSIP funds allocated in a State?**

- Central Office via Statewide Competitive Application Process

The HSIP program is funded with 90% federal funds and 10% matching state funds. Competing HSIP candidate projects are submitted and reviewed quarterly by an interdisciplinary Safety Project review team that recommends approval of federally funded safety projects. These projects are prioritized for funding according to a safety benefit-to-cost (B/C) ratio, with the safety benefit being based on crash and injury reductions. Once programmed HSIP (W-Projects) become part of NCDOT's State Transportation Improvement Program (STIP). NCDOT has also funded systemic Vulnerable User, Pedestrian and Bicycle, and Signal System projects.

## **Describe how local and tribal roads are addressed as part of HSIP.**

In North Carolina, the local county governments are not responsible for the maintenance of rural highways. The NCDOT highway network covers nearly 80,000 roadway centerline miles which includes rural roadways classified as local; municipal governments maintain some downtown streets, residential streets and subdivision roads.

Several communities including several Planning Organization staff have been formally trained in identifying low cost countermeasures with the ultimate goal of reducing fatalities and serious injuries in their cities. Technical training included understanding crash data, identifying potential treatment locations, preparing collision diagrams, selecting countermeasures, and evaluating those countermeasures. Quarterly conference calls are being held to allow city representatives to brainstorm ideas and offer feedback on the program. A process was established to federally fund some of these projects through the Local Programs Management Office (LPMO). By training these municipalities to analyze, identify treatments, and set up and evaluate projects, the municipalities should see reductions in the severity and number of crashes on their roadways.

NCDOT receives crash data from the Department of Motor Vehicles and has the capability to identify potentially hazardous locations on all publicly traveled North Carolina roadways.

We are not aware of any crashes on tribal roads and are not certain if they are required to report crashes. We will make a concerted effort to reach out to tribes to determine the number and severity of crashes on their roadways, as well as identify potentially hazardous locations.

## **Identify which internal partners (e.g., State departments of transportation (DOTs) Bureaus, Divisions) are involved with HSIP planning.**

- Design
- Governors Highway Safety Office
- Operations
- Planning
- Traffic Engineering/Safety

The design, planning, and operations units within NCDOT play a significant role within the Strategic Highway Safety Plan. These units utilize safety data during their planning phase in many ways. NCDOT's Strategic Prioritization process uses data regarding pavement condition, traffic congestion and road safety, as well as input from local government and NCDOT staff to determine transportation priorities. Many resurfacing projects are utilizing safety edge treatments to reduce the potential for over-correction type crashes. The Governor's Highways Safety Program oversees a variety of important safety campaigns, including "Booze It and Lose It" and "Click It or Ticket It.". The NCDOT Rail Division and GHSP participate on our safety project selection committee. The Transportation Mobility and Safety Division, GHSP, and the State Highway Patrol (external partner) have developed a collaborative program to identify and improve rural highway corridors that have high fatal and serious injury rates.

## **Describe coordination with internal partners.**

The design, planning, and operations units within NCDOT play a significant role within the Strategic Highway Safety Plan. These units utilize safety data during their planning phase in many ways. NCDOT's Strategic Prioritization process uses data regarding pavement condition, traffic congestion and road safety, as well as input from local government and NCDOT staff to determine transportation priorities. Many resurfacing projects are utilizing safety edge treatments to reduce the potential for over-correction type crashes. The Governor's Highways Safety Program oversees a variety of important safety campaigns, including "Booze It and Lose It" and "Click It or Ticket It.". The NCDOT Rail Division and GHSP participate on our safety project selection

## 2021 North Carolina Highway Safety Improvement Program

committee. The Transportation Mobility and Safety Division, GHSP, and the State Highway Patrol (external partner) have developed a collaborative program to identify and improve rural highway corridors that have high fatal and serious injury rates.

### **Identify which external partners are involved with HSIP planning.**

- Local Government Agency
- Regional Planning Organizations (e.g. MPOs, RPOs, COGs)
- Other-NC State Highway Patrol

Planning Organizations utilize traffic safety data to develop and prioritize transportation plans. Members of the NC State Highway Patrol and local government transportation agencies also regularly participate in NCDOT's Road Safety Audit Program. The NC Transportation Secretary chairs the NC Executive Committee for Highway Safety and partner agency representatives are actively involved in the committee. The partner agency representatives currently includes members from the following: NC Conference of District Attorneys, UNC Highway Safety Research Center, City of Greensboro, NC Association of MPOs, FMCSA, NCSHP, Students Against Destructive Decisions (SADD), FHWA, NC Department of Health and Human Services, AARP, AAA Carolinas, NC Department of Insurance and Eastern Carolina Injury Prevention Program.

### **Describe coordination with external partners.**

Planning Organizations utilize traffic safety data to develop and prioritize transportation plans. Members of the NC State Highway Patrol and local government transportation agencies also regularly participate in NCDOT's Road Safety Audit Program. The NC Transportation Secretary chairs the NC Executive Committee for Highway Safety and partner agency representatives are actively involved in the committee. The partner agency representatives currently includes members from the following: NC Conference of District Attorneys, UNC Highway Safety Research Center, City of Greensboro, NC Association of MPOs, FMCSA, NCSHP, Students Against Destructive Decisions (SADD), FHWA, NC Department of Health and Human Services, AARP, AAA Carolinas, NC Department of Insurance and Eastern Carolina Injury Prevention Program.

### **Describe other aspects of HSIP Administration on which the State would like to elaborate.**

The North Carolina Strategic Highway Safety Plan (SHSP) (herein referred to as the Plan) is essential to addressing highway safety in our State. The Plan is a key component of North Carolina's Highway Safety Improvement Program, a core-Federal-aid program directed at reducing fatalities and serious injuries on all public roads. North Carolina's Executive Committee for Highway Safety first developed the SHSP in 2004. Updates in 2006 and 2014 were implementation focused, identifying significant contributing factors in crashes and implementation strategies with the most potential to address those crashes. Information about the previous Plan, developed in 2014, can be found here . In 2015, the Federally funded legislation Fixing America's Surface Transportation Act continued the requirements that States develop an SHSP that is data- and multidisciplinary stakeholder-driven and that analyzes highway safety concerns and identifies opportunities to improve safety on all public roads. The 2019 Plan is an update to the 2014 Plan and the fourth iteration of the Plan since 2004, and the first 5-year update under recent Federal regulations.

The North Carolina Department of Transportation updated the SHSP in 2019 through the collaborative efforts of diverse safety stakeholders representing the users of State's highway system and encompassing the 4 E's of highway safety—education, enforcement, engineering, and emergency services. These safety stakeholders include State, regional, local, and tribal agencies, as well as other public and private partners. This Plan presents a statewide, comprehensive, and collaborative approach for reducing fatalities and serious injuries on North Carolina's roadways.



## 2021 North Carolina Highway Safety Improvement Program

The Plan is organized by Focus Areas, which group Emphasis Areas addressing similar crash types, road users, or other characteristics. This framework supports the importance of overlaps and provides a roadmap for implementation. Safety partners representing the Emphasis Areas will work together under the umbrella of the Focus Area to prioritize and implement the actions in each Emphasis Area Action Plan. The following briefly introduces the Focus Areas and corresponding Emphasis Areas.

- Roadway Infrastructure
  - Intersections
  - Lane Departure
- Human Behavior
  - Alertness
  - Occupant Protection
  - Substance Impaired Driving
  - Speed
- All Users
  - Younger Drivers
  - Older Drivers
  - Motorcyclists
  - Pedestrians, Bicyclists, and Personal Mobility
- Data and Evaluation
  - Emerging Issues and Data
- Safety Culture
  - All Emphasis Areas

To achieve the Plan's goals to reduce fatalities and serious injuries by half and to move North Carolina closer to Vision Zero, significant reductions are needed in each emphasis area. In general, the goal for each emphasis area is to reduce fatalities and injuries by half. Some emphasis areas present a greater opportunity to reduce fatalities and serious injuries than others. Factors such as trends in exposure rates and the availability of effective strategies are different for each emphasis area and affect the opportunity to reduce fatalities and serious injuries. For example, several lane departure strategies are known to be effective at reducing crashes on North Carolina's roads; their increased implementation presents an opportunity to greatly reduce fatalities and serious injuries. Conversely, because motorcycle ridership is increasing in North Carolina, crash reductions from effective strategies must outpace the growth in crashes that is attributed to the increased ridership (e.g., exposure).

Overall, the strategies in the emphasis areas work collectively toward the Plan goal, with some emphasis areas expected to contribute more reductions in fatalities and serious injuries than others.

### ***Program Methodology***

#### **Does the State have an HSIP manual or similar that clearly describes HSIP planning, implementation and evaluation processes?**

No

The North Carolina DOT maintains several HSIP documents and information on <https://connect.ncdot.gov/resources/safety/Pages/NC-Highway-Safety-Program-andProjects.aspx>. This includes mapped HSIP locations from 2016-2020, HSIP Potentially Hazardous Location Detailed Reports by county, intersection reports, bike/pedestrian reports, the active spot safety project list, all safety project evaluations and the NCDOT Crash Reduction Factor list.

NCDOT last conducted an HSIP assessment in 2017. Also further details can be found in the 2021 North Carolina HSIP Implementation Plan that was completed in August 2021.

**Select the programs that are administered under the HSIP.**

- Bicycle Safety
- Intersection
- Pedestrian Safety
- Roadway Departure

**Program: Bicycle Safety**

***Date of Program Methodology: 8/31/2016***

***What is the justification for this program?***

- Addresses SHSP priority or emphasis area

***What is the funding approach for this program?***

Competes with all projects

***What data types were used in the program methodology?***

Crashes

Exposure

Roadway

- Other-Bicycle Crashes

***What project identification methodology was used for this program?***

- Crash frequency
- Other-Bicycle Crashes

***Are local roads (non-state owned and operated) included or addressed in this program?***

Yes

***Are local road projects identified using the same methodology as state roads?***

Yes

***How are projects under this program advanced for implementation?***

- Competitive application process
- selection committee

***Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).***

Rank of Priority Consideration

Ranking based on B/C:1

**Program: Intersection**

***Date of Program Methodology:5/31/2019***

***What is the justification for this program?***

- Addresses SHSP priority or emphasis area

***What is the funding approach for this program?***

Competes with all projects

***What data types were used in the program methodology?***

**Crashes**

- All crashes

**Exposure**

**Roadway**

- Other-Urban/Rural Location

***What project identification methodology was used for this program?***

- Crash frequency
- Other-Frequency of Crashes during Dark Conditions
- Other-Frontal Impact Crashes
- Other-Percent Frontal Impact Crashes
- Other-Recent year Crashes
- Relative severity index

***Are local roads (non-state owned and operated) included or addressed in this program?***

Yes

***Are local road projects identified using the same methodology as state roads?***

Yes

***How are projects under this program advanced for implementation?***

- Competitive application process
- selection committee

***Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).***

**Rank of Priority Consideration**

Ranking based on B/C:1

**Program: Pedestrian Safety**

***Date of Program Methodology:8/31/2016***

***What is the justification for this program?***

- Addresses SHSP priority or emphasis area

***What is the funding approach for this program?***

Competes with all projects

***What data types were used in the program methodology?***

Crashes

Exposure

Roadway

- All crashes
- Other-Pedestrian Crashes

***What project identification methodology was used for this program?***

- Other-Pedestrian Crashes

***Are local roads (non-state owned and operated) included or addressed in this program?***

Yes

***Are local road projects identified using the same methodology as state roads?***

Yes

***How are projects under this program advanced for implementation?***

- Competitive application process

***Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).***

Rank of Priority Consideration

Ranking based on B/C:1

**Program: Roadway Departure**

***Date of Program Methodology:8/31/2016***

***What is the justification for this program?***

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- Addresses SHSP priority or emphasis area

**What is the funding approach for this program?**

Competes with all projects

**What data types were used in the program methodology?**

**Crashes**

- All crashes

**Exposure**

**Roadway**

- Other-Access Control
- Other-Route Classification

**What project identification methodology was used for this program?**

- Crash frequency
- Other-Percent Night Crashes
- Other-Percent Roadway Departure Crashes
- Other-Percent Wet Condition Crashes

**Are local roads (non-state owned and operated) included or addressed in this program?**

Yes

**Are local road projects identified using the same methodology as state roads?**

Yes

**How are projects under this program advanced for implementation?**

- Competitive application process
- selection committee

**Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).**

**Rank of Priority Consideration**

Ranking based on B/C:1

**What percentage of HSIP funds address systemic improvements?**

17

**HSIP funds are used to address which of the following systemic improvements?**

- Add/Upgrade/Modify/Remove Traffic Signal
- Install/Improve Lighting

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- Install/Improve Pavement Marking and/or Delineation
- Install/Improve Signing
- Safety Edge
- Upgrade Guard Rails

### **What process is used to identify potential countermeasures?**

- Crash data analysis
- Engineering Study
- Road Safety Assessment

Our regional traffic engineering staff annually investigate about 350 locations identified by our network screening process but other investigations are initiated by other means. Hundreds of fatal site locations are investigated each year. The Traffic Safety Unit from central headquarters also conducts approximately 8 Road Safety Audits annually utilizing independent, multi-disciplinary teams (currently, the RSR Program has been paused due to COVID-19 safety measures). Also NCDOT staff conduct numerous field investigations resulting from concerns of law enforcement, local government officials and citizens. NCDOT traffic engineers can also uncover safety issues during their study of traffic operations. Data from the numerous field investigations is used to determine feasible safety countermeasures.

### **Does the State HSIP consider connected vehicles and ITS technologies?**

No

### **Does the State use the Highway Safety Manual to support HSIP efforts?**

Yes

### **Please describe how the State uses the HSM to support HSIP efforts.**

NCDOT's Roadway Safety Management Process uses many HSM techniques for diagnosis, countermeasure selection, economic appraisal, project prioritization and safety evaluations. TSU's Alternative Analysis Initiative utilizes Highway Safety Manual (HSM) predictive methodologies to compare the expected safety performance of different project alternatives based on specific roadway design elements.

### **Describe other aspects of the HSIP methodology on which the State would like to elaborate.**

NCDOT is continuing to develop safety performance functions and will utilize the Interactive Highway Safety Design Model (IHSDM) application on future STIP projects. NCDOT is actively working on new systemic programs to implement wide edge lines, enhanced curve warning signs and safety edge treatments.

Highway Safety Improvement Program (HSIP) provides a continuous and systematic transportation network screening process that identifies, analyzes, investigates, diagnoses and treats specific traffic safety concerns throughout the state. The goal of the federally required HSIP is to reduce the number of traffic crashes, injuries, and fatalities by reducing the potential and the severity of public roadway collisions. The collaboration between HSIP Project Group Analysts and the Regional Traffic Engineers that research, investigate, recommend treatments, and develop realistic cost effective safety projects has yielded highly effective safety performance even during a time of continued growth in North Carolina.

The emphasis of the state-funded Spot Safety and federally-funded Highway Safety Improvement Programs is to identify and treat high crash and/or high severity locations with relatively low cost solutions in order to address safety concerns along NC roadways. These programs are a vital tool in improving safety at

## 2021 North Carolina Highway Safety Improvement Program

intersections and segments of roadway where safety needs have been identified by citizens, government officials, internal staff, or through one of NCDOT's safety initiatives. With these programs, Regional Traffic Engineers collaborate with designers and project managers on project scope and prioritization in order to develop realistic, time-sensitive, and cost effective projects that address safety issues.

The projects developed and constructed under these safety programs are inspected upon completion to ensure the identified safety issues have been mitigated and the project was constructed according to the plans. Management of this program by the State Traffic Engineer and his staff provide statewide consistency in treating areas in a systematic, evidence driven and needs based approach. These vital safety funding program efforts have shown an average return on investment of 14:1.

The Alternative Analysis Initiative quantifies the safety performance of different transportation project alternatives selected for study during the National Environmental Policy Act (NEPA) process. Using Highway Safety Manual (HSM) predictive methodologies, we compare the expected safety performance of different alternatives based on the specific design elements associated with each alternative (curve radius, lane widths, shoulder widths, number of driveways, grades, intersection features, etc.). The predicted crash numbers give some scale of the number of crashes to expect, but the percentages give a really good comparison regarding the effects of the specific design elements on each alternative that are expected to have on safety.

See the North Carolina 2021 HSIP implementation Plan for additional information and details.

## Project Implementation

### Funds Programmed

#### Reporting period for HSIP funding.

State Fiscal Year

Reporting period is SFY 2021 (7/1/2020 to 6/30/2021)

#### Enter the programmed and obligated funding for each applicable funding category.

FUNDING CATEGORY	PROGRAMMED	OBLIGATED	% OBLIGATED/PROGRAMMED
HSIP (23 U.S.C. 148)	\$49,081,500	\$54,511,058	111.06%
HRRR Special Rule (23 U.S.C. 148(g)(1))	\$4,726,978	\$4,726,978	100%
Penalty Funds (23 U.S.C. 154)	\$0	\$11,277	0%
Penalty Funds (23 U.S.C. 164)	\$0	\$0	0%
RHCP (for HSIP purposes) (23 U.S.C. 130(e)(2))	\$0	\$0	0%
Other Federal-aid Funds (i.e. STBG, NHPP)	\$0	\$0	0%
State and Local Funds	\$13,585,650	\$13,585,650	100%
Totals	\$67,394,128	\$72,834,963	108.07%

How much funding is programmed to local (non-state owned and operated) or tribal safety projects?

\$0

How much funding is obligated to local or tribal safety projects?

\$0

How much funding is programmed to non-infrastructure safety projects?

\$0

How much funding is obligated to non-infrastructure safety projects?

\$0

How much funding was transferred in to the HSIP from other core program areas during the reporting period under 23 U.S.C. 126?

\$0



**How much funding was transferred out of the HSIP to other core program areas during the reporting period under 23 U.S.C. 126?**

\$0

**Discuss impediments to obligating HSIP funds and plans to overcome this challenge in the future.**

NCDOT is responsible for the safety of nearly 80,000 miles of rural and urban highways. Cities, towns, other state agencies and federal agencies are responsible for over 26,000 miles of streets; most of this mileage is downtown and residential streets. While NCDOT administers HSIP funds, most municipalities are hesitant to participate due to the federal guidelines, restrictions and limitations on funding. Local governments are unwilling to administer the competitive bidding process. The complex federal safety program process and lack of flexibility discourages many opportunities to utilize the HSIP for low-cost safety projects. In some cases administrative costs may be higher than the project costs.

**Describe any other aspects of the State's progress in implementing HSIP projects on which the State would like to elaborate.**

NCDOT is utilizing and evaluating a variety of methods to improve project delivery times and reduce the overall cost of delivering HSIP projects. This includes combining multiple safety improvements in a single contract, the use of design-build delivery mechanisms for fast-track project delivery with well-defined scope, and the use of on-call contractors to facilitate immediate delivery of identified projects.

**General Listing of Projects**

List the projects obligated using HSIP funds for the reporting period.

PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST(\$)	TOTAL PROJECT COST(\$)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
HS-2002A	Pedestrians and bicyclists	Install new crosswalk	0.049	Miles	\$47700	\$0	HSIP (23 U.S.C. 148)			13,000		State Highway Agency		Pedestrians	
HS-2002B	Roadway	Rumble strips – center	15	Miles	\$405900	\$0	HSIP (23 U.S.C. 148)			26,000		State Highway Agency		Lane Departure	
HS-2003A	Intersection traffic control	Modify traffic signal – add additional signal heads	1	Intersections	\$8100	\$0	HSIP (23 U.S.C. 148)			14,000		State Highway Agency		Intersections	
HS-2003B	Roadway delineation	Longitudinal pavement markings – new	144.4	Miles	\$3701700	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
HS-2004B	Intersection geometry	Add/modify auxiliary lanes	1	Lanes	\$9000	\$0	HSIP (23 U.S.C. 148)			6,500		State Highway Agency		Intersections	
HS-2004C	Intersection traffic control	Modify control – two-way stop to all-way stop	1	Intersections	\$1800	\$0	HSIP (23 U.S.C. 148)			1,550		State Highway Agency		Intersections	
HS-2004D	Intersection traffic control	Modify control – two-way stop to all-way stop	1	Intersections	\$1800	\$0	HSIP (23 U.S.C. 148)			3,200		State Highway Agency		Intersections	
HS-2004E	Intersection traffic control	Modify control – two-way stop to all-way stop	1	Intersections	\$1800	\$0	HSIP (23 U.S.C. 148)			4,000		State Highway Agency		Intersections	
HS-2004F	Intersection traffic control	Modify control – two-way stop to all-way stop	1	Intersections	\$1800	\$0	HSIP (23 U.S.C. 148)			2,400		State Highway Agency		Intersections	
HS-2004G	Intersection traffic control	Modify control – two-way stop to all-way stop	1	Intersections	\$1800	\$0	HSIP (23 U.S.C. 148)			3,000		State Highway Agency		Intersections	
HS-2004H	Intersection traffic control	Modify control – two-way stop to all-way stop	1	Intersections	\$1800	\$0	HSIP (23 U.S.C. 148)			2,200		State Highway Agency		Intersections	
HS-2004I	Intersection traffic control	Modify control – two-way stop to all-way stop	1	Intersections	\$1800	\$0	HSIP (23 U.S.C. 148)			2,150		State Highway Agency		Intersections	
HS-2004J	Roadway delineation	Longitudinal pavement markings - remarking	366.4	Miles	\$9000	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	

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PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST(\$)	TOTAL PROJECT COST(\$)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
HS-2004K	Roadway	Rumble strips – edge or shoulder	8.5	Miles	\$2700	\$0	HSIP (23 U.S.C. 148)			15,500		State Highway Agency		Lane Departure	
HS-2005A	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	\$109800	\$0	HSIP (23 U.S.C. 148)			3,400		State Highway Agency		Intersections	
HS-2005B	Roadside	Barrier- metal	1.2	Miles	\$900	\$0	HSIP (23 U.S.C. 148)			2,800		State Highway Agency		Lane Departure	
HS-2005C	Pedestrians and bicyclists	Medians and pedestrian refuge areas	1	Intersections	\$4500	\$0	HSIP (23 U.S.C. 148)			29,000		State Highway Agency		Pedestrians	
HS-2007A	Roadside	Barrier- metal	1.9	Miles	\$504000	\$0	HSIP (23 U.S.C. 148)			23,000		State Highway Agency		Lane Departure	
HS-2007B	Roadside	Barrier- metal	1	Miles	\$252000	\$0	HSIP (23 U.S.C. 148)			14,500		State Highway Agency		Lane Departure	
HS-2007C	Roadway delineation	Longitudinal pavement markings - remarking	416.3	Miles	\$3114000	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
HS-2008A	Roadside	Barrier- metal	4.34	Miles	\$166050	\$0	HSIP (23 U.S.C. 148)			20,000		State Highway Agency		Lane Departure	
HS-2008B	Roadside	Barrier end treatments (crash cushions, terminals)	74	Locations	\$259200	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Data	
HS-2009A	Roadway delineation	Longitudinal pavement markings - remarking	478.8	Miles	\$1714500	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
HS-2010A	Access management	Change in access - close or restrict existing access	1	Intersections	\$180000	\$0	HSIP (23 U.S.C. 148)			26,000		State Highway Agency		Intersections	
HS-2010B	Roadside	Barrier end treatments (crash cushions, terminals)	1	Locations	\$130500	\$0	HSIP (23 U.S.C. 148)			107,000		State Highway Agency		Lane Departure	
HS-2010C	Roadway	Rumble strips – edge or shoulder	2	Locations	\$25200	\$0	HSIP (23 U.S.C. 148)			22,500		State Highway Agency		Lane Departure	
HS-2010D	Access management	Median crossover - directional crossover	1	Intersections	\$65700	\$0	HSIP (23 U.S.C. 148)			23,000		State Highway Agency		Intersections	

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HS-2011A	Roadway delineation	Longitudinal pavement markings - remarking	193	Miles	\$1578962	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
HS-2011A	Roadway delineation	Longitudinal pavement markings - remarking	193	Miles	\$3519934	\$0	HRRR Special Rule (23 U.S.C. 148(g)(1))			0		State Highway Agency		Lane Departure	
HS-2011B	Pedestrians and bicyclists	Pedestrian signal	3	Intersections	\$131400	\$0	HSIP (23 U.S.C. 148)			44,000		State Highway Agency		Intersections	
HS-2011C	Roadside	Barrier- metal	0.05	Miles	\$900	\$0	HSIP (23 U.S.C. 148)			220		State Highway Agency		Lane Departure	
HS-2011D	Roadway delineation	Improve retroreflectivity	28	Locations	\$630900	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
HS-2012A	Roadside	Barrier- metal	4	Locations	\$103500	\$0	HSIP (23 U.S.C. 148)			2,700		State Highway Agency		Lane Departure	
HS-2012B	Roadside	Barrier end treatments (crash cushions, terminals)	4	Locations	\$348300	\$0	HSIP (23 U.S.C. 148)			7,500		State Highway Agency		Lane Departure	
HS-2013A	Roadside	Barrier- metal	4	Locations	\$86400	\$0	HSIP (23 U.S.C. 148)			42,000		State Highway Agency		Lane Departure	
HS-2013B	Roadside	Barrier end treatments (crash cushions, terminals)	57	Locations	\$266400	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
HS-2013C	Roadside	Barrier end treatments (crash cushions, terminals)	38	Locations	\$180000	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
HS-2013D	Roadside	Barrier end treatments (crash cushions, terminals)	54	Locations	\$250200	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
HS-2013E	Roadside	Barrier end treatments (crash cushions, terminals)	72	Locations	\$351000	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
HS-2013F	Roadside	Barrier end treatments (crash cushions, terminals)	66	Locations	\$320400	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	

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PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST(\$)	TOTAL PROJECT COST(\$)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
HS-2014A	Roadway	Rumble strips – center	5.8	Miles	\$1134000	\$0	HSIP (23 U.S.C. 148)			8,575		State Highway Agency		Lane Departure	
HS-2014B	Roadside	Barrier- metal	0.6	Miles	\$4500	\$0	HSIP (23 U.S.C. 148)			1,000		State Highway Agency		Lane Departure	
HS-2014C	Roadway delineation	Raised pavement markers	1	Locations	\$50500	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Older Drivers	
HS-2014D	Pedestrians and bicyclists	Pedestrian beacons	3	Locations	\$2700	\$0	HSIP (23 U.S.C. 148)			4,000		State Highway Agency		Pedestrians	
SS-PE	Miscellaneous	Miscellaneous - other	15	Locations	\$147949	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Intersections	
W-5208M/MA	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	\$78765	\$0	HSIP (23 U.S.C. 148)			5,500		State Highway Agency		Intersections	
W-5214H	Access management	Median crossover - directional crossover	1	Locations	\$242617	\$0	HSIP (23 U.S.C. 148)			19,500		State Highway Agency		Intersections	
W-5300	Intersection traffic control	Modify traffic signal timing – general retiming	11	Locations	\$117540	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Intersections	
W-5313	Shoulder treatments	Widen shoulder – paved or other (includes add shoulder)	7.4	Miles	\$4339263	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
W-5316	Intersection geometry	Add/modify auxiliary lanes	0.2	Miles	\$592769	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Intersections	
W-5500	Roadway	Roadway widening - curve	1	Curves	\$455739	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
W-5503	Roadway delineation	Longitudinal pavement markings - remarking	1	Locations	\$1147659	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
W-5506	Intersection geometry	Add/modify auxiliary lanes	1.72	Miles	\$367137	\$0	HSIP (23 U.S.C. 148)			13,000		State Highway Agency		Lane Departure	
W-5508	Miscellaneous	Miscellaneous - other	111	Locations	\$1953351	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Intersections	

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W-5514	Access management	Raised island - install new	1	Locations	\$907	\$0	HSIP (23 U.S.C. 148)			43,000		State Highway Agency		Intersections	
W-5516	Roadway	Roadway - other	2.95	Miles	\$11277	\$0	Penalty Funds (23 U.S.C. 164)			0		State Highway Agency		Intersections	
W-5520	Access management	Median crossover - directional crossover	2.1	Miles	\$561786	\$0	HSIP (23 U.S.C. 148)			60,000		State Highway Agency		Intersections	
W-5522	Pedestrians and bicyclists	Pedestrians and bicyclists - other	1	Locations	\$572457	\$0	HSIP (23 U.S.C. 148)			9,300		State Highway Agency		Pedestrians	
W-5600	Interchange design	Convert at-grade intersection to interchange	3	Intersections	\$1905480	\$0	HSIP (23 U.S.C. 148)			26,000		State Highway Agency		Intersections	
W-5601AP	Shoulder treatments	Pave existing shoulders	1	Locations	\$83268	\$0	HSIP (23 U.S.C. 148)			1,000		State Highway Agency		Lane Departure	
W-5601BA	Roadway	Roadway narrowing (road diet, roadway reconfiguration)	0.38	Miles	\$207756	\$0	HSIP (23 U.S.C. 148)			14,000		State Highway Agency		Lane Departure	
W-5601BB	Pedestrians and bicyclists	Install new crosswalk	1	Crosswalks	\$63941	\$0	HSIP (23 U.S.C. 148)			45,000		State Highway Agency		Pedestrians	
W-5601BD	Access management	Median crossover - directional crossover	1	Intersections	\$207018	\$0	HSIP (23 U.S.C. 148)			22,000		State Highway Agency		Intersections	
W-5601BK	Intersection geometry	Intersection geometry - other	1	Intersections	\$33410	\$0	HSIP (23 U.S.C. 148)			3,900		State Highway Agency		Intersections	
W-5601BV	Intersection traffic control	Modify control - Modern Roundabout	1	Intersections	\$1080845	\$0	HSIP (23 U.S.C. 148)			4,100		State Highway Agency		Intersections	
W-5601BZ	Roadway	Superelevation / cross slope	1	Curves	\$354643	\$0	HSIP (23 U.S.C. 148)			860		State Highway Agency		Lane Departure	
W-5601C	Access management	Median crossover - directional crossover	1	Intersections	\$22923	\$0	HSIP (23 U.S.C. 148)			8,500		State Highway Agency		Intersections	
W-5601CC	Roadway	Superelevation / cross slope	1	Locations	\$90000	\$0	HSIP (23 U.S.C. 148)			930		State Highway Agency		Lane Departure	

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W-5601CD	Pedestrians and bicyclists	Medians and pedestrian refuge areas	1	Locations	\$721225	\$0	HSIP (23 U.S.C. 148)			21,000		State Highway Agency		Pedestrians	
W-5601CE	Access management	Median crossover - directional crossover	1	Locations	\$39052	\$0	HSIP (23 U.S.C. 148)			23,000		State Highway Agency		Intersections	
W-5601DP	Shoulder treatments	Pave existing shoulders	11	Miles	\$65133	\$0	HSIP (23 U.S.C. 148)			3,600		State Highway Agency		Lane Departure	
W-5601DQ	Access management	Median crossover - directional crossover	1	Locations	\$1820100	\$0	HSIP (23 U.S.C. 148)			14,000		State Highway Agency		Intersections	
W-5601EV	Access management	Median crossover - directional crossover	1	Locations	\$293971	\$0	HSIP (23 U.S.C. 148)			13,000		State Highway Agency		Intersections	
W-5601FB	Intersection traffic control	Intersection traffic control - other	1	Intersections	\$16317	\$0	HSIP (23 U.S.C. 148)			30,000		State Highway Agency		Intersections	
W-5601FG	Intersection traffic control	Intersection traffic control - other	1	Intersections	\$7284	\$0	HSIP (23 U.S.C. 148)			10,800		State Highway Agency		Intersections	
W-5601FH	Roadway	Roadway widening - add lane(s) along segment	0.28	Miles	\$90060	\$0	HSIP (23 U.S.C. 148)			10,000		State Highway Agency		Intersections	
W-5601FI	Intersection geometry	Add/modify auxiliary lanes	1	Lanes	\$972	\$0	HSIP (23 U.S.C. 148)			10,000		State Highway Agency		Intersections	
W-5601FK	Intersection geometry	Add/modify auxiliary lanes	2	Intersections	\$1130904	\$0	HSIP (23 U.S.C. 148)			12,000		State Highway Agency		Intersections	
W-5601G	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	\$1516	\$0	HSIP (23 U.S.C. 148)			22,000		State Highway Agency		Intersections	
W-5601GA	Access management	Median crossover - directional crossover	1	Intersections	\$18900	\$0	HSIP (23 U.S.C. 148)			19,000		State Highway Agency		Intersections	
W-5601GB	Intersection traffic control	Intersection traffic control - other	1	Intersections	\$90257	\$0	HSIP (23 U.S.C. 148)			6,000		State Highway Agency		Intersections	
W-5601HP	Intersection geometry	Intersection realignment	2	Intersections	\$455400	\$0	HSIP (23 U.S.C. 148)			6,500		State Highway Agency		Intersections	

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W-5601IJ	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	\$355675	\$0	HSIP (23 U.S.C. 148)			10,000		State Highway Agency		Lane Departure	
W-5602	Roadway	Roadway widening - add lane(s) along segment	1	Locations	\$6	\$0	HSIP (23 U.S.C. 148)			11,100		State Highway Agency		Lane Departure	
W-5700	Intersection traffic control	Modify traffic signal timing – general retiming	11	Intersections	\$360000	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Intersections	
W-5701A	Roadside	Barrier end treatments (crash cushions, terminals)	90	Locations	\$109643	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
W-5702C	Intersection geometry	Add/modify auxiliary lanes	2	Curves	\$892981	\$0	HSIP (23 U.S.C. 148)			1,400		State Highway Agency		Lane Departure	
W-5702E	Intersection traffic control	Intersection flashers –sign-mounted or overhead	3	Intersections	\$15708	\$0	HSIP (23 U.S.C. 148)			28,000		State Highway Agency		Intersections	
W-5702L	Roadway	Superelevation / cross slope	1	Locations	\$3496	\$0	HSIP (23 U.S.C. 148)			3,400		State Highway Agency		Lane Departure	
W-5702T	Roadside	Barrier end treatments (crash cushions, terminals)	2	Locations	\$118800	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
W-5702U	Intersection traffic control	Modify traffic signal – modernization/replacement	2	Intersections	\$67500	\$0	HSIP (23 U.S.C. 148)			36,000		State Highway Agency		Intersections	
W-5702V	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	\$47700	\$0	HSIP (23 U.S.C. 148)			1,400		State Highway Agency		Intersections	
W-5702W	Pedestrians and bicyclists	Pedestrian beacons	1	Intersections	\$2	\$0	HSIP (23 U.S.C. 148)			9,500		State Highway Agency		Pedestrians	
W-5703A	Intersection traffic control	Intersection traffic control - other	1	Intersections	\$2595	\$0	HSIP (23 U.S.C. 148)			38,000		State Highway Agency		Intersections	
W-5703D	Access management	Median crossover - directional crossover	2	Intersections	\$212400	\$0	HSIP (23 U.S.C. 148)			35,000		State Highway Agency		Intersections	
W-5703H	Intersection geometry	Intersection geometry - other	1	Intersections	\$108000	\$0	HSIP (23 U.S.C. 148)			19,000		State Highway Agency		Intersections	



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W-5703I	Intersection traffic control	Intersection flashers –sign-mounted or overhead	1	Intersections	\$1085	\$0	HSIP (23 U.S.C. 148)			7,900		State Highway Agency		Intersections	
W-5703J	Pedestrians and bicyclists	Modify existing crosswalk	1	Crosswalks	\$48600	\$0	HSIP (23 U.S.C. 148)			22,000		State Highway Agency		Pedestrians	
W-5703Q	Intersection geometry	Intersection geometry - other	2	Intersections	\$71100	\$0	HSIP (23 U.S.C. 148)			4,350		State Highway Agency		Intersections	
W-5703R	Intersection geometry	Add/modify auxiliary lanes	2	Lanes	\$18000	\$0	HSIP (23 U.S.C. 148)			36,000		State Highway Agency		Intersections	
W-5704A	Access management	Median crossover - relocate/close crossover	1	Locations	\$107829	\$0	HSIP (23 U.S.C. 148)			36,000		State Highway Agency		Intersections	
W-5705AG	Intersection traffic control	Modify traffic signal –other	1	Intersections	\$18555	\$0	HSIP (23 U.S.C. 148)			15,000		State Highway Agency		Intersections	
W-5705AK	Intersection geometry	Add/modify auxiliary lanes	2	Lanes	\$49500	\$0	HSIP (23 U.S.C. 148)			9,200		State Highway Agency		Intersections	
W-5705AL	Intersection traffic control	Intersection traffic control - other	1	Intersections	\$46075	\$0	HSIP (23 U.S.C. 148)			14,000		State Highway Agency		Intersections	
W-5705F	Roadway	Pavement surface – high friction surface	0.2	Miles	\$966	\$0	HSIP (23 U.S.C. 148)			15,000		State Highway Agency		Lane Departure	
W-5705J	Pedestrians and bicyclists	Pedestrian signal	2	Intersections	\$81224	\$0	HSIP (23 U.S.C. 148)			35,000		State Highway Agency		Pedestrians	
W-5705Q	Intersection traffic control	Intersection traffic control - other	1	Intersections	\$242358	\$0	HSIP (23 U.S.C. 148)			34,000		State Highway Agency		Intersections	
W-5705S	Interchange design	Acceleration / deceleration / merge lane	0.2	Miles	\$414000	\$0	HSIP (23 U.S.C. 148)			64,000		State Highway Agency		Lane Departure	
W-5706B	Intersection geometry	Add/modify auxiliary lanes	1	Lanes	\$520140	\$0	HSIP (23 U.S.C. 148)			8,700		State Highway Agency		Intersections	
W-5706H	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	\$1588500	\$0	HSIP (23 U.S.C. 148)			3,600		State Highway Agency		Intersections	

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W-5706K	Pedestrians and bicyclists	Install sidewalk	0.2	Miles	\$60451	\$0	HSIP (23 U.S.C. 148)			24,000		State Highway Agency		Pedestrians	
W-5706Q	Roadway	Rumble strips – edge or shoulder	1	Locations	\$1008	\$0	HSIP (23 U.S.C. 148)			6,700		State Highway Agency		Lane Departure	
W-5706Z	Roadway	Superelevation / cross slope	1	Locations	\$9283	\$0	HSIP (23 U.S.C. 148)			2,000		State Highway Agency		Lane Departure	
W-5708B	Access management	Median crossover - directional crossover	1	Locations	\$129437	\$0	HSIP (23 U.S.C. 148)			14,000		State Highway Agency		Intersections	
W-5708G	Access management	Median crossover - directional crossover	2	Intersections	\$14040	\$0	HSIP (23 U.S.C. 148)			21,000		State Highway Agency		Intersections	
W-5708J	Intersection traffic control	Intersection traffic control - other	1	Intersections	\$63000	\$0	HSIP (23 U.S.C. 148)			4,760		State Highway Agency		Intersections	
W-5708K	Intersection traffic control	Modify traffic signal – add flashing yellow arrow	2	Intersections	\$13500	\$0	HSIP (23 U.S.C. 148)			36,600		State Highway Agency		Intersections	
W-5709A	Interchange design	Interchange design - other	4	Signs	\$28047	\$0	HSIP (23 U.S.C. 148)			51,000		State Highway Agency		Intersections	
W-5709H	Access management	Median crossover - directional crossover	1	Locations	\$459000	\$0	HSIP (23 U.S.C. 148)			34,000		State Highway Agency		Intersections	
W-5710AA	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	\$67500	\$0	HSIP (23 U.S.C. 148)			16,000		State Highway Agency		Intersections	
W-5710AB	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	\$832500	\$0	HSIP (23 U.S.C. 148)			1,800		State Highway Agency		Intersections	
W-5710AC	Intersection geometry	Add/modify auxiliary lanes	1	Lanes	\$382500	\$0	HSIP (23 U.S.C. 148)			8,800		State Highway Agency		Intersections	
W-5710AF	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	\$61669	\$0	HSIP (23 U.S.C. 148)			3,300		State Highway Agency		Intersections	
W-5710AG	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	\$945000	\$0	HSIP (23 U.S.C. 148)			1,800		State Highway Agency		Intersections	

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PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST(\$)	TOTAL PROJECT COST(\$)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
W-5710AJ	Access management	Median crossover - directional crossover	1	Intersections	\$751500	\$0	HSIP (23 U.S.C. 148)			17,000		State Highway Agency		Intersections	
W-5710AK	Access management	Median crossover - directional crossover	1	Locations	\$99000	\$0	HSIP (23 U.S.C. 148)			20,000		State Highway Agency		Intersections	
W-5710AL	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	\$27000	\$0	HSIP (23 U.S.C. 148)			3,400		State Highway Agency		Intersections	
W-5710AM	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	\$27000	\$0	HSIP (23 U.S.C. 148)			2,200		State Highway Agency		Intersections	
W-5710AN	Intersection geometry	Add/modify auxiliary lanes	1	Lanes	\$135000	\$0	HSIP (23 U.S.C. 148)			16,000		State Highway Agency		Intersections	
W-5710AP	Roadway delineation	Longitudinal pavement markings – new	10	Locations	\$487044	\$0	HRRR Special Rule (23 U.S.C. 148(g)(1))			0		State Highway Agency		Lane Departure	
W-5710AQ	Roadway delineation	Longitudinal pavement markings – new	5	Locations	\$720000	\$0	HRRR Special Rule (23 U.S.C. 148(g)(1))			0		State Highway Agency		Lane Departure	
W-5710C	Access management	Raised island - install new	1	Locations	\$977500	\$0	HSIP (23 U.S.C. 148)			8,900		State Highway Agency		Intersections	
W-5710I	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	\$67500	\$0	HSIP (23 U.S.C. 148)			4,900		State Highway Agency		Intersections	
W-5710K	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	\$46953	\$0	HSIP (23 U.S.C. 148)			3,900		State Highway Agency		Intersections	
W-5710R	Access management	Raised island - install new	1	Locations	\$540000	\$0	HSIP (23 U.S.C. 148)			35,000		State Highway Agency		Pedestrians	
W-5710S	Intersection geometry	Add/modify auxiliary lanes	1	Lanes	\$162000	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Intersections	
W-5710Y	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	\$765000	\$0	HSIP (23 U.S.C. 148)			6,500		State Highway Agency		Intersections	

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PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST(\$)	TOTAL PROJECT COST(\$)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
W-5713C	Roadside	Barrier end treatments (crash cushions, terminals)	64	Locations	\$143177	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
W-5713E	Roadside	Barrier end treatments (crash cushions, terminals)	137	Locations	\$205385	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
W-5713O	Roadway delineation	Longitudinal pavement markings - remarking	40	Miles	\$232186	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
W-5713P	Roadside	Barrier- metal	0.7	Miles	\$125	\$0	HSIP (23 U.S.C. 148)			10,700		State Highway Agency		Lane Departure	
W-5713Q	Roadside	Barrier- metal	0.4	Miles	\$125	\$0	HSIP (23 U.S.C. 148)			2,800		State Highway Agency		Lane Departure	
W-5713T	Roadway delineation	Longitudinal pavement markings - remarking	55.8	Miles	\$1087200	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
W-5713U	Roadway delineation	Longitudinal pavement markings - remarking	65.1	Miles	\$1202400	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
W-5714H	Roadside	Barrier- metal	0.5	Miles	\$828	\$0	HSIP (23 U.S.C. 148)			410		State Highway Agency		Lane Departure	
W-5714J	Intersection traffic control	Intersection flashers –sign-mounted or overhead	1	Signs	\$31500	\$0	HSIP (23 U.S.C. 148)			9,100		State Highway Agency		Intersections	
W-5714K	Roadway	Rumble strips – center	10.4	Miles	\$189000	\$0	HSIP (23 U.S.C. 148)			3,300		State Highway Agency		Lane Departure	
W-5717	Miscellaneous	Miscellaneous - other	111	Locations	\$450000	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Intersections	
W-5802A	Pedestrians and bicyclists	Pedestrian signal	1	Intersections	\$38700	\$0	HSIP (23 U.S.C. 148)			17,000		State Highway Agency		Pedestrians	
W-5802B	Pedestrians and bicyclists	Pedestrian warning signs	1	Crosswalks	\$29700	\$0	HSIP (23 U.S.C. 148)			8,600		State Highway Agency		Pedestrians	
W-5802C	Pedestrians and bicyclists	Pedestrian warning signs	1	Crosswalks	\$29700	\$0	HSIP (23 U.S.C. 148)			8,600		State Highway Agency		Pedestrians	

2021 North Carolina Highway Safety Improvement Program

PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST(\$)	TOTAL PROJECT COST(\$)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
W-5802E	Roadway delineation	Longitudinal pavement markings - remarking	28.8	Miles	\$760500	\$0	HSIP (23 U.S.C. 148)			30,000		State Highway Agency		Lane Departure	
W-5803A	Pedestrians and bicyclists	Pedestrian signal - other	2	Intersections	\$7200	\$0	HSIP (23 U.S.C. 148)			42,000		State Highway Agency		Pedestrians	
W-5803B	Roadway	Rumble strips – edge or shoulder	26.35	Miles	\$9000	\$0	HSIP (23 U.S.C. 148)			30,000		State Highway Agency		Lane Departure	
W-5803C	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	1	Intersections	\$18900	\$0	HSIP (23 U.S.C. 148)			31,000		State Highway Agency		Intersections	
W-5803D	Pedestrians and bicyclists	Pedestrian signal - other	1	Intersections	\$3600	\$0	HSIP (23 U.S.C. 148)			32,000		State Highway Agency		Pedestrians	
W-5803E	Intersection traffic control	Modify traffic signal timing – adjust clearance interval (yellow change and/or all-red)	1	Intersections	\$13500	\$0	HSIP (23 U.S.C. 148)			26,000		State Highway Agency		Intersections	
W-5804A	Access management	Median crossover - directional crossover	1	Intersections	\$90000	\$0	HSIP (23 U.S.C. 148)			9,700		State Highway Agency		Intersections	
W-5804B	Alignment	Horizontal realignment curve	1	Intersections	\$112500	\$0	HSIP (23 U.S.C. 148)			2,500		State Highway Agency		Lane Departure	
W-5805A	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	\$225000	\$0	HSIP (23 U.S.C. 148)			4,800		State Highway Agency		Intersections	
W-5805B	Intersection traffic control	Modify traffic signal – add flashing yellow arrow	4	Intersections	\$10800	\$0	HSIP (23 U.S.C. 148)			9,700		State Highway Agency		Intersections	
W-5805C	Pedestrians and bicyclists	Medians and pedestrian refuge areas	1	Intersections	\$124034	\$0	HSIP (23 U.S.C. 148)			16,000		State Highway Agency		Pedestrians	
W-5805D	Roadside	Barrier- metal	0.15	Miles	\$69996	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
W-5805E	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	\$166500	\$0	HSIP (23 U.S.C. 148)			7,800		State Highway Agency		Intersections	

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PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST(\$)	TOTAL PROJECT COST(\$)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
W-5805F	Roadway delineation	Longitudinal pavement markings - remarking	1	Locations	\$900	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
W-5805G	Access management	Median crossover - directional crossover	1	Intersections	\$126000	\$0	HSIP (23 U.S.C. 148)			8,400		State Highway Agency		Intersections	
W-5805H	Intersection traffic control	Modify traffic signal – add flashing yellow arrow	3	Intersections	\$74250	\$0	HSIP (23 U.S.C. 148)			13,000		State Highway Agency		Intersections	
W-5806A	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	\$315000	\$0	HSIP (23 U.S.C. 148)			1,800		State Highway Agency		Intersections	
W-5806B	Roadway	Rumble strips – edge or shoulder	4	Curves	\$4500	\$0	HSIP (23 U.S.C. 148)			9,800		State Highway Agency		Lane Departure	
W-5806C	Intersection traffic control	Modify control – Modern Roundabout	2	Intersections	\$54000	\$0	HSIP (23 U.S.C. 148)			12,000		State Highway Agency		Intersections	
W-5806D	Intersection traffic control	Intersection traffic control - other	3	Intersections	\$166500	\$0	HSIP (23 U.S.C. 148)			6,600		State Highway Agency		Intersections	
W-5806E	Pedestrians and bicyclists	Pedestrian signal	1	Intersections	\$4500	\$0	HSIP (23 U.S.C. 148)			14,000		State Highway Agency		Pedestrians	
W-5807A	Intersection traffic control	Intersection traffic control - other	1	Intersections	\$67500	\$0	HSIP (23 U.S.C. 148)			23,000		State Highway Agency		Intersections	
W-5807B	Pedestrians and bicyclists	Pedestrian signal - other	2	Intersections	\$71100	\$0	HSIP (23 U.S.C. 148)			8,500		State Highway Agency		Pedestrians	
W-5808A	Roadway signs and traffic control	Roadway signs and traffic control - other	0.4	Miles	\$22500	\$0	HSIP (23 U.S.C. 148)			18,000		State Highway Agency		Lane Departure	
W-5808B	Access management	Median crossover - directional crossover	1	Intersections	\$76500	\$0	HSIP (23 U.S.C. 148)			13,000		State Highway Agency		Intersections	
W-5808C	Intersection traffic control	Modify control – two-way stop to all-way stop	1	Intersections	\$15300	\$0	HSIP (23 U.S.C. 148)			3,600		State Highway Agency		Intersections	
W-5809A	Roadway	Rumble strips –other	15	Miles	\$22500	\$0	HSIP (23 U.S.C. 148)			11,000		State Highway Agency		Lane Departure	

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PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST(\$)	TOTAL PROJECT COST(\$)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
W-5813A	Pedestrians and bicyclists	Pedestrian signal	1	Crosswalks	\$72000	\$0	HSIP (23 U.S.C. 148)			19,000		State Highway Agency		Pedestrians	
W-5813B	Roadway delineation	Longitudinal pavement markings - remarking	81.9	Miles	\$9000	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Lane Departure	
W-5813C	Pedestrians and bicyclists	Pedestrian signal	1	Crosswalks	\$9000	\$0	HSIP (23 U.S.C. 148)			6,100		State Highway Agency		Pedestrians	
W-5813D	Pedestrians and bicyclists	Pedestrians and bicyclists – other	2	Intersections	\$3600	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Pedestrians	
W-5813E	Pedestrians and bicyclists	Pedestrian signal	1	Crosswalks	\$9000	\$0	HSIP (23 U.S.C. 148)			25,000		State Highway Agency		Pedestrians	
W-5813F	Pedestrians and bicyclists	Pedestrian signal	1	Crosswalks	\$9000	\$0	HSIP (23 U.S.C. 148)			21,000		State Highway Agency		Pedestrians	
W-5813G	Pedestrians and bicyclists	Pedestrians and bicyclists – other	2	Intersections	\$7200	\$0	HSIP (23 U.S.C. 148)			0		State Highway Agency		Pedestrians	
W-5813H	Roadside	Barrier- metal	2.7	Miles	\$18000	\$0	HSIP (23 U.S.C. 148)			1,450		State Highway Agency		Lane Departure	
W-5813I	Roadside	Barrier- metal	1.4	Miles	\$13500	\$0	HSIP (23 U.S.C. 148)			2,100		State Highway Agency		Lane Departure	
W-5813J	Roadway	Rumble strips – center	18.8	Miles	\$18000	\$0	HSIP (23 U.S.C. 148)			6,500		State Highway Agency		Lane Departure	
W-5814A	Intersection geometry	Add/modify auxiliary lanes	1	Lanes	\$9000	\$0	HSIP (23 U.S.C. 148)			5,700		State Highway Agency		Intersections	
W-5814B	Roadside	Barrier end treatments (crash cushions, terminals)	27	Locations	\$185400	\$0	HSIP (23 U.S.C. 148)			16,000		State Highway Agency		Lane Departure	
W-5814C	Roadside	Barrier end treatments (crash cushions, terminals)	24	Locations	\$166500	\$0	HSIP (23 U.S.C. 148)			16,000		State Highway Agency		Lane Departure	

## Safety Performance

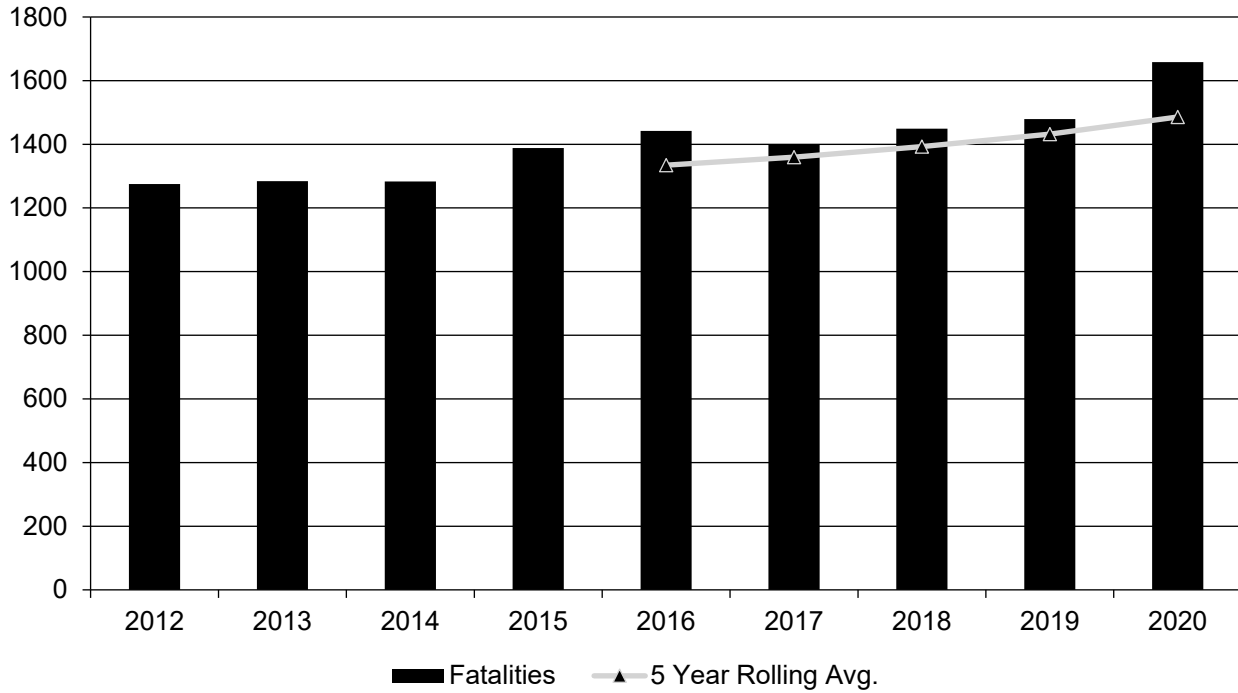
### *General Highway Safety Trends*

Present data showing the general highway safety trends in the State for the past five years.

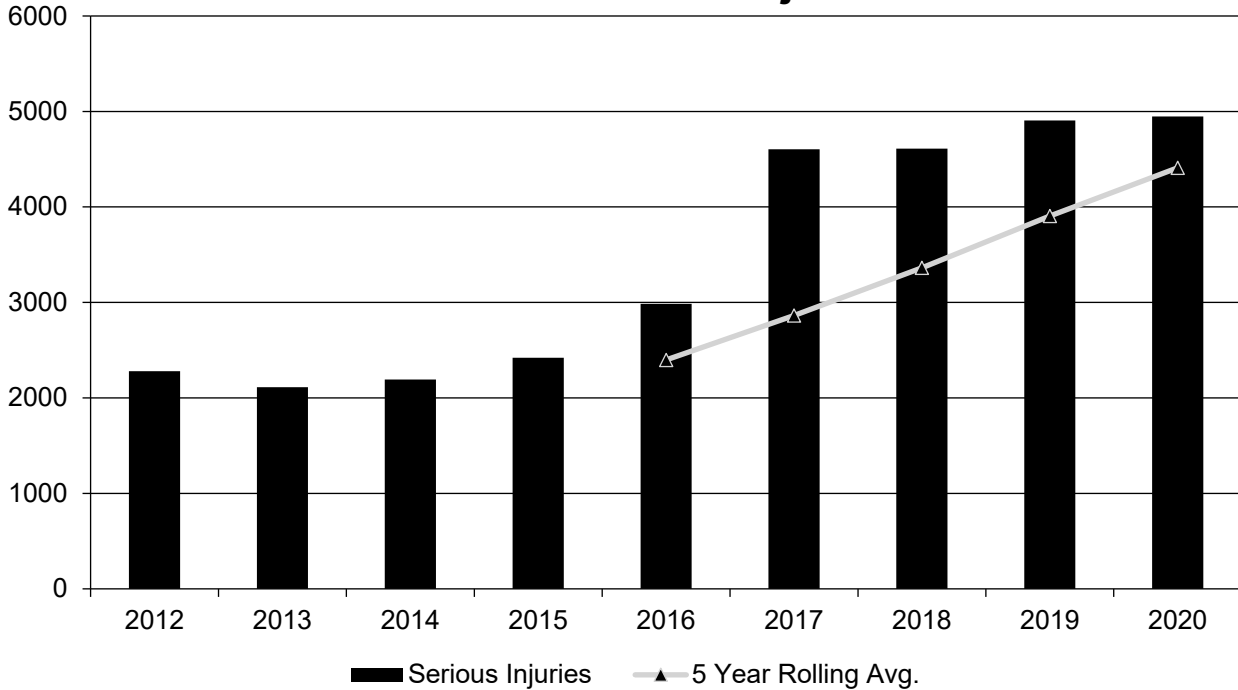
<b>PERFORMANCE MEASURES</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
Fatalities	1,275	1,284	1,283	1,388	1,442	1,401	1,449	1,479	1,658
Serious Injuries	2,279	2,112	2,192	2,421	2,985	4,604	4,610	4,905	4,947
Fatality rate (per HMVMT)	1.221	1.221	1.188	1.241	1.238	1.176	1.196	1.207	1.565
Serious injury rate (per HMVMT)	2.182	2.009	2.029	2.164	2.564	3.866	3.806	4.004	4.670
Number non-motorized fatalities	226	202	193	222	222	232	250	254	281
Number of non-serious motorized injuries	247	199	219	214	246	329	349	400	396



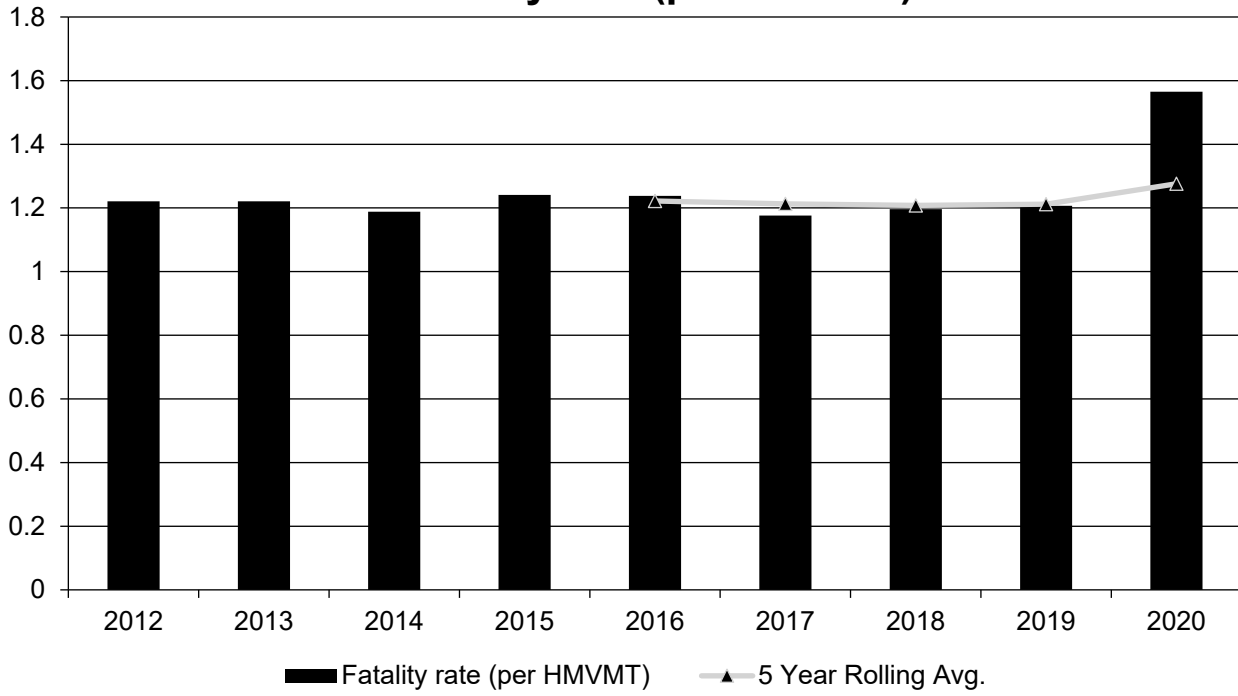
### Annual Fatalities



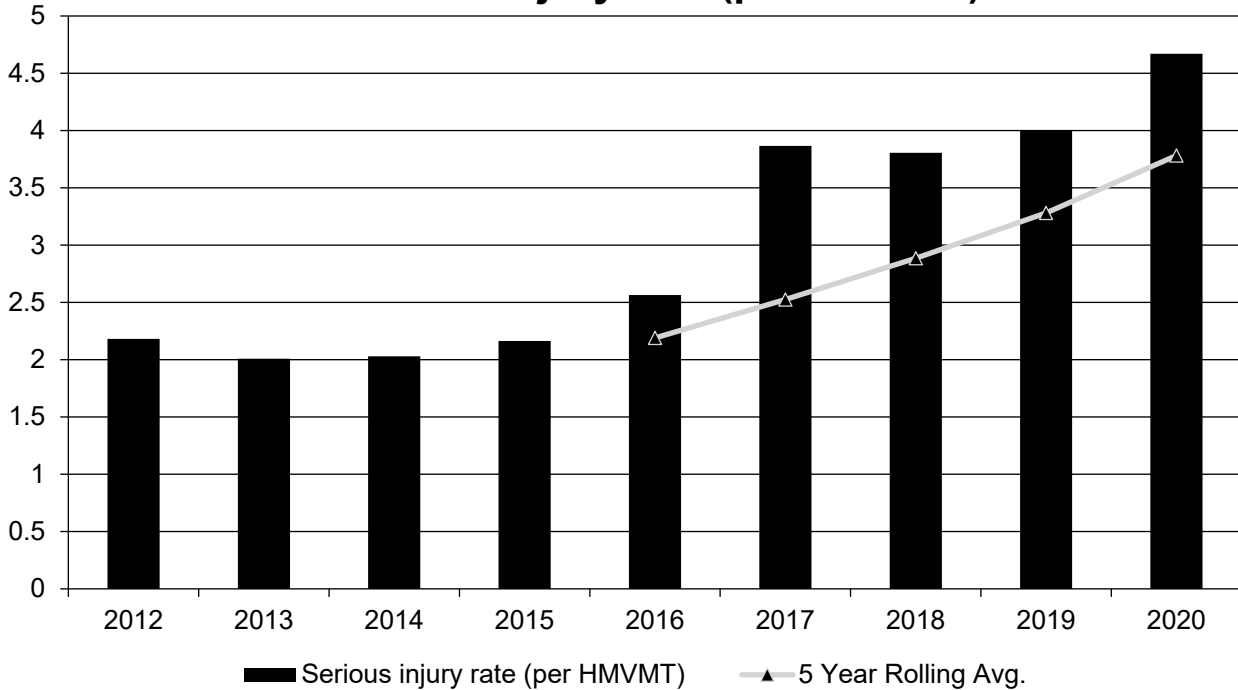
### Annual Serious Injuries



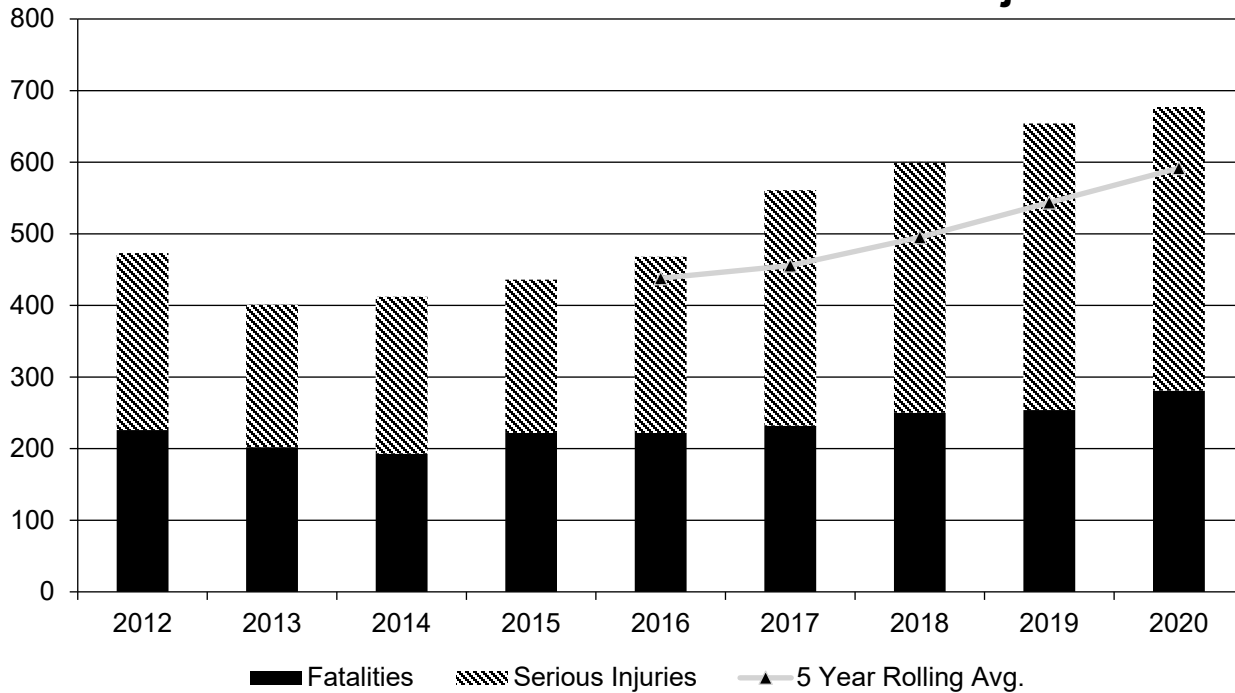
### Fatality rate (per HMVMT)



### Serious injury rate (per HMVMT)



### Non Motorized Fatalities and Serious Injuries



**Describe fatality data source.**

State Motor Vehicle Crash Database

**To the maximum extent possible, present this data by functional classification and ownership.**

**Year 2020**

Functional Classification	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
Rural Principal Arterial (RPA) - Interstate	39.6	186.4	0.63	2.96
Rural Principal Arterial (RPA) - Other Freeways and Expressways	20	78	0.75	2.93
Rural Principal Arterial (RPA) - Other	75	397.8	1.24	6.52
Rural Minor Arterial	124	609.6	2.07	10.15
Rural Minor Collector	188.2	812	2.65	11.42
Rural Major Collector	82.4	364	2.85	12.59

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<b>Functional Classification</b>	<b>Number of Fatalities (5-yr avg)</b>	<b>Number of Serious Injuries (5-yr avg)</b>	<b>Fatality Rate (per HMVMT) (5-yr avg)</b>	<b>Serious Injury Rate (per HMVMT) (5-yr avg)</b>
Rural Local Road or Street	165.4	738.6	1.91	8.53
Urban Principal Arterial (UPA) - Interstate	90.4	445.6	0.47	2.28
Urban Principal Arterial (UPA) - Other Freeways and Expressways	30.6	127	0.53	2.2
Urban Principal Arterial (UPA) - Other	184	902.8	1.2	5.91
Urban Minor Arterial	147.2	790.2	1.07	5.76
Urban Minor Collector	70.6	382.2	1	5.4
Urban Major Collector	8.4	39.4	1.36	6.3
Urban Local Road or Street	52	202.8	0.35	1.68

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**Year 2020**

<b>Roadways</b>	<b>Number of Fatalities (5-yr avg)</b>	<b>Number of Serious Injuries (5-yr avg)</b>	<b>Fatality Rate (per HMVMT) (5-yr avg)</b>	<b>Serious Injury Rate (per HMVMT) (5-yr avg)</b>
State Highway Agency	1,377.2	6,733.8	1.34	6.58
County Highway Agency				
Town or Township Highway Agency				
City or Municipal Highway Agency	53.6	255.6	0.43	1.99
State Park, Forest, or Reservation Agency				
Local Park, Forest or Reservation Agency				
Other State Agency				
Other Local Agency				
Private (Other than Railroad)				
Railroad				
State Toll Authority				
Local Toll Authority				
Other Public Instrumentality (e.g. Airport, School, University)				
Indian Tribe Nation				

**Provide additional discussion related to general highway safety trends.**

The N.C. Department of Transportation is committed to measuring and improving performance. The department's Organizational Performance Dashboard, which is featured on NCDOT's web page, serves as an indicator of how well we are meeting our mission and goals. One major NCDOT goal is "Making our transportation network safer". This is defined as the total number of statewide fatalities on NC roads per 100 million vehicle miles traveled for the calendar year to date. The fatality rate gauge shown on our Performance Dashboard is accompanied by a trend chart of the total number of fatalities, crashes and injuries by year. The Performance Dashboard can be found at <https://apps.dot.state.nc.us/dot/dashboard/>

Many staff members within NCDOT have a work performance metric for highway safety included in their year-end appraisal.

## ***Safety Performance Targets***

### **Safety Performance Targets**

#### **Calendar Year 2022 Targets \***

##### ***Number of Fatalities:1254.9***

##### ***Describe the basis for established target, including how it supports SHSP goals.***

For the 2022 Highway Safety Improvement Plan (HSIP), the goal is to reduce total fatalities by 12.17 percent from 1,428.8 (2016-2020 average) to 1,254.9 (2018-2022 average) by December 31, 2022.

##### ***Number of Serious Injuries:3537.6***

##### ***Describe the basis for established target, including how it supports SHSP goals.***

For the 2022 Highway Safety Improvement Plan (HSIP), the goal is to reduce total serious injuries by 19.79 percent from 4,410.2 (2016-2020 average) to 3,537.6 (2018-2022 average) by December 31, 2022.

##### ***Fatality Rate:1.057***

##### ***Describe the basis for established target, including how it supports SHSP goals.***

For the 2022 Highway Safety Improvement Plan (HSIP), the goal is to reduce the fatality rate by 13.78 percent from 1.226 (2016-2020 average) to 1.057 (2018-2022 average) by December 31, 2022.

##### ***Serious Injury Rate:2.962***

##### ***Describe the basis for established target, including how it supports SHSP goals.***

For the 2022 Highway Safety Improvement Plan (HSIP), the goal is to reduce the serious injury rate by 21.68 percent from 3.782 (2016-2020 average) to 2.962 (2018-2022 average) by December 31, 2022.

##### ***Total Number of Non-Motorized Fatalities and Serious Injuries:486.0***

##### ***Describe the basis for established target, including how it supports SHSP goals.***

For the 2022 Highway Safety Improvement Plan (HSIP), the goal is to reduce the total non-motorized fatalities and serious injuries by 17.93 percent from 592.2 (2016-2020 average) to 486.0 (2018-2022 average) by December 31, 2022.

#### **Describe efforts to coordinate with other stakeholders (e.g. MPOs, SHSO) to establish safety performance targets.**

Through collaboration with the Governor's Highway Safety Program (GHSP), Metropolitan Planning Organizations (MPOs) and the Executive Committee for Highway Safety (ECHS), we continue to work together to establish targets for the five safety performance measures. Initially, the safety performance targets were discussed, and a direction was set through our ECHS in September 2016. The ECHS includes partners from top level agency and department heads from various state and local agencies, including the GHSP. These safety champions are key policy and business funding decision makers in the highway safety arena. The direction set by the ECHS follows the goals set through our 2014 State Highway Safety Plan (SHSP) concerning the reduction of fatalities and serious injuries. The numbers and rates for the five safety performance measures/targets are annually gathered and adjusted in accordance with the 2014 SHSP goal of a 50% reduction of fatalities and serious injuries by the year 2030. NCDOT continually provides target setting crash data to each of the MPOs so they could establish their 2018, 2019 and upcoming 2020 safety

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performance targets. Our state has completed our 2019 SHSP update and the goal has been adjusted in hopes of providing a better opportunity for our state to make significant progress towards meeting our future safety performance targets.

### Does the State want to report additional optional targets?

No

**Describe progress toward meeting the State's 2020 Safety Performance Targets (based on data available at the time of reporting). For each target, include a discussion of any reasons for differences in the actual outcomes and targets.**

PERFORMANCE MEASURES	TARGETS	ACTUALS
Number of Fatalities	1227.8	1485.8
Number of Serious Injuries	2812.8	4410.2
Fatality Rate	1.084	1.276
Serious Injury Rate	2.462	3.782
Non-Motorized Fatalities and Serious Injuries	426.6	591.8

Based on our data as of 6/25/2020, our state was determined to have not met or made significant progress toward the CY 2020 targets. In order to align with the goals of the 2014 North Carolina Strategic Highway Safety Plan (SHSP), our state's Executive Committee for Highway Safety (ECHS) agreed to set our safety targets for each of the five safety performance measures so that they will support the reduction of our statewide fatalities and serious injuries by half before 2030. Because the safety targets are set based on the aspirational 2014 SHSP goal, it will be difficult to make significant progress towards meeting the fatalities, fatality rate, and non-motorized fatalities and serious injuries safety performance targets based on the currently increasing trends in our statewide fatalities and serious injuries. Additionally, due to the substantial increases in historical serious injury trends in September 2016 caused by the national definition change for "Suspected Serious Injury (A)", it will also be difficult to make significant progress towards meeting the serious injuries and serious injury rate safety performance targets.

### ***Applicability of Special Rules***

#### Does the HRRR special rule apply to the State for this reporting period?

No

**Provide the number of older driver and pedestrian fatalities and serious injuries 65 years of age and older for the past seven years.**

PERFORMANCE MEASURES	2014	2015	2016	2017	2018	2019	2020
Number of Older Driver and Pedestrian Fatalities	171	206	194	192	219	238	203

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<b>PERFORMANCE MEASURES</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
Number of Older Driver and Pedestrian Serious Injuries	154	176	223	338	371	396	324



## Evaluation

### *Program Effectiveness*

#### How does the State measure effectiveness of the HSIP?

- Benefit/Cost Ratio

#### Based on the measures of effectiveness selected previously, describe the results of the State's program level evaluations.

NCDOT has a robust project evaluation program. Every project that is funded through the federal HSIP dollars and the NC spot safety dollars are evaluated from a before and after perspective. These evaluations include project background, before and after summary data tables, and before and after collision diagrams. The main objective of these evaluations is to provide feedback to our field personnel as to whether the project was successful. The main thing measured is if the pattern of crashes the safety countermeasure was installed for actually reduced in the after period.

NCDOT also looks at all projects that are completed over a period of time and assesses how many crashes were reduced, with a crash cost attached to those crashes, versus the original project costs. Upon reviewing approximately 600 projects, the benefits of crashes reduced resulted in a 14:1 benefit cost. Our field personnel also have an annual expectation for developing safety projects and getting those projects on the ground.

#### What other indicators of success does the State use to demonstrate effectiveness and success of the Highway Safety Improvement Program?

- # RSAs completed
- Increased awareness of safety and data-driven process
- Increased focus on local road safety
- More systemic programs
- Policy change
- Other-Reduction in Target Crashes

### *Effectiveness of Groupings or Similar Types of Improvements*

#### Present and describe trends in SHSP emphasis area performance measures.

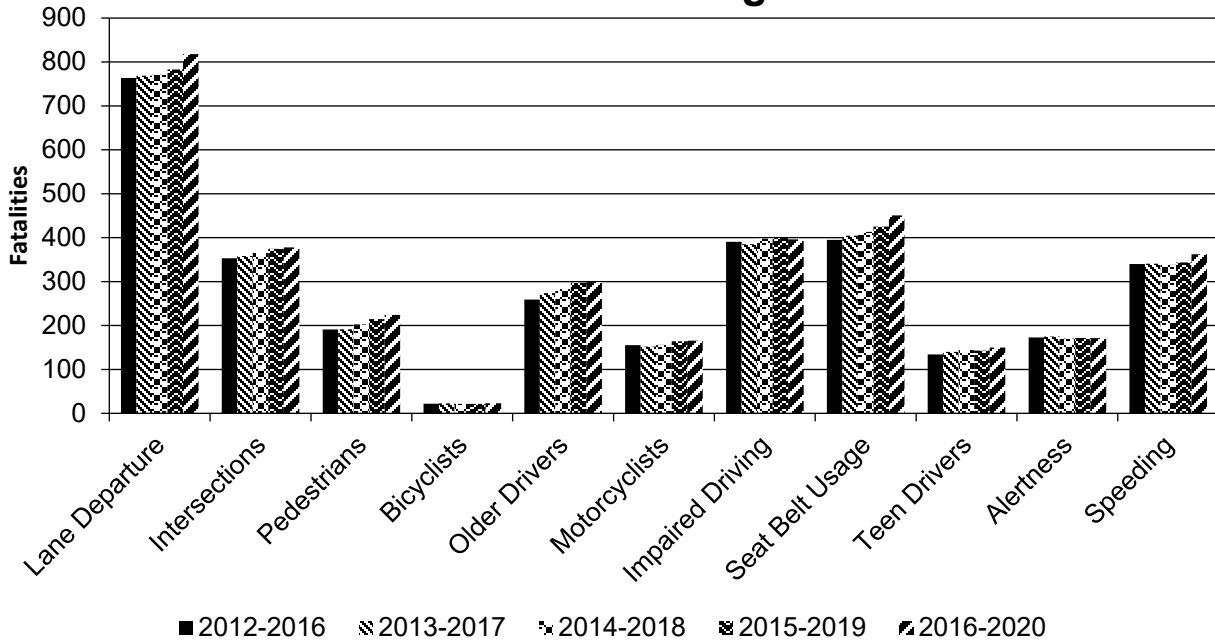
##### Year 2020

SHSP Emphasis Area	Targeted Crash Type	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
Lane Departure		818	2,376.4	0.77	2.24
Intersections		377.8	1,300.6	0.36	1.23
Pedestrians		224.2	282.4	0.21	0.27
Bicyclists		23	62	0.02	0.06

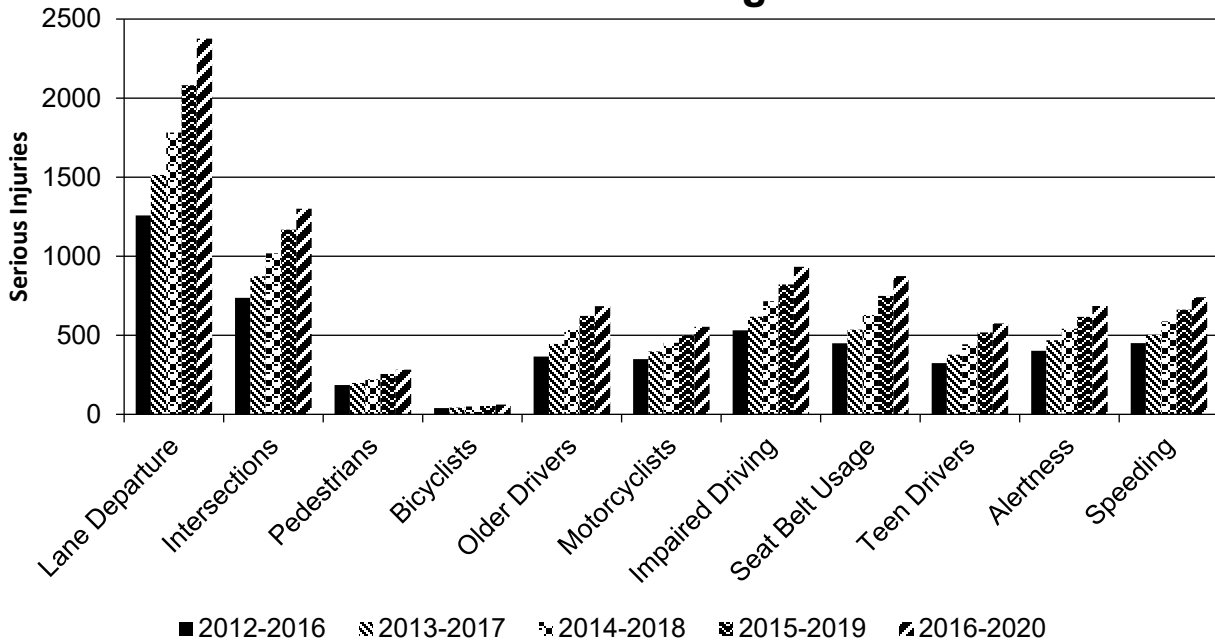
2021 North Carolina Highway Safety Improvement Program

<b>SHSP Emphasis Area</b>	<b>Targeted Crash Type</b>	<b>Number of Fatalities (5-yr avg)</b>	<b>Number of Serious Injuries (5-yr avg)</b>	<b>Fatality Rate (per HMVMT) (5-yr avg)</b>	<b>Serious Injury Rate (per HMVMT) (5-yr avg)</b>
Older Drivers		298.6	684	0.28	0.64
Motorcyclists		165.6	553.8	0.16	0.52
Impaired Driving		396.2	933.6	0.37	0.88
Seat Belt Usage		450.6	874.4	0.42	0.83
Teen Drivers		149.8	574.6	0.14	0.54
Alertness		171.4	684.8	0.16	0.65
Speeding		362	741	0.34	0.7

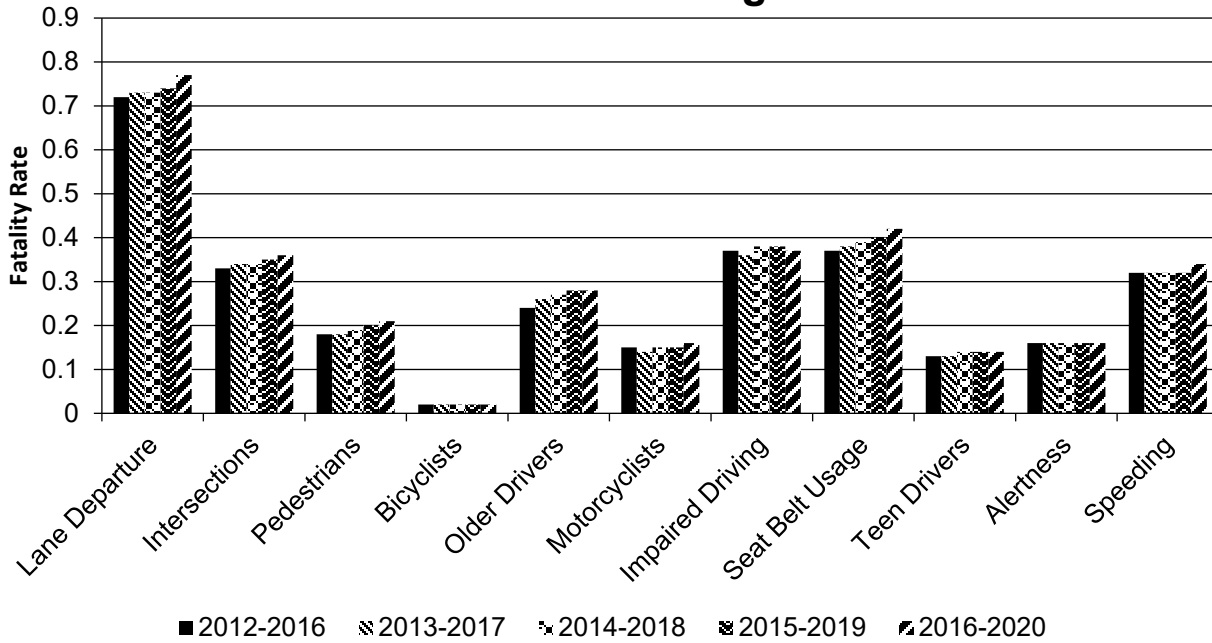
### Number of Fatalities 5 Year Average



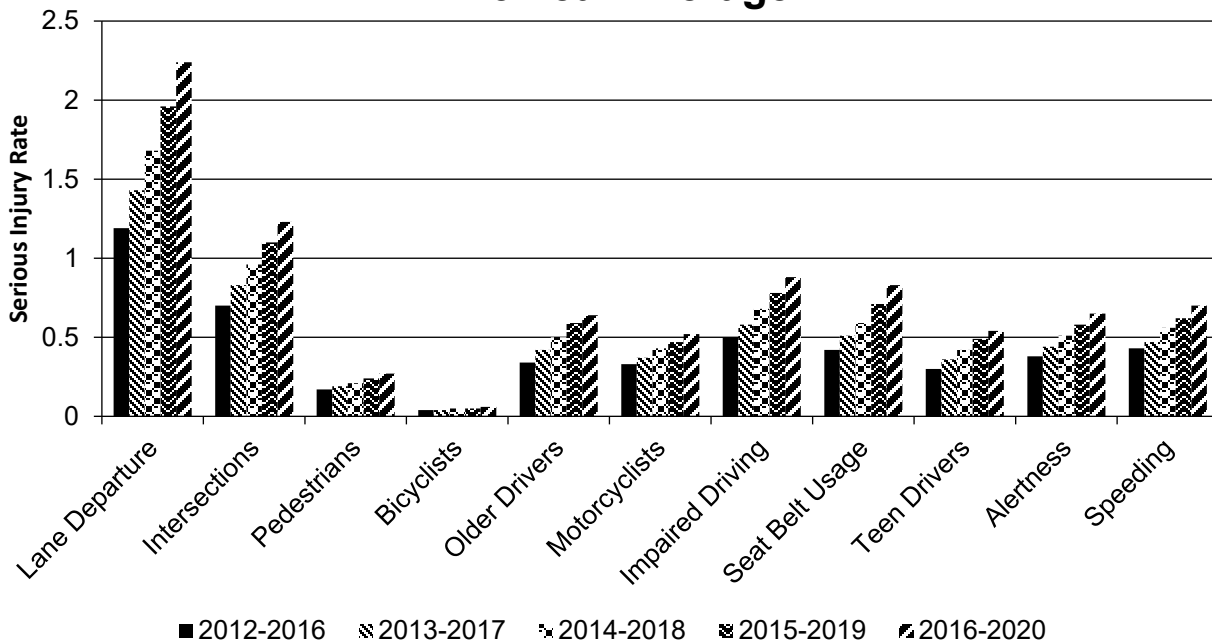
### Number of Serious Injuries 5 Year Average



### Fatality Rate (per HMVMT) 5 Year Average



### Serious Injury Rate (per HMVMT) 5 Year Average



**Has the State completed any countermeasure effectiveness evaluations during the reporting period?**

Yes

**Please provide the following summary information for each countermeasure effectiveness evaluation.**

**CounterMeasures:** Chevron and Curve Signing  
**Description:** Evaluation of Chevron and other curve signing improvements completed from 2011 – 2017 on 2-lane rural roads in NC  
**Target Crash Type:** Fixed object  
**Number of Installations:** 56  
**Number of Installations:** 56  
**Miles Treated:**  
**Years Before:** -3  
**Years After:** 3  
**Methodology:** Before/after using empirical Bayes or Full Bayes  
**Results:** CRF = 0.35 for Total, 0.33 for Lane Departure, 0.41 for Injury, 0.38 in Night  
**File Name:** Evaluation Summary Short - Curve Chevron Signing.pdf

**CounterMeasures:** Long life markings and wider lines  
**Description:** Evaluation of long life pavement markings completed from 2014 – 2017 on 2-lane rural roads in NC  
**Target Crash Type:** Fixed object  
**Number of Installations:**  
**Number of Installations:**  
**Miles Treated:** 400  
**Years Before:** -3  
**Years After:** 3  
**Methodology:** Before/after using empirical Bayes or Full Bayes  
**Results:** CRF of Long Life Markings = 0.13 for Lane Departure  
**File Name:** Evaluation Summary Short - Long Life Markings.pdf

**CounterMeasures:** Rumble strips  
**Description:** Evaluation of long life pavement markings completed from 2014 – 2017 on 2-lane rural roads in NC  
**Target Crash Type:** Fixed object  
**Number of Installations:**  
**Number of Installations:**  
**Miles Treated:** 200  
**Years Before:** -3  
**Years After:** 3  
**Methodology:** Before/after using empirical Bayes or Full Bayes  
**Results:** CRF of Long Life Markings = 0.13 for Lane Departure

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File Name: Evaluation Summary Short - Long Life Markings.pdf

## ***Project Effectiveness***

### **Provide the following information for previously implemented projects that the State evaluated this reporting period.**

In an attempt to assess the safety of our roads, the Safety Evaluation Group of the Traffic Safety Systems Management Section has evaluated hundreds of projects. The methodologies used in NCDOT's evaluations offer various philosophies and ideas, in an effort to provide objective countermeasure crash reduction results. This information is gathered so the benefit or lack of benefit for this type of project can be recognized and utilized for future projects. As the Safety Evaluation Group completes additional reviews for various types of countermeasures, we will be able to provide objective and definite information regarding actual crash reduction factors. Completed project evaluations can be found at the web page below: <https://connect.ncdot.gov/resources/safety/Pages/Safety-Evaluation.aspx>

### **Describe any other aspects of HSIP effectiveness on which the State would like to elaborate.**

The North Carolina Highway Safety Improvement Program (HSIP) is an organized and systematic safety process developed to identify, analyze, investigate, and improve potentially hazardous locations with concentrations and patterns of correctable crashes. The program is able to determine locations that exceed minimum warranting criteria that are based on multiple factors that, in most cases, include severity, frequency, and crash type. The program is presently structured into six distinct phases:

- Development of warranting criteria and Identification of potentially hazardous locations meeting minimum warrant criteria
- Detailed crash analysis of program locations
- Engineering field investigation of program locations and evaluation of potential recommendations (where appropriate)
- Project development
- Implement countermeasures
- Evaluation of countermeasures implemented with HSIP funds

The warrants developed by the Traffic Safety Systems Section (TSSS) have consistently shown the ability to identify intersections, sections, and bicycle/pedestrian intersections with severe injuries and chronic crash patterns. The Regional Traffic Engineers utilize thorough investigations, traffic operations and safety expertise and proven tools such as signal warrant studies, sight distance measurements, Crash Reduction Factors and Benefit to Cost analysis to ensure that effective projects are developed. Projects are selected through a competitive Benefit to Cost based program. Evaluations completed by the Traffic Safety Systems Section have shown that the average project yields a 14 to one return.

See the North Carolina 2021 HSIP implementation Plan for additional information and details.

## Compliance Assessment

**What date was the State’s current SHSP approved by the Governor or designated State representative?**

02/05/2020

**What are the years being covered by the current SHSP?**

From: 2019 To: 2023

**When does the State anticipate completing it’s next SHSP update?**

2024

**Provide the current status (percent complete) of MIRE fundamental data elements collection efforts using the table below.**

\*Based on Functional Classification (MIRE 1.0 Element Number) [MIRE 2.0 Element Number]

ROAD TYPE	*MIRE NAME (MIRE NO.)	NON LOCAL PAVED ROADS - SEGMENT		NON LOCAL PAVED ROADS - INTERSECTION		NON LOCAL PAVED ROADS - RAMPS		LOCAL PAVED ROADS		UNPAVED ROADS	
		STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE
ROADWAY SEGMENT	Segment Identifier (12) [12]	100	100					100	100	100	100
	Route Number (8) [8]	100	100								
	Route/Street Name (9) [9]	100	100								
	Federal Aid/Route Type (21) [21]	100	100								
	Rural/Urban Designation (20) [20]	100	100					100	100		
	Surface Type (23) [24]	100						100			
	Begin Point Segment Descriptor (10) [10]	100	100					100	100	100	100
	End Point Segment Descriptor (11) [11]	100	100					100	100	100	100
	Segment Length (13) [13]	100	100								
	Direction of Inventory (18) [18]	100	100								
	Functional Class (19) [19]	100	100					100	100	100	100
Median Type (54) [55]	100										



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ROAD TYPE	*MIRE NAME (MIRE NO.)	NON LOCAL PAVED ROADS - SEGMENT		NON LOCAL PAVED ROADS - INTERSECTION		NON LOCAL PAVED ROADS - RAMPS		LOCAL PAVED ROADS		UNPAVED ROADS	
		STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE
	Access Control (22) [23]	100									
	One/Two Way Operations (91) [93]	100									
	Number of Through Lanes (31) [32]	100	100					10	10		
	Average Annual Daily Traffic (79) [81]	100	100					10	10		
	AADT Year (80) [82]	100	100								
	Type of Governmental Ownership (4) [4]	100						100		100	
<b>INTERSECTION</b>	Unique Junction Identifier (120) [110]			100	100						
	Location Identifier for Road 1 Crossing Point (122) [112]			100	100						
	Location Identifier for Road 2 Crossing Point (123) [113]			100	100						
	Intersection/Junction Geometry (126) [116]										
	Intersection/Junction Traffic Control (131) [131]										
	AADT for Each Intersecting Road (79) [81]										
	AADT Year (80) [82]										
	Unique Approach Identifier (139) [129]										
<b>INTERCHANGE/RAMP</b>	Unique Interchange Identifier (178) [168]					100	100				
	Location Identifier for Roadway at Beginning of Ramp Terminal (197) [187]					100	100				

ROAD TYPE	*MIRE NAME (MIRE NO.)	NON LOCAL PAVED ROADS - SEGMENT		NON LOCAL PAVED ROADS - INTERSECTION		NON LOCAL PAVED ROADS - RAMPS		LOCAL PAVED ROADS		UNPAVED ROADS	
		STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE
	Location Identifier for Roadway at Ending Ramp Terminal (201) [191]					100	100				
	Ramp Length (187) [177]					100	100				
	Roadway Type at Beginning of Ramp Terminal (195) [185]					100	100				
	Roadway Type at End Ramp Terminal (199) [189]					100	100				
	Interchange Type (182) [172]					100	100				
	Ramp AADT (191) [181]					100	100				
	Year of Ramp AADT (192) [182]					100	100				
	Functional Class (19) [19]					100	100				
	Type of Governmental Ownership (4) [4]					100	100				
<b>Totals (Average Percent Complete):</b>		<b>100.00</b>	<b>72.22</b>	<b>37.50</b>	<b>37.50</b>	<b>100.00</b>	<b>100.00</b>	<b>80.00</b>	<b>57.78</b>	<b>100.00</b>	<b>80.00</b>

\*Based on Functional Classification (MIRE 1.0 Element Number) [MIRE 2.0 Element Number]

**Describe actions the State will take moving forward to meet the requirement to have complete access to the MIRE fundamental data elements on all public roads by September 30, 2026.**

There are approximately 107,000 miles of public roads in the State of North Carolina. Of those, the NCDOT maintains approximately 80,000, which equates to approximately 75% of all public roadways in the State. It is important to note that for the purposes of this plan, when referencing State and Non-State in terms of what the State collects it refers to ownership/maintenance; when referencing Non-Local and Local in terms of the MIRE FDE, it refers to functional class.

The Operations Program Management Unit is responsible for collecting and maintaining the roadway inventory, and the GIS unit is responsible for the line work. ESRI Roads and Highways is used to maintain the LRS and many roadway inventory elements. A roadway characteristics file is published every quarter. Anyone can access the roadway inventory GIS files; they are available on the Connect NCDOT website, (<https://connect.ncdot.gov/resources/gis/Pages/GIS-Data-Layers.aspx>).

The Division of Highways has the authority/responsibility for determining the improvements needed to achieve compliance with the MIRE FDE requirements. These decisions are made jointly between Safety, GIS, and the Operations Program Management Unit, with safety driving the need for new elements.

NCDOT completed a gap assessment in January 2017 comparing their roadway inventory to the FDE listing. The gap assessments results are summarized in this section.

*Non-Local Paved Roads*

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### Segments

NCDOT collects and maintains all of the segment elements on all State-owned Non-Local Paved roads. NCDOT collects and maintains almost all of the segment elements on all Non-State owned, Non-Local Paved roads. The exceptions are Surface Type, Median Type, Access Control, One/Two Way Operations, and Type of Governmental Ownership.

### Intersections

The largest gaps in the FDEs for NCDOT are for Intersection data elements. NCDOT does not currently have the majority of the intersection FDEs on Non-Local Paved roads.

### Interchange/Ramp

Of the 11 Interchange/Ramp elements on non-local paved roads, NCDOT maintains 7 on both State and Non-State roads. The 4 missing elements are Interchange Identifier, Location Identifier for Beginning Ramp Terminal, Roadway Type at Beginning Ramp Terminal, and Interchange Type. In early 2021, NCDOT published an interchange inventory that captures all the required MIRE FDE elements.

### *Local Paved Roads*

Of the nine (9) FDEs on Local Paved Roads, all but one (1) (AADT) are collected on all State Roads; and all but 4 (Surface Type, Number of Through Lanes, AADT, and Type of Governmental Ownership) are collected on all Non-State roads.

### *Unpaved Roads*

NCDOT intends to opt out of collecting FDEs on unpaved roads. NCDOT understands: no HSIP funds can be spent on these roadways; they must consult with affected Indian tribes; and they must notify their FHWA Division Office via letter to the Division Administrator.

### **Appropriate Data Collection Methodology**

For the MIRE FDE currently collected, the elements are updated as new roads are added. The GIS group updates the line work annually based on snapshots provided by the Counties.

There are business edits and data checks built into the system to help ensure the quality of the data, however there are no additional formal QA/QC processes. NCDOT is looking into developing performance measures to help formalize their quality practices.

NCDOT recently completed a research project that provided AADT values for all public roadways, as well as a methodology for generating and maintaining this data. That project was completed in 2020. NCDOT also completed an interchange inventory in 2021. This inventory contains all interchanges on all public roads in North Carolina, and has the elements need to satisfy MIRE FDE requirements.

NCDOT is working on an intersection inventory as well. This effort is currently being scoped, with hopes to begin soon.

NCDOT also became a member of the Applications of Enterprise GIS for Transportation, Guidance for a National Transportation Framework (AEGIST) pooled fund study in 2020. This pooled fund study will develop standards for a national transportation dataset as well as document best practices for linear referencing systems to maximize data quality and interoperability. One of the initial focuses of the group will be to evaluate preferred methods for managing intersection data in a linear referencing system. MIRE accommodations are a large part of this effort.

### **Coordination with Other Agencies**

The largest data gaps exist on Non-State roads. NCDOT plans to analyze the mileage and ownership for the roadways with missing FDEs. Once that effort is complete, NCDOT can determine where there are the largest data gaps and what outreach mechanism might be most effective to working with those local agencies. This will help NCDOT determine if they can utilize information already being collected by local agencies, or if a State sponsored data collection effort is needed to obtain the data on these roadways. NCDOT is also exploring the use of non-traditional sources for this type of information on non-system roadways.

### **Prioritization Criteria for Collection MIRE FDE on All Public Roads**

The FDE collection priorities are as follows:

- Short-term: Intersection elements, and any other remaining Non-Local paved road elements.

## 2021 North Carolina Highway Safety Improvement Program

- Mid-term: Remaining needed Local Paved Roads elements.

The data will be collected using a variety of tools including deriving elements from existing data, collecting from video logs, utilizing current pavement collection efforts to determine what else might be able to be collected at the same time, and utilizing data already being collected from local agencies. This includes exploring what additional information might be collected when the annual linework is collected from the Counties and what additional mechanisms might need to be put in place to be able to obtain these data. NCDOT is also exploring if the E911 effort might be able to be utilized to obtain additional data. NCDOT will also explore utilizing the available FHWA technical assistance programs, primarily the Roadway Data Extraction Technical Assistance Program (RDETAP), to help fill in data gaps.

The Safety Group will be responsible for the data collection effort, with support from the Operations Program Management Unit. The data will be integrated into the existing GIS system and be made available through the same portal as other roadway inventory data. The update cycle will vary based on element.

### **Costs and Resources for Data Collection**

NCDOT has not yet developed any cost estimates, but recognizes that this is one of the next steps needed to be conducted. NCDOT will review the FHWAMIRE *Fundamental Data Elements Cost-Benefit Estimation* report as a starting point,

[https://safety.fhwa.dot.gov/rsdp/downloads/fhwasa16035\\_051916v10.pdf](https://safety.fhwa.dot.gov/rsdp/downloads/fhwasa16035_051916v10.pdf) .

As mentioned above, NCDOT will also explore utilizing the available FHWA technical assistance programs, namely the RDETAP, to help fill in data gaps, as well as utilizing available TRCC funds for data collection efforts.

## **Optional Attachments**

Program Structure:

Project Implementation:

Safety Performance:

Evaluation:

Evaluation Summary Short - Curve Chevron Signing.pdf

Evaluation Summary Short - Long Life Markings.pdf

Compliance Assessment:

## Glossary

**5 year rolling average:** means the average of five individuals, consecutive annual points of data (e.g. annual fatality rate).

**Emphasis area:** means a highway safety priority in a State's SHSP, identified through a data-driven, collaborative process.

**Highway safety improvement project:** means strategies, activities and projects on a public road that are consistent with a State strategic highway safety plan and corrects or improves a hazardous road location or feature or addresses a highway safety problem.

**HMVMT:** means hundred million vehicle miles traveled.

**Non-infrastructure projects:** are projects that do not result in construction. Examples of non-infrastructure projects include road safety audits, transportation safety planning activities, improvements in the collection and analysis of data, education and outreach, and enforcement activities.

**Older driver special rule:** applies if traffic fatalities and serious injuries per capita for drivers and pedestrians over the age of 65 in a State increases during the most recent 2-year period for which data are available, as defined in the Older Driver and Pedestrian Special Rule Interim Guidance dated February 13, 2013.

**Performance measure:** means indicators that enable decision-makers and other stakeholders to monitor changes in system condition and performance against established visions, goals, and objectives.

**Programmed funds:** mean those funds that have been programmed in the Statewide Transportation Improvement Program (STIP) to be expended on highway safety improvement projects.

**Roadway Functional Classification:** means the process by which streets and highways are grouped into classes, or systems, according to the character of service they are intended to provide.

**Strategic Highway Safety Plan (SHSP):** means a comprehensive, multi-disciplinary plan, based on safety data developed by a State Department of Transportation in accordance with 23 U.S.C. 148.

**Systematic:** refers to an approach where an agency deploys countermeasures at all locations across a system.

**Systemic safety improvement:** means an improvement that is widely implemented based on high risk roadway features that are correlated with specific severe crash types.

**Transfer:** means, in accordance with provisions of 23 U.S.C. 126, a State may transfer from an apportionment under section 104(b) not to exceed 50 percent of the amount apportioned for the fiscal year to any other apportionment of the State under that section.