NORTH CAROLINA

HIGHWAY SAFETY IMPROVEMENT PROGRAM

2017 ANNUAL REPORT

U.S. Department of Transportation
Federal Highway Administration

Photo source: Federal Highway Administration

Table of Contents

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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 ultimate 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 2016, there were over 297,000 reported traffic crashes that resulted in 1,441 persons killed and over 130,000 injuries on our roadways. The socioeconomic impact of these crashes is severe, resulting in a loss of over $26.6 billion to the economy of North Carolina annually. This impact translates to a crash cost to the state of over $3.0 million every hour and approximately $73 million every day and a staggering social impact as well. 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. The Executive Committee for Highway Safety has adopted a goal to cut the fatalities and serious injuries in North Carolina in half based on the 2013 figures, reducing the total annual fatalities by 630 fatalities and the total serious injuries by 1,055 serious injuries before 2030.

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 2016 Calendar Year as the reporting period for the “HSIP Report”; however, some of our 2017 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 a 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

Enter additional comments here to clarify your response for this question or add supporting information.

NCDOT’s Traffic Safety Unit has 43 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

Enter additional comments here to clarify your response for this question or add supporting information.

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 Pilot 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.

Traffic Engineering/Safety
Design
Planning
Operations
Governors Highway Safety Office

Enter additional comments here to clarify your response for this question or add supporting information.

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 Policy to Projects 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. MPO's and RPO's utilize traffic crash data to develop and prioritize transportation plans. Many resurfacing projects are utilizing safety edge treatments to reduce the potential for overcorrection-type crashes.

Identify which external partners are involved with HSIP planning.

Regional Planning Organizations (e.g. MPOs, RPOs, COGs)
Governors Highway Safety Office
Local Government Agency
Other-NC State Highway Patrol
Other-Rail Division and Bike/Ped Division
Other-Rural Planning Organizations

Enter additional comments here to clarify your response for this question or add supporting information.

Describe coordination with external partners.

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 NC Transportation Secretary chairs the NC Executive Committee for Highway Safety and partner agency representatives are actively involved in the committee. Planning Organizations utilize traffic safety data to develop and prioritize transportation plans. Members of the NC State Highway Patrol also regularly participate in NCDOT's Road Safety Review Program.

Have any program administration practices used to implement the HSIP changed since the last reporting period?

No

Are there any other aspects of HSIP Administration on which the State would like to elaborate?

Yes

Describe other aspects of HSIP Administration on which the State would like to elaborate.
An update of the Strategic Highway Safety Plan (SHSP) for the State of North Carolina was launched in 2015. This SHSP (also referenced herein as the Plan) is an important component of North Carolina's Highway Safety Improvement Program (HSIP). The need for a SHSP was established by the federal transportation funding legislation, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), and strengthened by the passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) in July 2012. MAP-21 specifies that the SHSP must be developed based on safety data on all public roads, be developed in consultation with stakeholders, employ a multidisciplinary approach, describe a program of safety strategies, and consider other highway safety plans and processes.

This updated SHSP was developed through the collaborative efforts of diverse safety stakeholders representing the users of the North Carolina 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. Serious injuries are those obviously serious enough to prevent the injured person from performing his or her normal activities for at least one day beyond the day of the crash. These are also called Type A injuries (suspected serious injuries).

The North Carolina SHSP was first developed in 2004 by the North Carolina Executive Committee for Highway Safety (ECHS) in support of the American Association of State Highway and Transportation Officials (AASHTO) Strategic Highway Safety Plan. The ECHS adopted AASHTO's goal to reduce the statewide fatality rate to 1.0 fatalities per 100 million vehicle miles traveled (MVMT). The revised plan of 2006 identified 14 emphasis areas. Significant progress was made toward the Plan's overall goal, resulting in a dramatic decrease in the number of fatalities per 100 million vehicle miles traveled (MVMT) over the eight-year period from 2006 to 2013. The 2015 fatality rate is above 1.2 fatalities per 100 MVMT. Nationally, the fatality rate has also declined during the same period, although not as sharply as in North Carolina. Evaluations of North Carolina's engineering safety programs have demonstrated that the collaborative and focused statewide efforts of the SHSP in recent years have contributed to the reductions in fatalities and serious injuries. Many other factors may also have contributed to this decline, such as vehicle enhancements and economic influences.

Although the safety stakeholders implementing the Plan have made significant progress in achieving the statewide goal since 2006, there is still work to be done. In 2016, 1,441 people died on North Carolina's roadways, and another 2,976 people were seriously injured. Additionally, the downward trend in fatalities and serious injuries has flattened over the last few years. The update of the original State SHSP—presents refined goals and objectives, new safety emphasis areas, and additional strategies and actions to build on past success and to continue to reduce fatalities and serious injuries on North Carolina's roadways. This document can be found on the web at http://ncshsp.org/.

The goals of the Plan will be achieved through the implementation of strategies and actions in nine safety emphasis areas. These emphasis areas represent the greatest opportunity for the safety stakeholders to focus their efforts to achieve the goals of this Plan. The safety stakeholders selected these emphasis areas cooperatively through a data-driven approach, noting that many individual crashes can be attributed to more than one emphasis area. For example, a crash may involve speeding, intersection safety, and occupant protection. Therefore, the following nine emphasis areas provide an opportunity to address crashes from multiple perspectives.

-Demographic Considerations
-Driving While Impaired
-Emerging Issues and Data
-Intersection Safety
-Keeping Drivers Alert
-Lane Departure
-Occupant Protection/Motorcycles
-Pedestrians and Bicyclists
-Speed

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.

In 2016, Governor Pat McCrory announced that $50 million would be dedicated to improving highway safety and reducing the number of traffic accidents throughout North Carolina. Improvements supported by the funds included high friction surface treatments, turn lanes, guardrails and traffic signals. The $50 million are state funds advanced to the projects that NCDOT will request reimbursement payments through the federal HSIP.

In the fall of 2015, FHWA conducted a national HSIP scan tour. The tour team visited North Carolina, because the state was identified as a high-performing state. The scan tour report noted several noteworthy practices in North Carolina including:

-Documentation of HSIP Processes

-Coordination with Internal and External Partners

-Understanding the Relationship between the SHSP and HSIP

-Making Data-Driven Safety Decisions

-Addressing Local Road Needs

-Considering All "4E's"

-Identifying Opportunites to Streamline Project Delivery

-Evaluating the Success of the Program

Program Methodology

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

No

Enter additional comments here to clarify your response for this question or add supporting information.

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 2013-2017, 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.

Select the programs that are administered under the HSIP.

Median Barrier
Intersection
Horizontal Curve
Bicycle Safety
Roadway Departure
Pedestrian Safety

Enter additional comments here to clarify your response for this question or add supporting information.

Program: Bicycle Safety

Date of Program Methodology: 8/31/2016

What is the justification for this program? [Check all that apply]

Addresses SHSP priority or emphasis area

What is the funding approach for this program? [Check one]

Competes with all projects

What data types were used in the program methodology? [Check all that apply]

Crashes	Exposure	Roadway
Other-Bicycle Crashes		

What project identification methodology was used for this program? [Check all that apply]

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

Describe the methodology used to identify local road projects as part of this program.

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

Other-Regional Priority : 2
Other-Division Priority : 2
Other-Severity Index : 4
Other-Potentially Hazardous Listing : 5

Enter additional comments here to clarify your response for this question or add supporting information.

Program: Horizontal Curve

Date of Program Methodology: 8/31/2016

What is the justification for this program? [Check all that apply]

What is the funding approach for this program? [Check one]

What data types were used in the program methodology? [Check all that apply]

Crashes	Exposure	Roadway
All crashes	Volume	

What project identification methodology was used for this program? [Check all that apply]

Excess proportions of specific crash types
Other-Road Departure Crashes in a Curve
Other-Proportion of night crashes
Other-Proportion of wet road condition crashes

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

No

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

Yes

Describe the methodology used to identify local road projects as part of this program.

How are projects under this program advanced for implementation?

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

Other-Regional Priority : 2
Other-Division Priority : 2
Other-Severity Index : 4
Other-Program Listing or RSA Location : 5

Enter additional comments here to clarify your response for this question or add supporting information.

Program: Intersection

Date of Program Methodology: 8/31/2016

What is the justification for this program? [Check all that apply]

What is the funding approach for this program? [Check one]

What data types were used in the program methodology? [Check all that apply]

Crashes **Exposure** **Roadway**

All crashes

What project identification methodology was used for this program? [Check all that apply]

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

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

Describe the methodology used to identify local road projects as part of this program.

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

Other-Regional Priority : 2
Other-Division Priority : 2
Other-Severity Index : 4
Other-Potential Hazardous Listing or RSA Location : 5

Enter additional comments here to clarify your response for this question or add supporting information.

Program: Median Barrier

Date of Program Methodology: 8/31/2016

What is the justification for this program? [Check all that apply]

What is the funding approach for this program? [Check one]

What data types were used in the program methodology? [Check all that apply]

Crashes	Exposure	Roadway
		Median width
		Other-Freeway

What project identification methodology was used for this program? [Check all that apply]

Other-Median Width

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

No

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

Yes

Describe the methodology used to identify local road projects as part of this program.

How are projects under this program advanced for implementation?

Other-By NCDOT roadway design standards, divided freeways with a median width below specified standards are required to have median barrier.

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).

Enter additional comments here to clarify your response for this question or add supporting information.

Program: Pedestrian Safety

2017 North Carolina Highway Safety Improvement Program

Date of Program Methodology: 8/31/2016

What is the justification for this program? [Check all that apply]

What is the funding approach for this program? [Check one]

What data types were used in the program methodology? [Check all that apply]

Crashes	Exposure	Roadway
All crashes Other-Pedestrian Crashes		

What project identification methodology was used for this program? [Check all that apply]

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

Describe the methodology used to identify local road projects as part of this program.

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

Other-Regional Priority : 2
Other-Division Priority : 2
Other-Severity Index : 4
Other-Potentially Hazardous Listing or RSA : 5

Enter additional comments here to clarify your response for this question or add supporting information.

Program: Roadway Departure

Date of Program Methodology: 8/31/2016

What is the justification for this program? [Check all that apply]

Addresses SHSP priority or emphasis area

What is the funding approach for this program? [Check one]

Competes with all projects

What data types were used in the program methodology? [Check all that apply]

Crashes	Exposure	Roadway
All crashes Other-Roadway Departure Crashes		

What project identification methodology was used for this program? [Check all that apply]

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

Describe the methodology used to identify local road projects as part of this program.

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

Other-Regional Priority : 2
Other-Division Priority : 2
Other-Severity Index : 4
Other-Potentially Hazardous Listing or RSA Location : 5

Enter additional comments here to clarify your response for this question or add supporting information.

What percentage of HSIP funds address systemic improvements?

7

HSIP funds are used to address which of the following systemic improvements? Please check all that apply.

Install/Improve Pavement Marking and/or Delineation
Upgrade Guard Rails

Enter additional comments here to clarify your response for this question or add supporting information.

What process is used to identify potential countermeasures? [Check all that apply]

Engineering Study
Road Safety Assessment

Enter additional comments here to clarify your response for this question or add supporting information.

Our regional traffic engineering staff annually investigate about 200 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 10 Road Safety Audits annually utilizing independent, multi-disciplinary teams. 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

Enter additional comments here to clarify your response for this question or add supporting information.

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.

While NCDOT does not currently use the predictive methodologies discussed in Chapter 4 of the HSM; NCDOT's Roadway Safety Management Process does use many HSM techniques for diagnosis, countermeasure selection, economic appraisal, project prioritization and safety evaluations.

Have any program methodology practices used to implement the HSIP changed since the last reporting period?

Yes

Describe program methodology practices that have changed since the last reporting period.

NC’s HSIP program has many opportunities for growth. They include training and utilizing contract forces for preliminary engineering and design; this will allow the department to study additional sites and more opportunities to find additional cost-effective safety projects.

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.

Are there any other aspects of the HSIP methodology on which the State would like to elaborate?

Yes

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 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.

Project Implementation

Funds Programmed

Reporting period for HSIP funding.

State Fiscal Year

Enter additional comments here to clarify your response for this question or add supporting information.

The reporting period is the NC Fiscal Year which is July 1, 2016 to June 30, 2017.

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

FUNDING CATEGORY	PROGRAMMED	OBLIGATED	% OBLIGATED/PROGRAMMED
HSIP (23 U.S.C. 148)	$48,871,921	$97,607,855	199.72%
HRRR Special Rule (23 U.S.C. 148(g)(1))	$0	$551,084	0%
Penalty Funds (23 U.S.C. 154)	$0	$0	0%
Penalty Funds (23 U.S.C. 164)	$0	$45,000	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	$12,392,390	$12,392,390	100%
Totals	$61,264,311	$110,596,329	180.52%

Enter additional comments here to clarify your response for this question or add supporting information.

It often takes over a year to start construction on a project programmed for funding. So, the projects that we programmed this year are largely not the same projects in which funds were obligated this year. We have numerous projects in the pipeline in the PE, ROW, or Construction phase; so, the obligated funds shown in the table are from projects that have been programmed over several years.

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

$43,000

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

$0

Enter additional comments here to clarify your response for this question or add supporting information.

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

$0

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

$0

Enter additional comments here to clarify your response for this question or add supporting information.

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

Enter additional comments here to clarify your response for this question or add supporting information.

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.

Does the State want to elaborate on any other aspects of it's progress in implementing HSIP projects?

Yes

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.

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

													RELATIONSHIP TO SHSP	
PROJECT NAME	**IMPROVEMENT CATEGORY**	**SUBCATEGORY**	**OUTPUTS**	**OUTPUT TYPE**	**HSIP PROJECT COST($)**	**TOTAL PROJECT COST($)**	**FUNDING CATEGORY**	**FUNCTIONAL CLASSIFICATION**	**AADT**	**SPEED**	**OWNERSHIP**	**METHOD FOR SITE SELECTION**	**EMPHASIS AREA**	**STRATEGY**
I-5314	Alignment	Vertical alignment or elevation change	1	Miles	$835000	$927777	HSIP (23 U.S.C. 148)		51,000		State Highway Agency	Spot	Lane Departure	
I-5809	Roadway	Pavement surface - high friction surface	1	Locations	$121500	$135000	HSIP (23 U.S.C. 148)		26,000		State Highway Agency	Spot	Lane Departure	
R-5311A	Interchange design	Convert at-grade intersection to interchange	1	Intersections	$5319000	$5910000	HSIP (23 U.S.C. 148)		6,500		State Highway Agency	Spot	Intersections	
SF-4914C	Roadside	Barrier- metal	1	Miles	$22848	$25386	Other Federal-aid Funds (i.e. STBG, NHPP)		1,800		State Highway Agency	Spot	Lane Departure	
SF-4914D	Roadside	Barrier- metal	1	Miles	$10462	$11624	Other Federal-aid Funds (i.e. STBG, NHPP)		340		State Highway Agency	Spot	Lane Departure	
SS-PE	Non-infrastructure	Transportation safety planning	278	Numbers	$1161982	$1291091	HSIP (23 U.S.C. 148)		0		State Highway Agency		Non-infrastructure	
W-4712	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$216129	$240143	HSIP (23 U.S.C. 148)		0		State Highway Agency	Spot	Lane Departure	
W-5147	Pedestrians and bicyclists	Crosswalk	1	Locations	$51928	$57697	HSIP (23 U.S.C. 148)		0		State Highway Agency	Spot	Intersections	
W-5202E	Roadway	Roadway widening - add lane(s) along segment	0.73	Miles	$14057	$15618	HSIP (23 U.S.C. 148)		6,700		State Highway Agency	Spot	Lane Departure	
W-5203B	Roadway	Rumble strips - unspecified or other	6.5	Miles	$3549	$3943	HSIP (23 U.S.C. 148)		0		State Highway Agency	Spot	Lane Departure	
W-5203C	Intersection geometry	Intersection geometry - other	1	Intersections	$1996	$2217	HSIP (23 U.S.C. 148)		0		State Highway Agency	Spot	Intersections	
W-5203D	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$8055	$8950	HSIP (23 U.S.C. 148)		0		State Highway Agency	Spot	Intersections	
W-5203I	Alignment	Horizontal curve realignment	1	Curves	$769500	$855000	HSIP (23 U.S.C. 148)		5,700		State Highway Agency	Spot	Lane Departure	
W-5203L	Shoulder treatments	Widen shoulder - paved or other	3.6	Miles	$1089000	$1210000	HSIP (23 U.S.C. 148)		3,100		State Highway Agency	Spot	Lane Departure	
W-5203W	Intersection geometry	Intersection geometry - other	1	Intersections	$954900	$1061000	HSIP (23 U.S.C. 148)		12,000		State Highway Agency	Spot	Intersections	
W-5203X	Intersection geometry	Intersection geometry - other	1	Intersections	$2205000	$2450000	HSIP (23 U.S.C. 148)		16,000		State Highway Agency	Spot	Intersections	
W-5204I	Alignment	Horizontal curve realignment	11.4	Miles	$43	$47	HSIP (23 U.S.C. 148)		1,000		State Highway Agency	Spot	Lane Departure	
W-5205I	Intersection traffic control	Intersection traffic control - other	1	Intersections	$50	$55	HSIP (23 U.S.C. 148)		17,300		State Highway Agency	Spot	Intersections	

													RELATIONSHIP TO SHSP	
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
W-5205K	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$135000	$150000	Other Federal-aid Funds (i.e. STBG, NHPP)		6,600		State Highway Agency	Spot	Intersections	
W-5205S	Shoulder treatments	Widen shoulder - paved or other	4.3	Miles	$1080000	$1200000	HSIP (23 U.S.C. 148)		3,700		State Highway Agency	Spot	Lane Departure	
W-5205U	Roadway	Roadway widening - curve	1	Curves	$30046	$33384	HSIP (23 U.S.C. 148)		14,000		State Highway Agency	Spot	Lane Departure	
W-5205V	Intersection geometry	Intersection geometry - other	1	Intersections	$207000	$230000	HSIP (23 U.S.C. 148)		4,200		State Highway Agency	Spot	Intersections	
W-5206AB	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$9807	$10896	HSIP (23 U.S.C. 148)		17,000		State Highway Agency	Spot	Intersections	
W-5206AG	Pedestrians and bicyclists	Pedestrian bridge	1	Locations	$3518	$3908	HSIP (23 U.S.C. 148)		10,000		State Highway Agency	Spot	Pedestrians	
W-5206I	Intersection traffic control	Modify control - two-way stop to roundabout	1	Intersections	$479153	$532392	HSIP (23 U.S.C. 148)		0		State Highway Agency	Spot	Intersections	
W-5206N	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$732572	$813968	HSIP (23 U.S.C. 148)		3,800		State Highway Agency	Spot	Intersections	
W-5206O	Roadway	Superelevation / cross slope	1	Curves	$5798	$6442	Other Federal-aid Funds (i.e. STBG, NHPP)		4,800		State Highway Agency	Spot	Lane Departure	
W-5206P	Roadway	Pavement surface - miscellaneous	1	Miles	$333	$370	HSIP (23 U.S.C. 148)		26,000		State Highway Agency	Spot	Lane Departure	
W-5206U	Intersection traffic control	Intersection traffic control - other	1	Intersections	$376483	$418314	Other Federal-aid Funds (i.e. STBG, NHPP)		11,000		State Highway Agency	Spot	Intersections	
W-5206U	Intersection traffic control	Intersection traffic control - other	1	Intersections	$93317	$103685	HSIP (23 U.S.C. 148)		11,000		State Highway Agency	Spot	Intersections	
W-5207D	Intersection geometry	Intersection geometry - other	1	Intersections	$2609	$2898	HSIP (23 U.S.C. 148)		0		State Highway Agency	Spot	Intersections	
W-5207G	Alignment	Vertical alignment or elevation change	0.1	Miles	$510	$566	HSIP (23 U.S.C. 148)		0		State Highway Agency	Spot	Intersections	
W-5207J	Roadway	Pavement surface - miscellaneous	0.21	Miles	$21409	$23787	HSIP (23 U.S.C. 148)		3,900		State Highway Agency	Spot	Lane Departure	
W-5208G	Alignment	Horizontal curve realignment	1	Curves	$7323	$8136	HSIP (23 U.S.C. 148)		2,700		State Highway Agency	Spot	Lane Departure	
W-5208I	Lighting	Intersection lighting	1	Intersections	$280	$311	HSIP (23 U.S.C. 148)		10,000		State Highway Agency	Spot	Intersections	
W-5210F	Intersection traffic control	Modify control - two-way stop to roundabout	1	Intersections	$493	$547	Other Federal-aid Funds (i.e. STBG, NHPP)		3,500		State Highway Agency	Spot	Intersections	
W-5210H	Access management	Raised island - install new	1	Miles	$242854	$269837	HSIP (23 U.S.C. 148)		28,000		State Highway Agency	Spot	Lane Departure	

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PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
W-5210L	Intersection geometry	Intersection geometry - other	1	Intersections	$45000	$50000	HSIP (23 U.S.C. 148)		36,000		State Highway Agency	Spot	Intersections	
W-5210N	Intersection geometry	Intersection geometry - other	1	Intersections	$67704	$75226	HSIP (23 U.S.C. 148)		8,600		State Highway Agency	Spot	Intersections	
W-5212M	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$274402	$304891	HSIP (23 U.S.C. 148)		0		State Highway Agency	Spot	Intersections	
W-5212N	Roadway	Roadway widening - add lane(s) along segment	1	Miles	$1800000	$2000000	HSIP (23 U.S.C. 148)		12,000		State Highway Agency	Spot	Lane Departure	
W-5214G	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$1299	$1443	HSIP (23 U.S.C. 148)		7,200		State Highway Agency	Spot	Intersections	
W-5214K	Roadside	Barrier- metal	0.95	Miles	$5283	$5870	HSIP (23 U.S.C. 148)		1,000		State Highway Agency	Spot	Lane Departure	
W-5307	Alignment	Horizontal curve realignment	0.2	Miles	$354827	$394252	HSIP (23 U.S.C. 148)		0		State Highway Agency	Spot	Lane Departure	
W-5313	Shoulder treatments	Widen shoulder - paved or other	7.4	Miles	$8190000	$9100000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Spot	Lane Departure	
W-5501	Intersection traffic control	Modify control - two-way stop to roundabout	1	Intersections	$14682	$16313	HSIP (23 U.S.C. 148)		0		State Highway Agency	Spot	Intersections	
W-5503	Roadway delineation	Longitudinal pavement markings - remarking	1	Miles	$2250000	$2500000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Spot	Lane Departure	
W-5510	Access management	Raised island - install new	0.3	Miles	$1251109	$1390121	HSIP (23 U.S.C. 148)		340,000		State Highway Agency	Spot	Lane Departure	
W-5515	Shoulder treatments	Widen shoulder - paved or other	4.8	Miles	$135000	$150000	HSIP (23 U.S.C. 148)		1,200		State Highway Agency	Spot	Lane Departure	
W-5517	Non-infrastructure	Transportation safety planning	278	Numbers	$4950000	$5500000	HSIP (23 U.S.C. 148)		0		State Highway Agency			
W-5520	Intersection geometry	Intersection geometry - other	1	Intersections	$9986123	$11095692	HSIP (23 U.S.C. 148)		60,000		State Highway Agency	Spot	Lane Departure	
W-5521	Alignment	Horizontal curve realignment	1	Curves	$90000	$100000	HSIP (23 U.S.C. 148)		7,600		State Highway Agency	Spot	Intersections	
W-5522	Pedestrians and bicyclists	Miscellaneous pedestrians and bicyclists	1	Locations	$270000	$300000	HSIP (23 U.S.C. 148)		9,300		State Highway Agency	Spot	Intersections	
W-5601A	Alignment	Horizontal curve realignment	0.26	Miles	$182250	$202500	HSIP (23 U.S.C. 148)		4,800		State Highway Agency	Spot	Lane Departure	
W-5601AB	Intersection traffic control	Intersection traffic control - other	1	Intersections	$81000	$90000	HSIP (23 U.S.C. 148)		6,000		State Highway Agency	Spot	Intersections	
W-5601AC	Intersection traffic control	Modify control - two-way stop to roundabout	1	Intersections	$180000	$200000	HSIP (23 U.S.C. 148)		3,500		State Highway Agency	Spot	Intersections	
W-5601AE	Shoulder treatments	Widen shoulder - paved or other	0.98	Miles	$518335	$575927	HSIP (23 U.S.C. 148)		1,700		State Highway Agency	Spot	Lane Departure	
W-5601AG	Pedestrians and bicyclists	Medians and pedestrian refuge areas	0.5	Miles	$1980000	$2200000	HSIP (23 U.S.C. 148)		11,000		State Highway Agency	Spot	Lane Departure	

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W-5601AH	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$486000	$540000	HSIP (23 U.S.C. 148)		13,000		State Highway Agency	Spot	Intersections	
W-5601AI	Roadside	Barrier- metal	1.34	Miles	$20590	$22877	HSIP (23 U.S.C. 148)		2,900		State Highway Agency	Spot	Lane Departure	
W-5601AM	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$580500	$645000	HSIP (23 U.S.C. 148)		6,950		State Highway Agency	Spot	Intersections	
W-5601AN	Intersection traffic control	Systemic improvements - signal-controlled	2	Numbers	$500	$555	HSIP (23 U.S.C. 148)		8,100		State Highway Agency	Spot	Intersections	
W-5601AO	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$234000	$260000	HSIP (23 U.S.C. 148)		21,000		State Highway Agency	Spot	Intersections	
W-5601AQ	Pedestrians and bicyclists	Install new crosswalk	1	Locations	$203400	$226000	HSIP (23 U.S.C. 148)		32,000		State Highway Agency	Spot	Pedestrians	
W-5601AR	Roadway	Superelevation / cross slope	1	Curves	$192600	$214000	HSIP (23 U.S.C. 148)		3,600		State Highway Agency	Spot	Lane Departure	
W-5601AT	Roadway	Superelevation / cross slope	0.38	Miles	$256318	$284797	HSIP (23 U.S.C. 148)		3,400		State Highway Agency	Spot	Lane Departure	
W-5601AV	Pedestrians and bicyclists	Pedestrian signal - install new at intersection	1	Intersections	$126000	$140000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Spot	Intersections	
W-5601BA	Roadway	Roadway narrowing (road diet, roadway reconfiguration)	0.38	Miles	$9000	$10000	HSIP (23 U.S.C. 148)		14,000		State Highway Agency	Spot	Lane Departure	
W-5601BD	Access management	Median crossover - directional crossover	1	Crossovers	$588600	$654000	HSIP (23 U.S.C. 148)		22,000		State Highway Agency	Spot	Intersections	
W-5601BE	Roadway	Pavement surface - high friction surface	1	Locations	$23400	$26000	HSIP (23 U.S.C. 148)		5,600		State Highway Agency	Spot	Lane Departure	
W-5601BH	Intersection traffic control	Modify control - two-way stop to roundabout	1	Intersections	$741600	$824000	HSIP (23 U.S.C. 148)		7,000		State Highway Agency	Spot	Intersections	
W-5601BI	Interchange design	Installation of new lane on ramp	1	Ramps	$360000	$400000	HSIP (23 U.S.C. 148)		12,000		State Highway Agency	Spot	Intersections	
W-5601BK	Intersection geometry	Intersection geometry - other	1	Intersections	$315000	$350000	HSIP (23 U.S.C. 148)		3,900		State Highway Agency	Spot	Intersections	
W-5601BQ	Roadside	Barrier- metal	0.37	Miles	$1101	$1223	HSIP (23 U.S.C. 148)		930		State Highway Agency	Spot	Lane Departure	
W-5601BS	Intersection geometry	Intersection geometrics - modify skew angle	1	Intersections	$90000	$100000	HSIP (23 U.S.C. 148)		4,300		State Highway Agency	Spot	Lane Departure	
W-5601BV	Intersection traffic control	Modify control - two-way stop to roundabout	1	Intersections	$38700	$43000	HSIP (23 U.S.C. 148)		4,100		State Highway Agency	Spot	Intersections	
W-5601BW	Intersection geometry	Auxiliary lanes - add right-turn lane	1	Intersections	$7200	$8000	HSIP (23 U.S.C. 148)		13,000		State Highway Agency	Spot	Intersections	
W-5601BZ	Roadway	Superelevation / cross slope	1	Curves	$156206	$173562	HSIP (23 U.S.C. 148)		860		State Highway Agency	Spot	Lane Departure	
W-5601CC	Roadway	Superelevation / cross slope	1	Curves	$639900	$711000	HSIP (23 U.S.C. 148)		930		State Highway Agency	Spot	Lane Departure	

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W-5601CD	Pedestrians and bicyclists	Medians and pedestrian refuge areas	0.7	Miles	$36000	$40000	HSIP (23 U.S.C. 148)		21,000		State Highway Agency	Spot	Pedestrians	
W-5601CE	Access management	Median crossover - directional crossover	1.2	Miles	$1845000	$2050000	HSIP (23 U.S.C. 148)		23,000		State Highway Agency	Spot	Intersections	
W-5601CF	Access management	Median crossover - directional crossover	3	Crossovers	$733500	$815000	HSIP (23 U.S.C. 148)		13,000		State Highway Agency	Spot	Intersections	
W-5601CJ	Roadway	Superelevation / cross slope	1	Curves	$526500	$585000	HSIP (23 U.S.C. 148)		8,400		State Highway Agency	Spot	Lane Departure	
W-5601CL	Access management	Median crossover - directional crossover	1	Crossovers	$225000	$250000	HSIP (23 U.S.C. 148)		14,000		State Highway Agency	Spot	Intersections	
W-5601CO	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$18000	$20000	HSIP (23 U.S.C. 148)		12,250		State Highway Agency	Spot	Intersections	
W-5601CR	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$454500	$505000	HSIP (23 U.S.C. 148)		30,000		State Highway Agency	Spot	Intersections	
W-5601CT	Intersection geometry	Intersection geometry - other	1	Intersections	$652500	$725000	HSIP (23 U.S.C. 148)		27,000		State Highway Agency	Spot	Intersections	
W-5601CW	Access management	Median crossover - directional crossover	1	Crossovers	$315000	$350000	HSIP (23 U.S.C. 148)		23,000		State Highway Agency	Spot	Intersections	
W-5601CX	Roadway	Superelevation / cross slope	2	Curves	$549000	$610000	HSIP (23 U.S.C. 148)		3,400		State Highway Agency	Spot	Lane Departure	
W-5601CY	Intersection traffic control	Intersection traffic control - other	1	Intersections	$502200	$558000	HSIP (23 U.S.C. 148)		19,000		State Highway Agency	Spot	Intersections	
W-5601DA	Access management	Median crossover - directional crossover	1	Crossovers	$90000	$100000	HSIP (23 U.S.C. 148)		23,000		State Highway Agency	Spot	Intersections	
W-5601DC	Intersection traffic control	Modify control - modifications to roundabout	1	Intersections	$1234800	$1372000	HSIP (23 U.S.C. 148)		4,900		State Highway Agency	Spot	Intersections	
W-5601DD	Alignment	Horizontal curve realignment	1	Miles	$603000	$670000	HSIP (23 U.S.C. 148)		6,500		State Highway Agency	Spot	Lane Departure	
W-5601DE	Pedestrians and bicyclists	Install new crosswalk	1	Locations	$4500	$5000	HSIP (23 U.S.C. 148)		18,000		State Highway Agency	Spot	Pedestrians	
W-5601DF	Shoulder treatments	Widen shoulder - paved or other	4.12	Miles	$1044000	$1160000	HSIP (23 U.S.C. 148)		3,500		State Highway Agency	Spot	Lane Departure	
W-5601DK	Intersection geometry	Intersection geometry - other	2	Intersections	$360000	$400000	HSIP (23 U.S.C. 148)		11,000		State Highway Agency	Spot	Intersections	
W-5601DP	Shoulder treatments	Pave existing shoulders	3.7	Miles	$67500	$75000	HSIP (23 U.S.C. 148)		3,600		State Highway Agency	Spot	Lane Departure	
W-5601DU	Roadside	Barrier- metal	2.54	Miles	$450000	$500000	HSIP (23 U.S.C. 148)		4,000		State Highway Agency	Spot	Lane Departure	
W-5601DY	Intersection geometry	Intersection geometrics - modify skew angle	1	Intersections	$112500	$125000	HSIP (23 U.S.C. 148)		3,300		State Highway Agency	Spot	Intersections	
W-5601DZ	Access management	Median crossover - directional crossover	1	Crossovers	$234000	$260000	HSIP (23 U.S.C. 148)		15,000		State Highway Agency	Spot	Intersections	

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W-5601E	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	1	Intersections	$68400	$76000	HSIP (23 U.S.C. 148)		23,000		State Highway Agency	Spot	Intersections	
W-5601EA	Alignment	Horizontal curve realignment	0.3	Miles	$405000	$450000	HSIP (23 U.S.C. 148)		3,200		State Highway Agency	Spot	Lane Departure	
W-5601EB	Access management	Median crossover - directional crossover	1	Crossovers	$665000	$738888	HSIP (23 U.S.C. 148)		21,000		State Highway Agency	Spot	Intersections	
W-5601EC	Intersection traffic control	Modify control - two-way stop to roundabout	3	Intersections	$1057500	$1175000	HSIP (23 U.S.C. 148)		5,800		State Highway Agency	Spot	Intersections	
W-5601ED	Intersection traffic control	Intersection traffic control - other	1	Intersections	$27000	$30000	HSIP (23 U.S.C. 148)		7,000		State Highway Agency	Spot	Intersections	
W-5601EE	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$333000	$370000	HSIP (23 U.S.C. 148)		10,750		State Highway Agency	Spot	Intersections	
W-5601EF	Access management	Change in access - close or restrict existing access	1	Access points	$32400	$36000	HSIP (23 U.S.C. 148)		31,000		State Highway Agency	Spot	Intersections	
W-5601EG	Intersection geometry	Auxiliary lanes - extend existing left-turn lane	1	Intersections	$218000	$242222	HSIP (23 U.S.C. 148)		17,000		State Highway Agency	Spot	Intersections	
W-5601EI	Intersection geometry	Intersection geometrics - modify skew angle	1	Intersections	$40050	$44500	HSIP (23 U.S.C. 148)		7,500		State Highway Agency	Spot	Intersections	
W-5601EJ	Access management	Median crossover - directional crossover	0.284	Miles	$524700	$583000	HSIP (23 U.S.C. 148)		25,000		State Highway Agency	Spot	Intersections	
W-5601EK	Roadway	Roadway widening - add lane(s) along segment	0.38	Miles	$489600	$544000	HSIP (23 U.S.C. 148)		11,000		State Highway Agency	Spot	Lane Departure	
W-5601EN	Intersection traffic control	Modify traffic signal - add flashing yellow arrow	1	Approaches	$13500	$15000	HSIP (23 U.S.C. 148)		14,000		State Highway Agency	Spot	Intersections	
W-5601EO	Pedestrians and bicyclists	Install new crosswalk	4	Locations	$731250	$812500	HSIP (23 U.S.C. 148)		38,000		State Highway Agency	Spot	Pedestrians	
W-5601EP	Roadway	Roadway narrowing (road diet, roadway reconfiguration)	0.65	Miles	$288000	$320000	HSIP (23 U.S.C. 148)		12,000		State Highway Agency	Spot	Intersections	
W-5601EQ	Intersection traffic control	Modify traffic signal - add additional signal heads	1	Intersections	$31500	$35000	HSIP (23 U.S.C. 148)		21,000		State Highway Agency	Spot	Intersections	
W-5601ER	Intersection traffic control	Intersection flashers - add "when flashing" warning sign-mounted	1	Intersections	$25200	$28000	HSIP (23 U.S.C. 148)		2,600		State Highway Agency	Spot	Intersections	
W-5601EV	Access management	Median crossover - directional crossover	2.4	Miles	$180000	$200000	HSIP (23 U.S.C. 148)		13,000		State Highway Agency	Spot	Intersections	
W-5601EZ	Intersection traffic control	Intersection traffic control - other	1	Intersections	$44325	$49250	HSIP (23 U.S.C. 148)		20,706		State Highway Agency	Spot	Intersections	
W-5601F	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$104400	$116000	HSIP (23 U.S.C. 148)		21,000		State Highway Agency	Spot	Intersections	
W-5601FA	Intersection geometry	Intersection geometrics - modify skew angle	1	Intersections	$29250	$32500	HSIP (23 U.S.C. 148)		4,500		State Highway Agency	Spot	Intersections	

													RELATIONSHIP TO SHSP	
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
W-5601FB	Intersection traffic control	Intersection traffic control - other	1	Intersections	$112500	$125000	HSIP (23 U.S.C. 148)		30,000		State Highway Agency	Spot	Intersections	
W-5601FC	Intersection traffic control	Intersection traffic control - other	1	Intersections	$19800	$22000	HSIP (23 U.S.C. 148)		18,000		State Highway Agency	Spot	Intersections	
W-5601FD	Intersection geometry	Intersection geometrics - modify skew angle	1	Intersections	$166500	$185000	HSIP (23 U.S.C. 148)		23,000		State Highway Agency	Spot	Intersections	
W-5601FE	Intersection traffic control	Intersection traffic control - other	1	Intersections	$76500	$85000	HSIP (23 U.S.C. 148)		11,500		State Highway Agency	Spot	Intersections	
W-5601FF	Roadway	Superelevation / cross slope	0.97	Miles	$481500	$535000	HSIP (23 U.S.C. 148)		8,700		State Highway Agency	Spot	Lane Departure	
W-5601FG	Intersection traffic control	Intersection traffic control - other	1	Intersections	$66600	$74000	HSIP (23 U.S.C. 148)		10,800		State Highway Agency	Spot	Intersections	
W-5601FH	Roadway	Roadway widening - add lane(s) along segment	0.28	Miles	$534600	$594000	HSIP (23 U.S.C. 148)		10,000		State Highway Agency	Spot	Intersections	
W-5601FI	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$306000	$340000	HSIP (23 U.S.C. 148)		10,000		State Highway Agency	Spot	Intersections	
W-5601FJ	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$18000	$20000	HSIP (23 U.S.C. 148)		21,900		State Highway Agency	Spot	Intersections	
W-5601FM	Roadside	Barrier- metal	0.74	Miles	$180000	$200000	HSIP (23 U.S.C. 148)		3,300		State Highway Agency	Spot	Lane Departure	
W-5601FP	Roadside	Barrier end treatments (crash cushions, terminals)	102	Numbers	$225000	$250000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5601FR	Roadside	Removal of roadside objects (trees, poles, etc.)	1	Locations	$11700	$13000	HSIP (23 U.S.C. 148)		2,000		State Highway Agency	Spot	Intersections	
W-5601FU	Intersection traffic control	Systemic improvements - signal-controlled	1	Numbers	$225900	$251000	HSIP (23 U.S.C. 148)		5,300		State Highway Agency	Spot	Intersections	
W-5601FV	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$45000	$50000	HSIP (23 U.S.C. 148)		6,200		State Highway Agency	Spot	Intersections	
W-5601FX	Roadway	Roadway widening - travel lanes	2.68	Miles	$360900	$401000	HSIP (23 U.S.C. 148)		2,800		State Highway Agency	Spot	Lane Departure	
W-5601FY	Pedestrians and bicyclists	Install new crosswalk	1	Locations	$196200	$218000	HSIP (23 U.S.C. 148)		33,000		State Highway Agency	Spot	Pedestrians	
W-5601G	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$1125000	$1250000	HSIP (23 U.S.C. 148)		22,000		State Highway Agency	Spot	Intersections	
W-5601GD	Intersection traffic control	Modify traffic signal - add additional signal heads	1	Intersections	$36000	$40000	HSIP (23 U.S.C. 148)		3,800		State Highway Agency	Spot	Intersections	
W-5601GE	Intersection geometry	Auxiliary lanes - add auxiliary through lane	1	Approaches	$432000	$480000	HSIP (23 U.S.C. 148)		13,000		State Highway Agency	Spot	Intersections	
W-5601GG	Pedestrians and bicyclists	Miscellaneous pedestrians and bicyclists	3	Locations	$56700	$63000	HSIP (23 U.S.C. 148)		22,000		State Highway Agency	Spot	Pedestrians	
W-5601GH	Roadway signs and traffic control	Roadway signs (including post) - new or updated	1	Signs	$292500	$325000	HSIP (23 U.S.C. 148)		1,100		State Highway Agency	Spot	Lane Departure	

													RELATIONSHIP TO SHSP	
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
W-5601GI	Intersection traffic control	Systemic improvements - signal-controlled	1	Intersections	$119700	$133000	HSIP (23 U.S.C. 148)		20,178		State Highway Agency	Spot	Intersections	
W-5601GJ	Roadside	Barrier - other	1.6	Miles	$90000	$100000	HSIP (23 U.S.C. 148)		7,500		State Highway Agency	Spot	Lane Departure	
W-5601GK	Roadway	Rumble strips - edge or shoulder	4.71	Miles	$787500	$875000	HSIP (23 U.S.C. 148)		4,800		State Highway Agency	Spot	Lane Departure	
W-5601GL	Intersection traffic control	Intersection traffic control - other	1	Intersections	$86040	$95600	HSIP (23 U.S.C. 148)		5,200		State Highway Agency	Spot	Intersections	
W-5601GN	Intersection traffic control	Intersection traffic control - other	1	Intersections	$63000	$70000	HSIP (23 U.S.C. 148)		6,800		State Highway Agency	Spot	Intersections	
W-5601GP	Roadside	Roadside grading	0.35	Miles	$58500	$65000	HSIP (23 U.S.C. 148)		2,400		State Highway Agency	Spot	Lane Departure	
W-5601GQ	Roadway delineation	Longitudinal pavement markings - remarking	1	Miles	$153000	$170000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5601GU	Roadway delineation	Longitudinal pavement markings - remarking	1	Miles	$432000	$480000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5601GZ	Roadway delineation	Longitudinal pavement markings - remarking	39	Miles	$648000	$720000	HSIP (23 U.S.C. 148)		34,000		State Highway Agency	Systemic	Lane Departure	
W-5601HD	Intersection traffic control	Pavement markings - miscellaneous/other/unspecified	1	Approaches	$3983	$4425	HSIP (23 U.S.C. 148)		14,000		State Highway Agency	Spot	Intersections	
W-5601HH	Intersection traffic control	Modify traffic signal - replace existing indications (incandescent-to-LED and/or 8-to-12 inch dia.)	1	Intersections	$6300	$7000	HSIP (23 U.S.C. 148)		5,200		State Highway Agency	Spot	Intersections	
W-5601HJ	Roadway delineation	Longitudinal pavement markings - remarking	1	Miles	$1332000	$1480000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5601HK	Intersection traffic control	Intersection flashers - add "when flashing" warning sign-mounted	1	Intersections	$45900	$51000	HSIP (23 U.S.C. 148)		1,200		State Highway Agency	Spot	Intersections	
W-5601HL	Intersection traffic control	Intersection flashers - add "when flashing" warning sign-mounted	1	Intersections	$45000	$50000	HSIP (23 U.S.C. 148)		3,500		State Highway Agency	Spot	Intersections	
W-5601HM	Intersection traffic control	Intersection flashers - add "when flashing" warning sign-mounted	1	Intersections	$49500	$55000	HSIP (23 U.S.C. 148)		4,200		State Highway Agency	Spot	Intersections	
W-5601HQ	Intersection geometry	Auxiliary lanes - add right-turn lane	1	Intersections	$31500	$35000	HSIP (23 U.S.C. 148)		11,000		State Highway Agency	Spot	Intersections	
W-5601HR	Pedestrians and bicyclists	Medians and pedestrian refuge areas	1	Locations	$86400	$96000	HSIP (23 U.S.C. 148)		7,600		State Highway Agency	Spot	Pedestrians	
W-5601HS	Roadway delineation	Raised pavement markers	229	Miles	$99000	$110000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5601HT	Intersection traffic control	Intersection traffic control - other	1	Intersections	$117000	$130000	HSIP (23 U.S.C. 148)		6,650		State Highway Agency	Spot	Intersections	

													RELATIONSHIP TO SHSP	
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
W-5601HU	Intersection traffic control	Modify traffic signal - add additional signal heads	1	Intersections	$47070	$52300	HSIP (23 U.S.C. 148)		22,000		State Highway Agency	Spot	Intersections	
W-5601HV	Alignment	Horizontal curve realignment	0.4	Miles	$946800	$1052000	HSIP (23 U.S.C. 148)		1,500		State Highway Agency	Spot	Lane Departure	
W-5601HW	Roadway	Superelevation / cross slope	1	Curves	$18000	$20000	HSIP (23 U.S.C. 148)		2,200		State Highway Agency	Spot	Lane Departure	
W-5601HX	Intersection traffic control	Modify traffic signal - add flashing yellow arrow	4	Approaches	$90000	$100000	HSIP (23 U.S.C. 148)		22,000		State Highway Agency	Spot	Intersections	
W-5601HY	Intersection traffic control	Modify traffic signal - add flashing yellow arrow	4	Approaches	$49500	$55000	HSIP (23 U.S.C. 148)		35,000		State Highway Agency	Spot	Intersections	
W-5601HZ	Roadside	Barrier end treatments (crash cushions, terminals)	100	Numbers	$243000	$270000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5601I	Intersection geometry	Intersection geometrics - modify skew angle	1	Intersections	$18517	$20574	HSIP (23 U.S.C. 148)		12,000		State Highway Agency	Spot	Lane Departure	
W-5601IA	Roadway delineation	Longitudinal pavement markings - remarking	34.25	Miles	$298800	$332000	HSIP (23 U.S.C. 148)		15,000		State Highway Agency	Systemic	Lane Departure	
W-5601IB	Roadway delineation	Longitudinal pavement markings - remarking	16.13	Miles	$282600	$314000	HSIP (23 U.S.C. 148)		15,000		State Highway Agency	Systemic	Lane Departure	
W-5601IC	Roadside	Barrier end treatments (crash cushions, terminals)	100	Numbers	$216000	$240000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5601ID	Roadside	Barrier end treatments (crash cushions, terminals)	100	Numbers	$214200	$238000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5601IE	Roadway delineation	Longitudinal pavement markings - remarking	364	Miles	$526500	$585000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5601IF	Roadside	Barrier end treatments (crash cushions, terminals)	216	Numbers	$450000	$500000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5601IG	Roadside	Barrier end treatments (crash cushions, terminals)	144	Numbers	$370485	$411650	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5601IH	Roadway delineation	Longitudinal pavement markings - remarking	28.3	Miles	$451620	$501800	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5601IJ	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$54000	$60000	HSIP (23 U.S.C. 148)		10,000		State Highway Agency	Spot	Intersections	
W-5601IK	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$9000	$10000	HSIP (23 U.S.C. 148)		35,000		State Highway Agency	Spot	Intersections	
W-5601IL	Roadway delineation	Roadway delineation - other	1	Miles	$96390	$107100	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5601IM	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$405000	$450000	HSIP (23 U.S.C. 148)		14,000		State Highway Agency	Spot	Intersections	
W-5601IN	Access management	Median crossover - directional crossover	0.58	Miles	$63000	$70000	HSIP (23 U.S.C. 148)		22,000		State Highway Agency	Spot	Intersections	
W-5601U	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$135000	$150000	HSIP (23 U.S.C. 148)		15,000		State Highway Agency	Spot	Intersections	

													RELATIONSHIP TO SHSP	
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
W-5601Z	Access management	Median crossover - directional crossover	1	Crossovers	$457200	$508000	HSIP (23 U.S.C. 148)		23,000		State Highway Agency	Spot	Intersections	
W-5700	Intersection traffic control	Modify traffic signal - miscellaneous/other/unspecified	1	Intersections	$1800000	$2000000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Intersections	
W-5702A	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$409140	$454600	HSIP (23 U.S.C. 148)		6,050		State Highway Agency	Spot	Intersections	
W-5702B	Roadside	Barrier- metal	0.12	Miles	$54630	$60700	HSIP (23 U.S.C. 148)		4,700		State Highway Agency	Spot	Lane Departure	
W-5702D	Roadside	Barrier- metal	1	Miles	$67500	$75000	HSIP (23 U.S.C. 148)		4,000		State Highway Agency	Spot	Lane Departure	
W-5702E	Intersection traffic control	Intersection flashers - add "when flashing" warning sign-mounted	3	Intersections	$54000	$60000	HSIP (23 U.S.C. 148)		28,000		State Highway Agency	Spot	Intersections	
W-5702F	Access management	Median crossover - directional crossover	1	Crossovers	$45000	$50000	HSIP (23 U.S.C. 148)		9,500		State Highway Agency	Spot	Intersections	
W-5702G	Access management	Raised island - install new	0.8	Miles	$67500	$75000	HSIP (23 U.S.C. 148)		12,000		State Highway Agency	Spot	Intersections	
W-5702H	Access management	Raised island - install new	0.8	Miles	$90000	$100000	HSIP (23 U.S.C. 148)		27,000		State Highway Agency	Spot	Intersections	
W-5703A	Intersection traffic control	Intersection traffic control - other	1	Intersections	$19687	$21874	HSIP (23 U.S.C. 148)		38,000		State Highway Agency	Spot	Intersections	
W-5703B	Roadway delineation	Improve retroreflectivity	4.564	Miles	$22500	$25000	HSIP (23 U.S.C. 148)		16,000		State Highway Agency	Systemic	Lane Departure	
W-5703C	Pedestrians and bicyclists	Install sidewalk	0.76	Miles	$414000	$460000	HSIP (23 U.S.C. 148)		29,000		State Highway Agency	Spot	Pedestrians	
W-5703D	Access management	Median crossover - directional crossover	2	Crossovers	$144360	$160400	HSIP (23 U.S.C. 148)		35,000		State Highway Agency	Spot	Intersections	
W-5703E	Pedestrians and bicyclists	Install sidewalk	0.14	Miles	$4725	$5250	HSIP (23 U.S.C. 148)		51,000		State Highway Agency	Spot	Pedestrians	
W-5703F	Pedestrians and bicyclists	Install new crosswalk	1	Locations	$15750	$17500	HSIP (23 U.S.C. 148)		46,000		State Highway Agency	Spot	Pedestrians	
W-5703G	Intersection geometry	Auxiliary lanes - modify left-turn lane offset	1	Intersections	$140625	$156250	HSIP (23 U.S.C. 148)		37,000		State Highway Agency	Spot	Intersections	
W-5704A	Access management	Median crossover - close crossover	0.88	Miles	$90000	$100000	HSIP (23 U.S.C. 148)		36,000		State Highway Agency	Spot	Intersections	
W-5704B	Access management	Median crossover - directional crossover	2	Crossovers	$67500	$75000	HSIP (23 U.S.C. 148)		33,000		State Highway Agency	Spot	Intersections	
W-5704C	Intersection traffic control	Modify traffic signal - add additional signal heads	1	Intersections	$3600	$4000	HSIP (23 U.S.C. 148)		10,000		State Highway Agency	Spot	Intersections	
W-5704D	Roadway delineation	Longitudinal pavement markings - new	14.7	Miles	$2250	$2500	HSIP (23 U.S.C. 148)		2,300		State Highway Agency	Spot	Lane Departure	

													RELATIONSHIP TO SHSP	
PROJECT NAME	**IMPROVEMENT CATEGORY**	**SUBCATEGORY**	**OUTPUTS**	**OUTPUT TYPE**	**HSIP PROJECT COST($)**	**TOTAL PROJECT COST($)**	**FUNDING CATEGORY**	**FUNCTIONAL CLASSIFICATION**	**AADT**	**SPEED**	**OWNERSHIP**	**METHOD FOR SITE SELECTION**	**EMPHASIS AREA**	**STRATEGY**
W-5705A	Roadway delineation	Longitudinal pavement markings - remarking	1	Miles	$657000	$730000	HSIP (23 U.S.C. 148)		170,000		State Highway Agency	Systemic	Lane Departure	
W-5705B	Intersection traffic control	Modify traffic signal - add flashing yellow arrow	4	Approaches	$2700	$3000	HSIP (23 U.S.C. 148)		44,000		State Highway Agency	Spot	Intersections	
W-5705C	Lighting	Intersection lighting	4	Intersections	$9000	$10000	HSIP (23 U.S.C. 148)		20,000		State Highway Agency	Spot	Intersections	
W-5705D	Intersection traffic control	Modify traffic signal - add flashing yellow arrow	4	Approaches	$36000	$40000	HSIP (23 U.S.C. 148)		19,000		State Highway Agency	Spot	Intersections	
W-5705E	Intersection geometry	Auxiliary lanes - add right-turn lane	1	Intersections	$63900	$71000	HSIP (23 U.S.C. 148)		11,000		State Highway Agency	Spot	Intersections	
W-5705F	Roadway	Pavement surface - high friction surface	1	Locations	$27000	$30000	HSIP (23 U.S.C. 148)		15,000		State Highway Agency	Spot	Lane Departure	
W-5705G	Intersection geometry	Intersection geometrics - modify skew angle	1	Intersections	$54000	$60000	HSIP (23 U.S.C. 148)		9,100		State Highway Agency	Spot	Intersections	
W-5705H	Alignment	Horizontal curve realignment	0.2	Miles	$135000	$150000	HSIP (23 U.S.C. 148)		2,100		State Highway Agency	Spot	Lane Departure	
W-5705I	Intersection traffic control	Intersection traffic control - other	1	Intersections	$4500	$5000	HSIP (23 U.S.C. 148)		20,000		State Highway Agency	Spot	Intersections	
W-5705J	Pedestrians and bicyclists	Pedestrian signal - install new at intersection	2	Intersections	$5400	$6000	HSIP (23 U.S.C. 148)		35,000		State Highway Agency	Spot	Pedestrians	
W-5705K	Pedestrians and bicyclists	Pedestrian signal - Pedestrian Hybrid Beacon	2	Locations	$6750	$7500	HSIP (23 U.S.C. 148)		12,000		State Highway Agency	Spot	Pedestrians	
W-5705L	Intersection traffic control	Modify traffic signal - add flashing yellow arrow	4	Approaches	$2700	$3000	HSIP (23 U.S.C. 148)		17,000		State Highway Agency	Spot	Intersections	
W-5706A	Access management	Raised island - install new	0.9	Miles	$270000	$300000	HSIP (23 U.S.C. 148)		38,600		State Highway Agency	Spot	Intersections	
W-5706B	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Approaches	$134000	$148888	HSIP (23 U.S.C. 148)		8,700		State Highway Agency	Spot	Intersections	
W-5706C	Intersection traffic control	Modify control - modifications to roundabout	1	Intersections	$450000	$500000	HSIP (23 U.S.C. 148)		5,000		State Highway Agency	Spot	Intersections	
W-5706D	Intersection traffic control	Intersection traffic control - other	1	Intersections	$90000	$100000	HSIP (23 U.S.C. 148)		35,000		State Highway Agency	Spot	Intersections	
W-5706E	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$45000	$50000	HSIP (23 U.S.C. 148)		7,900		State Highway Agency	Spot	Intersections	
W-5706F	Pedestrians and bicyclists	Install new crosswalk	1	Locations	$13500	$15000	HSIP (23 U.S.C. 148)		27,000		State Highway Agency	Spot	Pedestrians	
W-5707A	Pedestrians and bicyclists	Pedestrian signal - audible device	4	Locations	$81000	$90000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Spot	Pedestrians	
W-5707B	Intersection traffic control	Intersection traffic control - other	1	Intersections	$4500	$5000	HSIP (23 U.S.C. 148)		6,200		State Highway Agency	Spot	Intersections	
W-5707C	Roadway delineation	Longitudinal pavement markings - remarking	1.89	Miles	$4500	$5000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	

													RELATIONSHIP TO SHSP	
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
W-5707D	Roadway	Roadway widening - curve	1	Curves	$90000	$100000	HSIP (23 U.S.C. 148)		2,800		State Highway Agency	Spot	Lane Departure	
W-5707E	Intersection traffic control	Intersection traffic control - other	1	Intersections	$9000	$10000	HSIP (23 U.S.C. 148)		9,000		State Highway Agency	Spot	Intersections	
W-5707F	Intersection traffic control	Modify traffic signal timing - left-turn phasing (permissive to protected/permissive)	1	Approaches	$2700	$3000	HSIP (23 U.S.C. 148)		6,500		State Highway Agency	Spot	Intersections	
W-5708A	Intersection traffic control	Modify control - two-way stop to roundabout	1	Intersections	$175500	$195000	HSIP (23 U.S.C. 148)		4,700		State Highway Agency	Spot	Intersections	
W-5708B	Access management	Median crossover - directional crossover	0.3	Miles	$83500	$92777	HSIP (23 U.S.C. 148)		14,000		State Highway Agency	Spot	Intersections	
W-5708C	Alignment	Horizontal curve realignment	0.15	Miles	$22500	$25000	HSIP (23 U.S.C. 148)		1,400		State Highway Agency	Spot	Lane Departure	
W-5708D	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Intersections	$27000	$30000	HSIP (23 U.S.C. 148)		6,700		State Highway Agency	Spot	Intersections	
W-5709A	Interchange design	Interchange design - other	1	Interchanges	$121500	$135000	HSIP (23 U.S.C. 148)		51,000		State Highway Agency	Spot	Intersections	
W-5709B	Roadway	Superelevation / cross slope	1	Curves	$9000	$10000	HSIP (23 U.S.C. 148)		2,200		State Highway Agency	Spot	Lane Departure	
W-5709C	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Approaches	$45000	$50000	HSIP (23 U.S.C. 148)		8,400		State Highway Agency	Spot	Intersections	
W-5710A	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Approaches	$31500	$35000	HSIP (23 U.S.C. 148)		12,000		State Highway Agency	Spot	Intersections	
W-5710B	Access management	Median crossover - directional crossover	3	Crossovers	$1071000	$1190000	HSIP (23 U.S.C. 148)		27,000		State Highway Agency	Spot	Intersections	
W-5710C	Access management	Raised island - install new	2.5	Miles	$45000	$50000	HSIP (23 U.S.C. 148)		8,900		State Highway Agency	Spot	Intersections	
W-5710D	Access management	Median crossover - directional crossover	1	Crossovers	$54000	$60000	HSIP (23 U.S.C. 148)		13,000		State Highway Agency	Spot	Intersections	
W-5710E	Access management	Median crossover - directional crossover	2	Crossovers	$58500	$65000	HSIP (23 U.S.C. 148)		17,000		State Highway Agency	Spot	Intersections	
W-5710F	Intersection traffic control	Intersection traffic control - other	1	Intersections	$9000	$10000	HSIP (23 U.S.C. 148)		15,000		State Highway Agency	Spot	Intersections	
W-5710G	Roadway	Rumble strips - edge or shoulder	7.89	Miles	$90000	$100000	HSIP (23 U.S.C. 148)		7,500		State Highway Agency	Spot	Lane Departure	
W-5710H	Intersection traffic control	Modify control - two-way stop to roundabout	1	Intersections	$67500	$75000	HSIP (23 U.S.C. 148)		9,000		State Highway Agency	Spot	Intersections	
W-5710I	Intersection traffic control	Modify control - traffic signal to roundabout	1	Intersections	$85500	$95000	HSIP (23 U.S.C. 148)		4,900		State Highway Agency	Spot	Intersections	
W-5710J	Intersection traffic control	Modify control - two-way stop to roundabout	1	Intersections	$67500	$75000	HSIP (23 U.S.C. 148)		10,000		State Highway Agency	Spot	Intersections	

													RELATIONSHIP TO SHSP	
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
W-5710K	Intersection traffic control	Modify control - two-way stop to roundabout	1	Intersections	$67500	$75000	HSIP (23 U.S.C. 148)		3,900		State Highway Agency	Spot	Intersections	
W-5710L	Intersection traffic control	Intersection traffic control - other	1	Intersections	$45000	$50000	Penalty Funds (23 U.S.C. 164)		20,000		State Highway Agency	Spot	Intersections	
W-5710M	Roadway	Rumble strips - edge or shoulder	2.34	Miles	$4500	$5000	HSIP (23 U.S.C. 148)		11,000		State Highway Agency	Systemic	Lane Departure	
W-5710N	Roadway	Rumble strips - edge or shoulder	16.3	Miles	$4500	$5000	HSIP (23 U.S.C. 148)		6,700		State Highway Agency	Systemic	Lane Departure	
W-5710O	Intersection geometry	Auxiliary lanes - add left-turn lane	2	Intersections	$22500	$25000	HSIP (23 U.S.C. 148)		18,000		State Highway Agency	Spot	Intersections	
W-5712A	Intersection traffic control	Modify control - two-way stop to roundabout	3	Intersections	$270000	$300000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Spot	Intersections	
W-5712B	Intersection traffic control	Intersection traffic control - other	1	Intersections	$67500	$75000	HSIP (23 U.S.C. 148)		4,700		State Highway Agency	Spot	Intersections	
W-5712C	Roadside	Barrier- metal	1	Miles	$193500	$215000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5712D	Roadside	Barrier- metal	1	Miles	$184500	$205000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5712E	Intersection traffic control	Modify traffic signal - add flashing yellow arrow	1	Approaches	$4500	$5000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Spot	Intersections	
W-5712F	Roadway delineation	Raised pavement markers	1	Miles	$346500	$385000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5712G	Roadway delineation	Longitudinal pavement markings - remarking	8.22	Miles	$310500	$345000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5713A	Intersection traffic control	Intersection flashers - add overhead (actuated)	1	Intersections	$36000	$40000	HSIP (23 U.S.C. 148)		11,300		State Highway Agency	Spot	Intersections	
W-5713B	Roadside	Barrier- metal	0.06	Miles	$10800	$12000	HSIP (23 U.S.C. 148)		7,200		State Highway Agency	Spot	Lane Departure	
W-5713C	Roadside	Barrier end treatments (crash cushions, terminals)	64	Numbers	$193500	$215000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5713D	Roadside	Barrier end treatments (crash cushions, terminals)	55	Numbers	$162900	$181000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5713E	Roadside	Barrier end treatments (crash cushions, terminals)	137	Numbers	$453600	$504000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5713F	Roadside	Barrier end treatments (crash cushions, terminals)	59	Numbers	$195300	$217000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5713G	Roadside	Barrier end treatments (crash cushions, terminals)	64	Numbers	$196200	$218000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5713H	Roadside	Barrier end treatments (crash cushions, terminals)	69	Numbers	$203400	$226000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	
W-5713I	Roadside	Barrier end treatments (crash cushions, terminals)	73	Numbers	$226800	$252000	HSIP (23 U.S.C. 148)		0		State Highway Agency	Systemic	Lane Departure	

2017 North Carolina Highway Safety Improvement Program

													RELATIONSHIP TO SHSP	
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	EMPHASIS AREA	STRATEGY
W-5713J	Roadway	Rumble strips - unspecified or other	28.28	Miles	$27000	$30000	HSIP (23 U.S.C. 148)		4,444		State Highway Agency	Spot	Lane Departure	
W-5713K	Roadway	Roadway widening - add lane(s) along segment	0.27	Miles	$1195267	$1328074	HSIP (23 U.S.C. 148)		43,000		State Highway Agency	Spot	Lane Departure	
W-5713L	Intersection geometry	Auxiliary lanes - add left-turn lane	2	Approaches	$45000	$50000	HSIP (23 U.S.C. 148)		11,000		State Highway Agency	Spot	Intersections	
W-5713M	Roadside	Barrier- metal	1.49	Miles	$9000	$10000	HSIP (23 U.S.C. 148)		5,100		State Highway Agency	Spot	Lane Departure	
W-5713N	Intersection geometry	Auxiliary lanes - add left-turn lane	1	Approaches	$9000	$10000	HSIP (23 U.S.C. 148)		9,500		State Highway Agency	Spot	Intersections	
W-5714A	Pedestrians and bicyclists	Pedestrian warning signs - add/modify flashers	1	Locations	$27000	$30000	HSIP (23 U.S.C. 148)		13,000		State Highway Agency	Spot	Pedestrians	
W-5714B	Intersection traffic control	Intersection traffic control - other	1	Intersections	$13500	$15000	HSIP (23 U.S.C. 148)		12,000		State Highway Agency	Spot	Intersections	
W-5714C	Roadside	Barrier- metal	0.59	Miles	$7200	$8000	HSIP (23 U.S.C. 148)		785		State Highway Agency	Spot	Lane Departure	
W-5714D	Roadside	Barrier- metal	0.59	Miles	$4200	$4666	HSIP (23 U.S.C. 148)		820		State Highway Agency	Spot	Lane Departure	
Z-5400BA	Railroad grade crossings	Railroad grade crossing gates	3	Locations	$36759	$40843	HSIP (23 U.S.C. 148)		0		State Highway Agency	Spot	Intersections	
Z-5400GP	Railroad grade crossings	Railroad grade crossing gates	1	Locations	$281700	$313000	HSIP (23 U.S.C. 148)		628		State Highway Agency	Spot	Intersections	
Z-5400GR	Railroad grade crossings	Railroad grade crossing gates	1	Locations	$405900	$451000	HSIP (23 U.S.C. 148)		1,865		State Highway Agency	Spot	Intersections	
Z-5400II	Railroad grade crossings	Railroad grade crossing gates	1	Locations	$384300	$427000	HSIP (23 U.S.C. 148)		4,723		State Highway Agency	Spot	Intersections	
Z-5400IJ	Railroad grade crossings	Upgrade railroad crossing signal	1	Locations	$254700	$283000	HSIP (23 U.S.C. 148)		339		State Highway Agency	Spot	Intersections	
Z-5400LF	Railroad grade crossings	Upgrade railroad crossing signal	1	Locations	$144000	$160000	HSIP (23 U.S.C. 148)		16,424		State Highway Agency	Spot	Intersections	
Z-P-3814C	Railroad grade crossings	Railroad grade crossing gates	1	Locations	$442883	$492092	HSIP (23 U.S.C. 148)		13,300		State Highway Agency	Spot	Intersections	

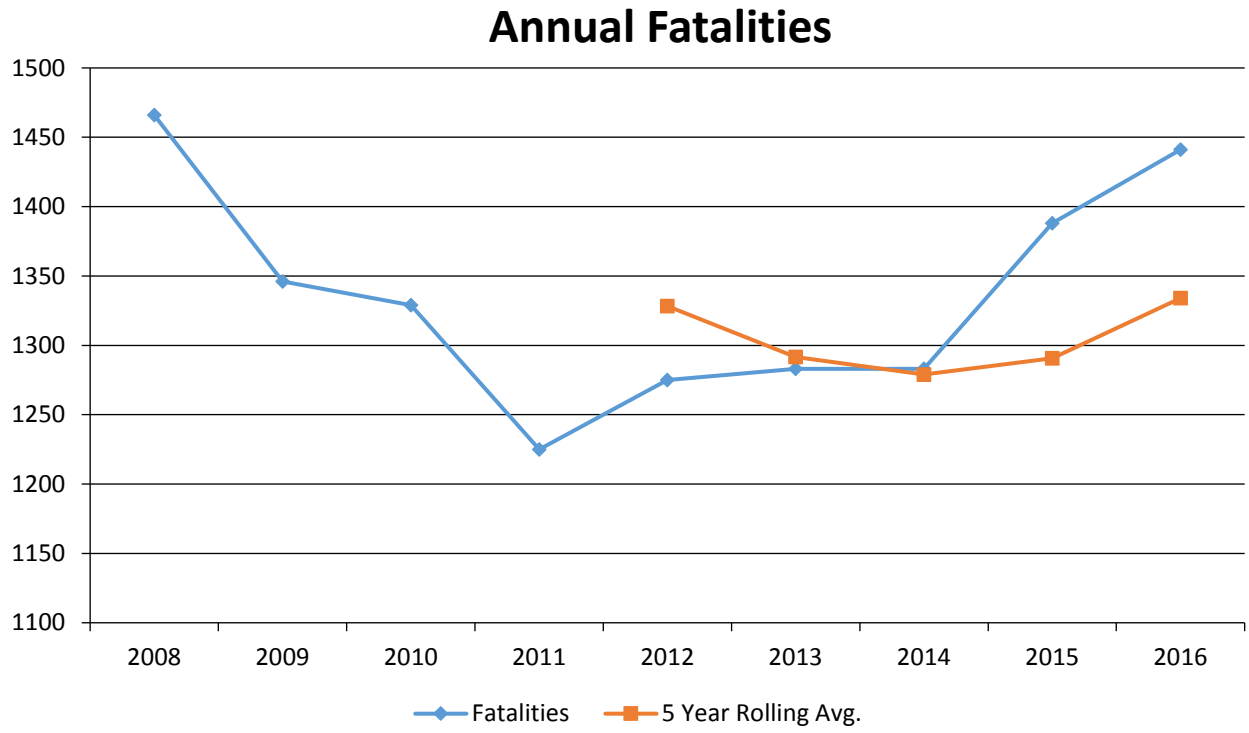
Enter additional comments here to clarify your response for this question or add supporting information.

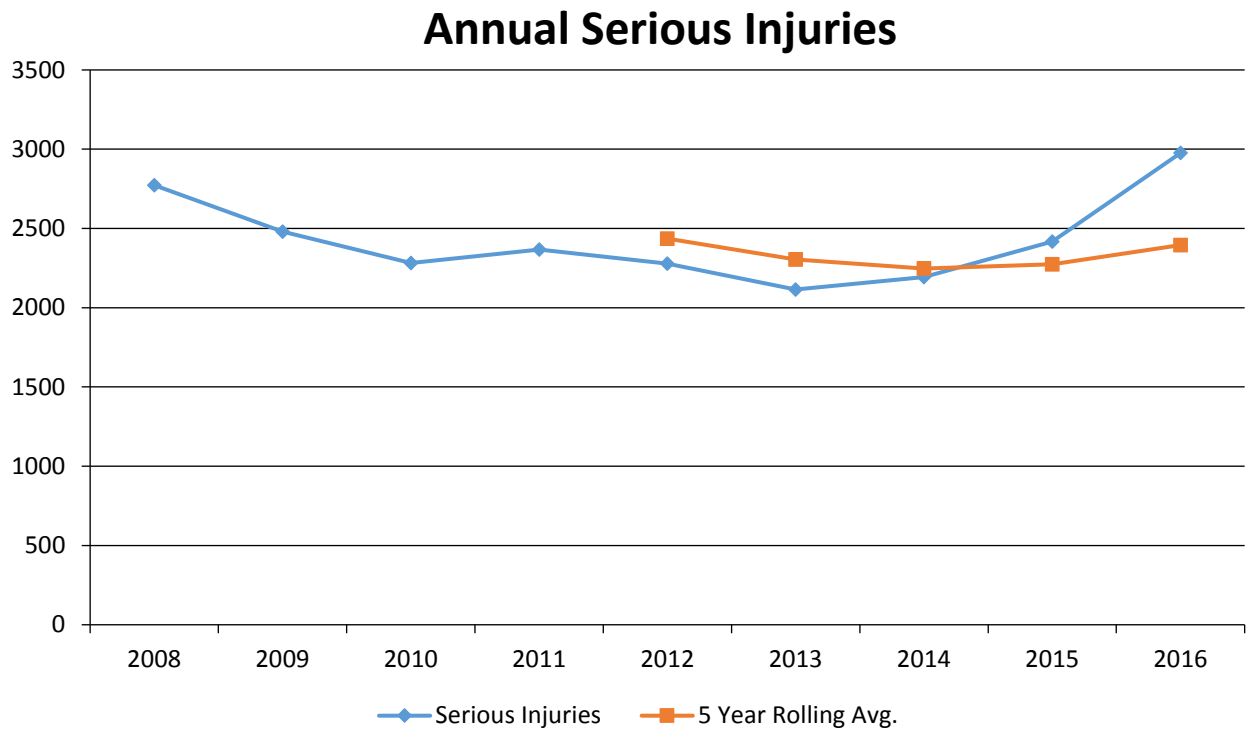
Safety Performance

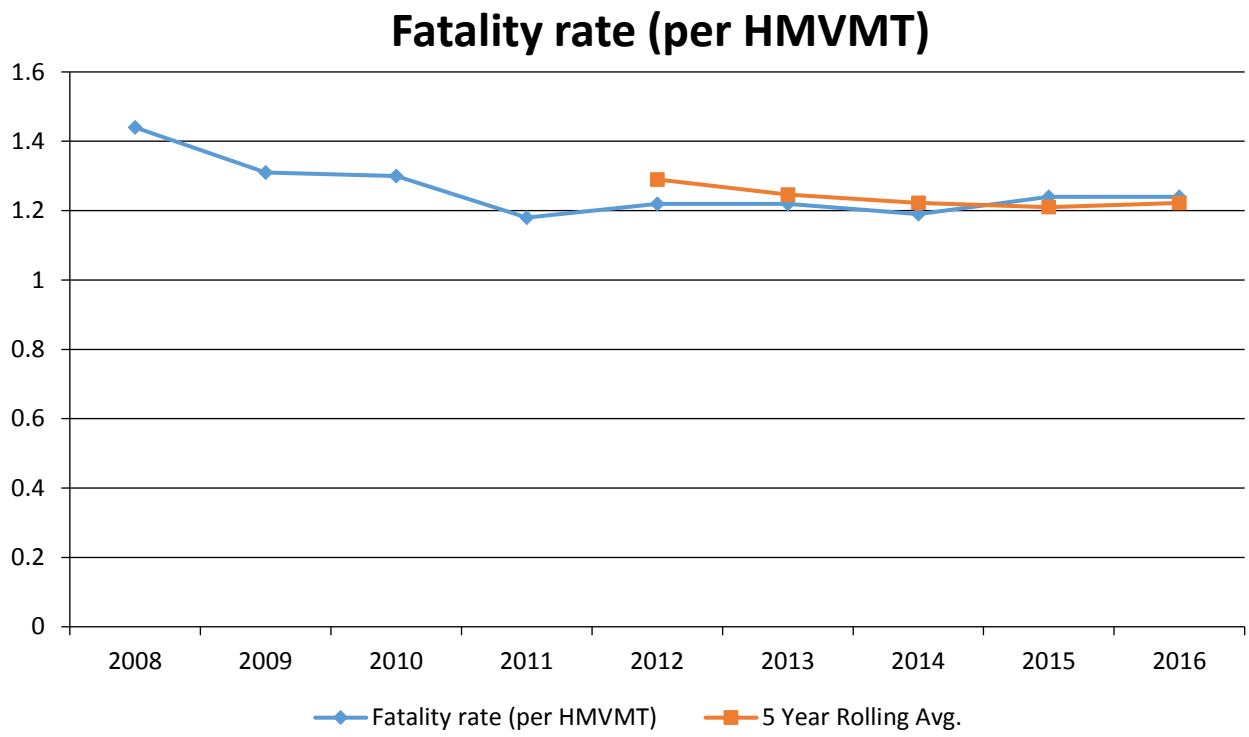
General Highway Safety Trends

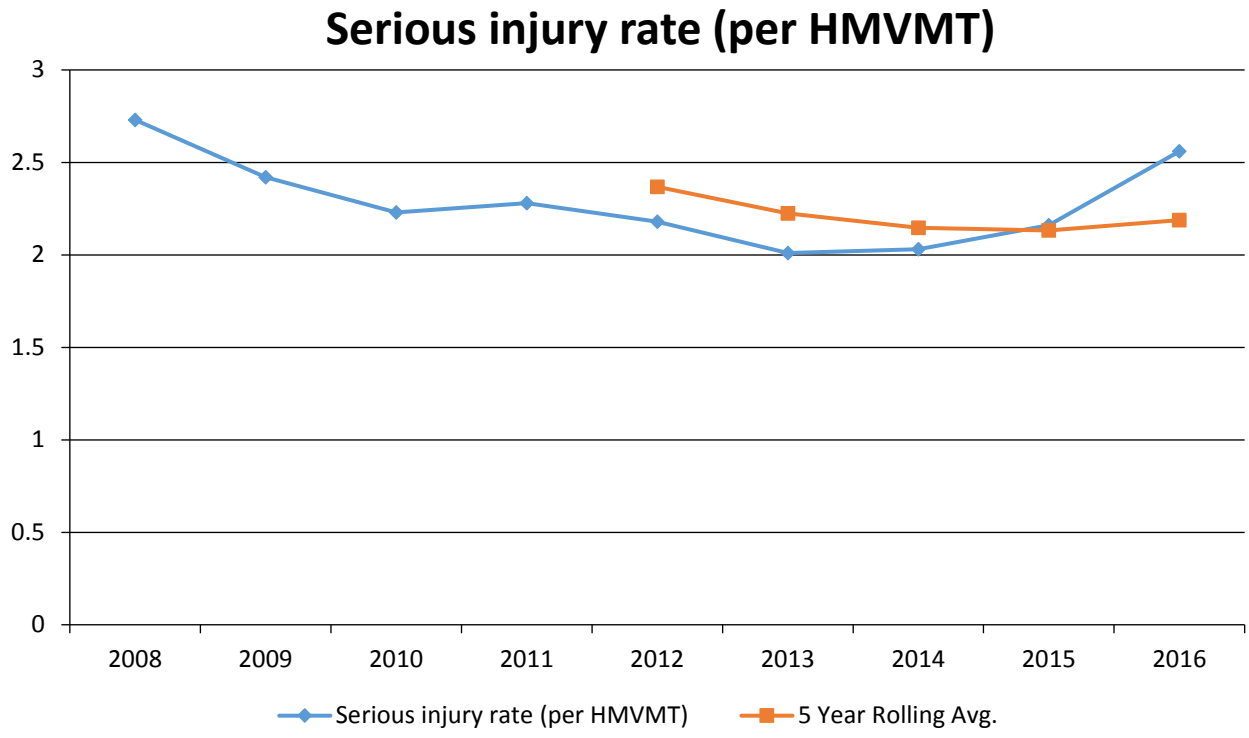
Present data showing the general highway safety trends in the State for the past five years.

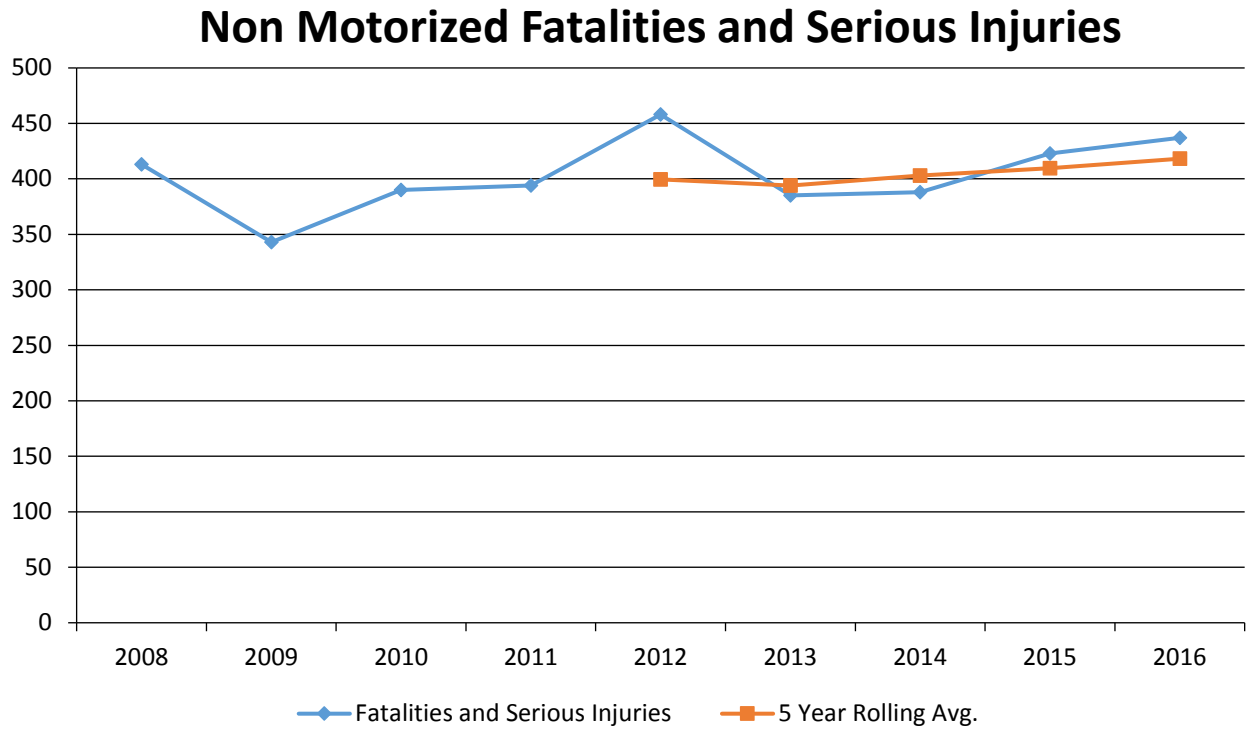
PERFORMANCE MEASURES	2008	2009	2010	2011	2012	2013	2014	2015	2016
Fatalities	1,466	1,346	1,329	1,225	1,275	1,283	1,283	1,388	1,441
Serious Injuries	2,773	2,480	2,283	2,366	2,278	2,115	2,194	2,417	2,976
Fatality rate (per HMVMT)	1.440	1.310	1.300	1.180	1.220	1.220	1.190	1.240	1.240
Serious injury rate (per HMVMT)	2.730	2.420	2.230	2.280	2.180	2.010	2.030	2.160	2.560
Number non-motorized fatalities	194	163	187	183	220	194	189	215	210
Number of non-motorized serious injuries	219	180	203	211	238	191	199	208	227


Annual Fatalities
1500
1450
1400
1350
1300
1250
1200
1150
1100
2008
2009
2010
2011
2012
2013
2014
2015
2016
Fatalities
5 Year Rolling Avg.


Annual Serious Injuries
3500
3000
2500
2000
1500
1000
500
0
2008
2009
2010
2011
2012
2013
2014
2015
2016
Serious Injuries
5 Year Rolling Avg.


Fatality rate (per HMVMT)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2008
2009
2010
2011
2012
2013
2014
2015
2016
Fatality rate (per HMVMT)
5 Year Rolling Avg.


Serious injury rate (per HMVMT)
3
2.5
2
1.5
1
0.5
0
2008
2009
2010
2011
2012
2013
2014
2015
2016
Serious injury rate (per HMVMT)
5 Year Rolling Avg.



Enter additional comments here to clarify your response for this question or add supporting information.

Describe fatality data source.

State Motor Vehicle Crash Database

Enter additional comments here to clarify your response for this question or add supporting information.

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

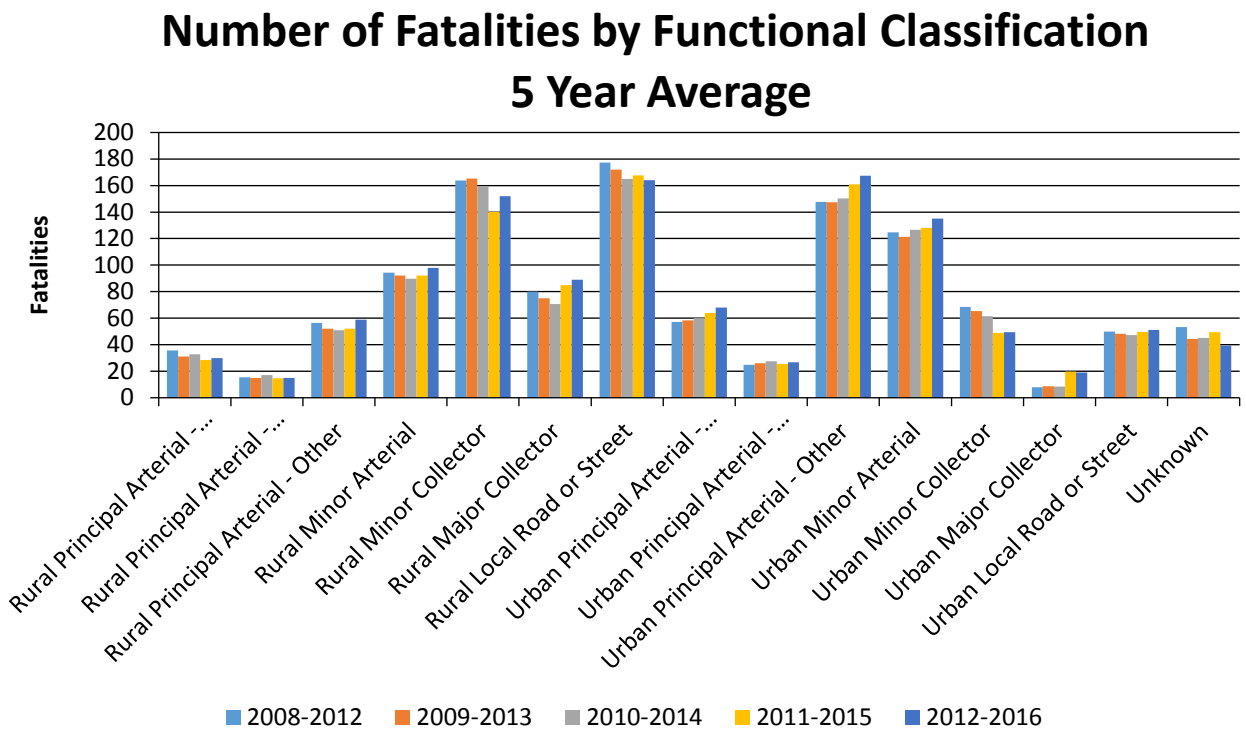
Year 2016

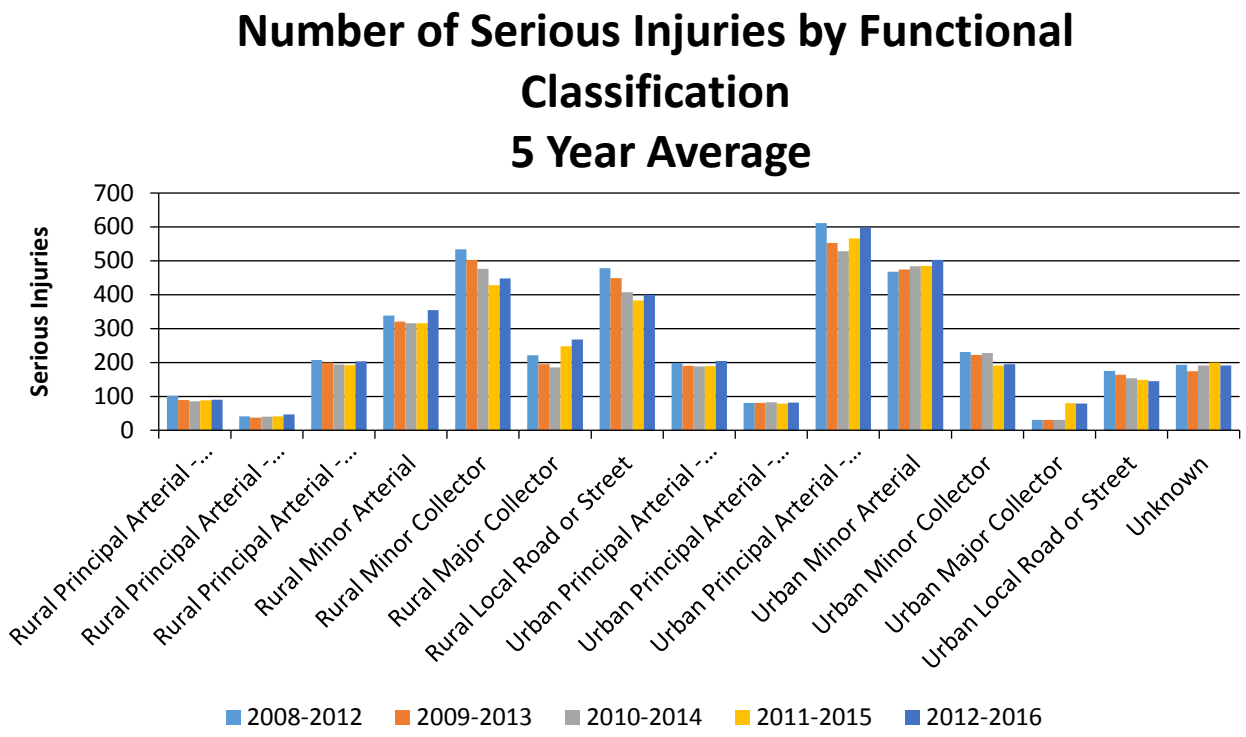
Functional Classification	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
Rural Principal Arterial - Interstate	29.8	90	0.49	1.49
Rural Principal Arterial - Other Freeways and Expressways	15	46.4	10.1	29.73
Rural Principal Arterial - Other	58.8	203.4	0.94	3.22
Rural Minor Arterial	98	354.8	1.74	6.3

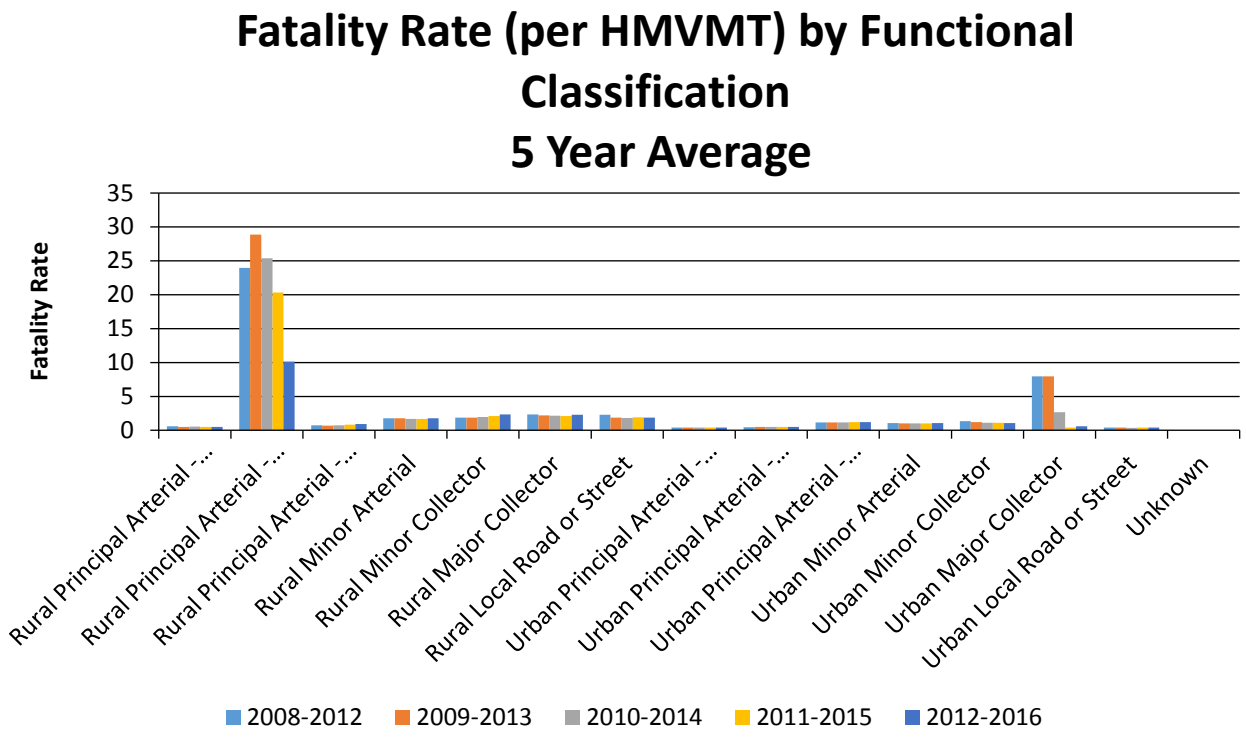
Functional Classification	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
Rural Minor Collector	152	447.6	2.35	6.9
Rural Major Collector	89	267.8	2.3	6.7
Rural Local Road or Street	164	399.8	1.87	4.57
Urban Principal Arterial - Interstate	68	204.8	0.39	1.18
Urban Principal Arterial - Other Freeways and Expressways	26.8	81.4	0.48	1.45
Urban Principal Arterial - Other	167.4	598	1.19	4.23
Urban Minor Arterial	135	503.2	1.04	3.87
Urban Minor Collector	49.4	195.2	1.06	4.22
Urban Major Collector	19	78.4	0.59	2.92
Urban Local Road or Street	51	145.2	0.37	1.07
Unknown	39.2	191	0	0

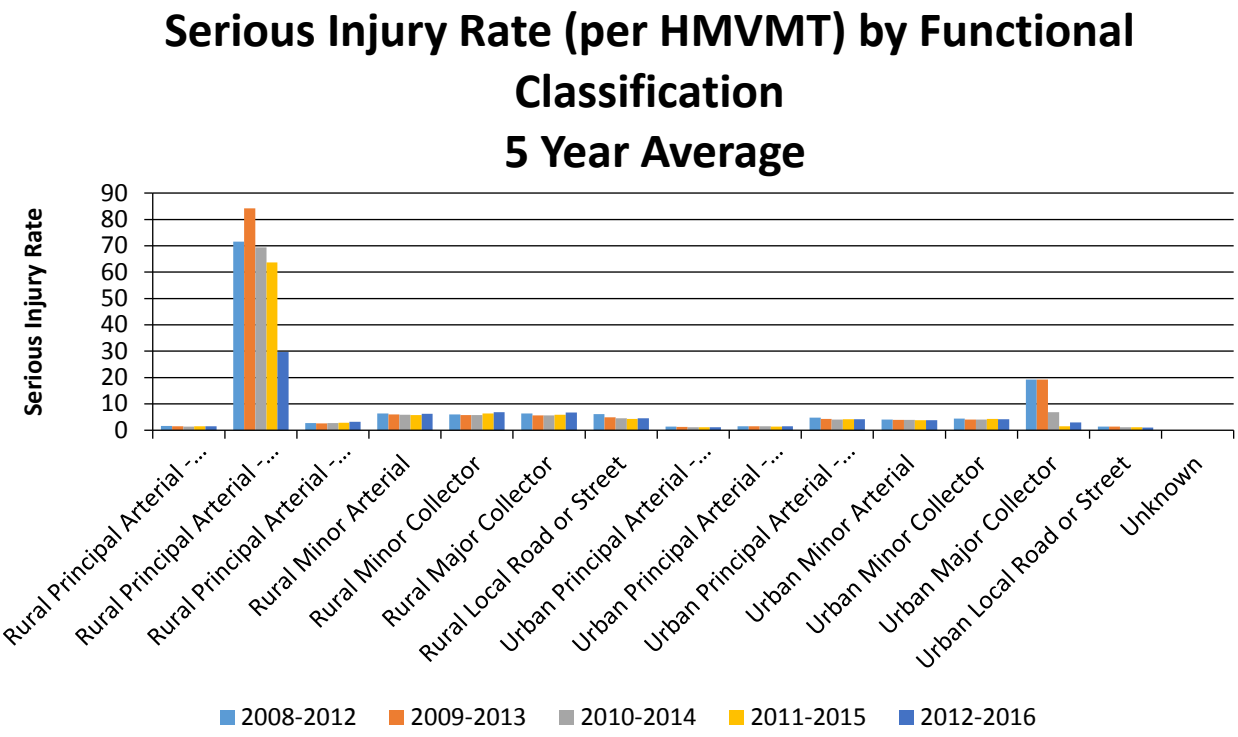
Year 2016

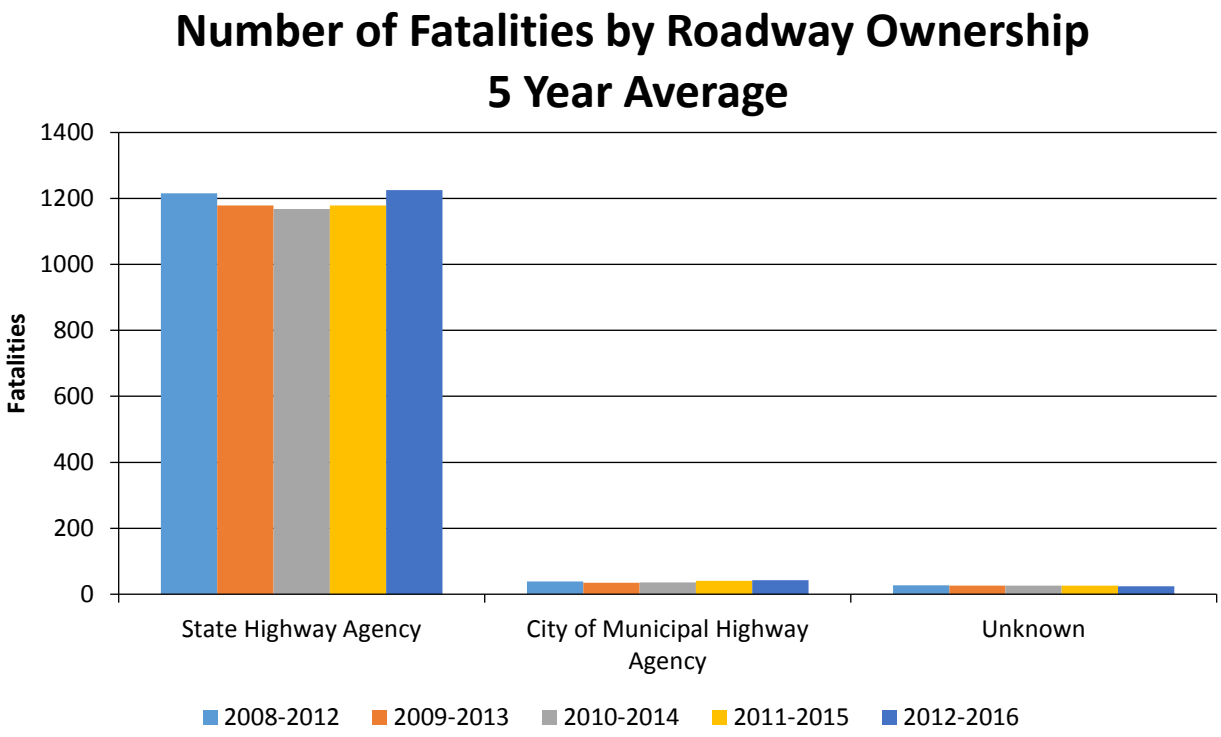
Roadways	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
State Highway Agency	1,224.8	4,037.8	1.17	3.85
County Highway Agency				
Town or Township Highway Agency				
City of Municipal Highway Agency	42.8	154.4	0.37	1.33
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				
Unknown	24.2	99.6		

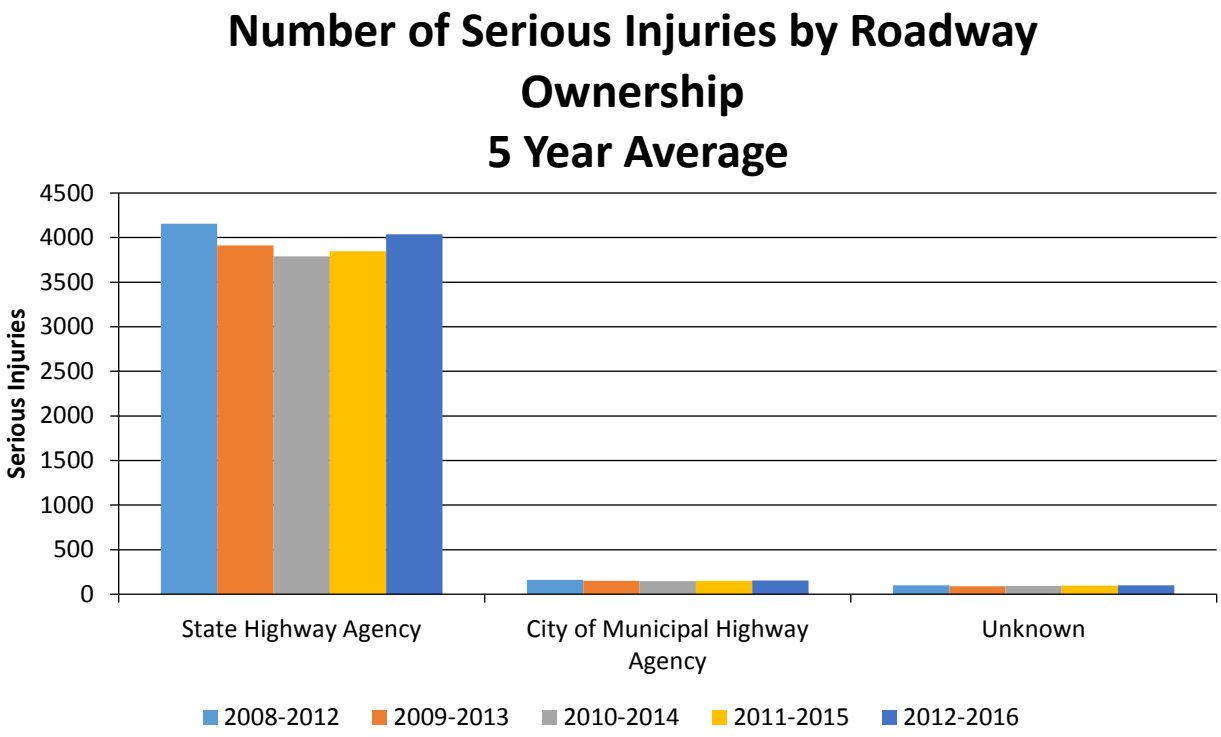

Number of Fatalities by Functional Classification
5 Year Average
Fatalities
200
180
160
140
120
100
80
60
40
20
0
Rural Principal Arterial -...
Rural Principal Arterial -...
Rural Principal Arterial - Other
Rural Minor Arterial
Rural Minor Collector
Rural Major Collector
Rural Local Road or Street
Urban Principal Arterial -...
Urban Principal Arterial -...
Urban Principal Arterial - Other
Urban Minor Arterial
Urban Minor Collector
Urban Major Collector
Urban Local Road or Street
Unknown
2008-2012
2009-2013
2010-2014
2011-2015
2012-2016

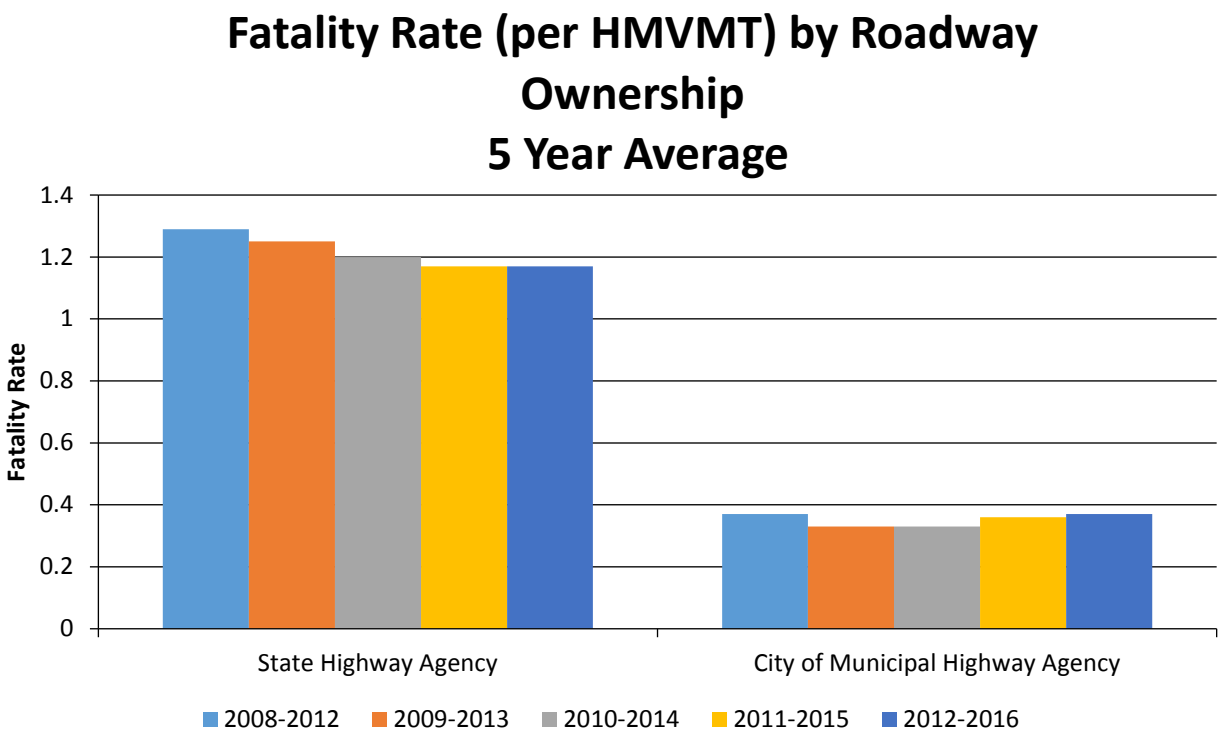

Number of Serious Injuries by Functional Classification
5 Year Average
Serious Injuries
700
600
500
400
300
200
100
0
Rural Principal Arterial -...
Rural Principal Arterial -...
Rural Principal Arterial -...
Rural Minor Arterial
Rural Minor Collector
Rural Major Collector
Rural Local Road or Street
Urban Principal Arterial -...
Urban Principal Arterial -...
Urban Principal Arterial -...
Urban Minor Arterial
Urban Minor Collector
Urban Major Collector
Urban Local Road or Street
Unknown
2008-2012
2009-2013
2010-2014
2011-2015
2012-2016

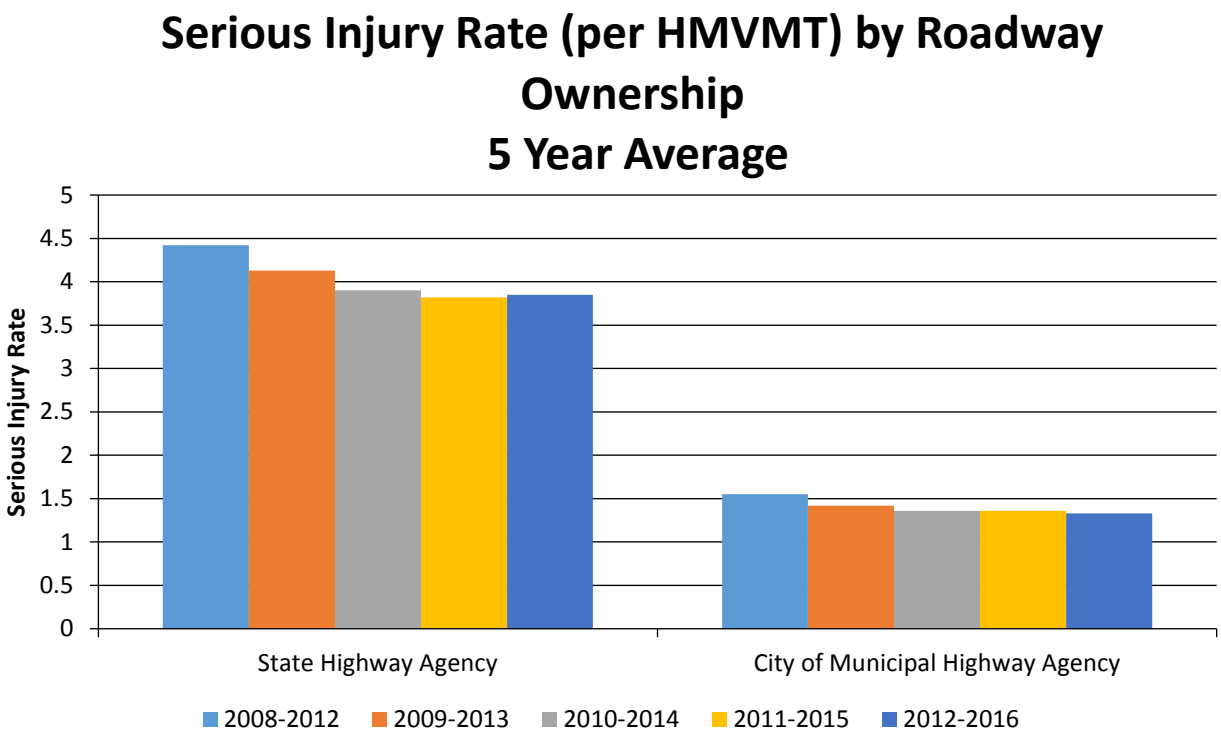

Fatality Rate (per HMVMT) by Functional Classification
5 Year Average
Fatality Rate
35
30
25
20
15
10
5
0
Rural Principal Arterial -...
Rural Principal Arterial -...
Rural Principal Arterial -...
Rural Minor Arterial
Rural Minor Collector
Rural Major Collector
Rural Local Road or Street
Urban Principal Arterial -...
Urban Principal Arterial -...
Urban Principal Arterial -...
Urban Minor Arterial
Urban Minor Collector
Urban Major Collector
Urban Local Road or Street
Unknown
2008-2012
2009-2013
2010-2014
2011-2015
2012-2016


Serious Injury Rate (per HMVMT) by Functional Classification
5 Year Average
Serious Injury Rate
90
80
70
60
50
40
30
20
10
0
Rural Principal Arterial -...
Rural Principal Arterial -...
Rural Principal Arterial -...
Rural Minor Arterial
Rural Minor Collector
Rural Major Collector
Rural Local Road or Street
Urban Principal Arterial -...
Urban Principal Arterial -...
Urban Principal Arterial -...
Urban Minor Arterial
Urban Minor Collector
Urban Major Collector
Urban Local Road or Street
Unknown
2008-2012
2009-2013
2010-2014
2011-2015
2012-2016


Number of Fatalities by Roadway Ownership
5 Year Average
Fatalities
1400
1200
1000
800
600
400
200
0
State Highway Agency
City of Municipal Highway Agency
Unknown
2008-2012
2009-2013
2010-2014
2011-2015
2012-2016


Number of Serious Injuries by Roadway Ownership
5 Year Average
Serious Injuries
4500
4000
3500
3000
2500
2000
1500
1000
500
0
State Highway Agency
City of Municipal Highway Agency
Unknown
2008-2012
2009-2013
2010-2014
2011-2015
2012-2016


Fatality Rate (per HMVMT) by Roadway Ownership
5 Year Average
Fatality Rate
1.4
1.2
1
0.8
0.6
0.4
0.2
0
State Highway Agency
City of Municipal Highway Agency
2008-2012
2009-2013
2010-2014
2011-2015
2012-2016



Enter additional comments here to clarify your response for this question or add supporting information.

Are there any other aspects of the general highway safety trends on which the State would like to elaborate?

Yes

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 2018 Targets *

Number of Fatalities 1207.3

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

For the 2018 Highway Safety Improvement Plan (HSIP), the goal is to reduce total fatalities by 5.10 percent each year from 1,340.6 (2012-2016 average) to 1,207.3 (2014-2018 average) by December 31, 2018. This target follows the goal of the North Carolina SHSP to cut the fatalities and serious injuries in half based on the 2013 figures before 2030.

Number of Serious Injuries 2161.2

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

For the 2018 Highway Safety Improvement Plan (HSIP), the goal is to reduce total serious injuries by 5.10 percent each year from 2,399.8 (2012-2016 average) to 2,161.2 (2014-2018 average) by December 31, 2018. This target follows the goal of the North Carolina SHSP to cut the fatalities and serious injuries in half based on the 2013 figures before 2030.

Fatality Rate 1.114

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

For the 2018 Highway Safety Improvement Plan (HSIP), the goal is to reduce the fatality rate by 4.75 percent each year from 1.228 (2012-2016 average) to 1.114 (2014-2018 average) by December 31, 2018. This target follows the goal of the North Carolina SHSP to cut the fatalities and serious injuries in half based on the 2013 figures before 2030.

Serious Injury Rate 1.988

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

For the 2018 Highway Safety Improvement Plan (HSIP), the goal is to reduce the serious injury rate by 4.75 percent each year from 2.191 (2012-2016 average) to 1.988 (2014-2018 average) by December 31, 2018. This target follows the goal of the North Carolina SHSP to cut the fatalities and serious injuries in half based on the 2013 figures before 2030.

Total Number of Non-Motorized Fatalities and Serious Injuries 438.8

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

For the 2018 Highway Safety Improvement Plan (HSIP), the goal is to reduce the total non-motorized fatalities and serious injuries by 5.30 percent each year from 438.8 (2012-2016 average) to 393.5 (2014-2018 average) by December 31, 2018. This target follows the goal of the North Carolina SHSP to cut the fatalities and serious injuries in half based on the 2013 figures before 2030.

Enter additional comments here to clarify your response for this question or add supporting information.

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. In addition, we had a Safety Target Setting Coordination Training Workshop in March 2017 with the MPO's where FHWA and NHTSA staff covered FHWA's Safety Performance Management Measures and NHTSA's Safety Performance Measure requirements and provided participants with an understanding of Federal safety performance requirements for carrying out the Highway Safety Improvement Program (HSIP) and the Highway Safety Plan (HSP). During this workshop, the state presented their methodology to the MPO's and discussed a coordination and collaboration process between the State DOT (HSIP and HSP) and MPO's. **The numbers and rates for the five safety performance measures/targets are annually gathered and adjusted in accordance with the SHSP goal of a 50% reduction of fatalities and serious injuries by the year 2030.**

Does the State want to report additional optional targets?

No

Enter additional comments here to clarify your response for this question or add supporting information.

Applicability of Special Rules

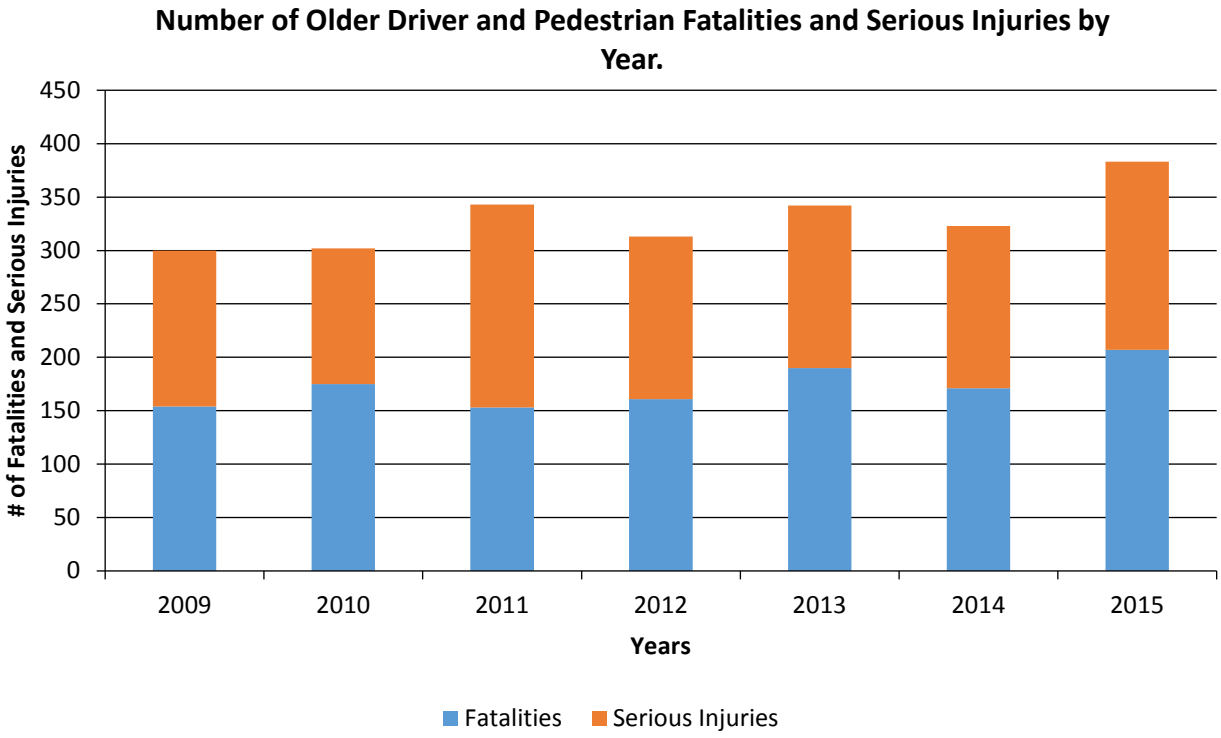
Does the HRRR special rule apply to the State for this reporting period?

No

Enter additional comments here to clarify your response for this question or add supporting information.

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

PERFORMANCE MEASURES	2009	2010	2011	2012	2013	2014	2015
Number of Older Driver and Pedestrian Fatalities	154	175	153	161	190	171	207
Number of Older Driver and Pedestrian Serious Injuries	146	127	190	152	152	152	176



Enter additional comments here to clarify your response for this question or add supporting information.

Evaluation

Program Effectiveness

How does the State measure effectiveness of the HSIP?

Benefit/Cost Ratio

Enter additional comments here to clarify your response for this question or add supporting information.

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?

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

Enter additional comments here to clarify your response for this question or add supporting information.

NCDOT has initiated a project to study the impacts of wide edge markings on two-lane rural roads. 60% of all highway fatalities in North Carolina are a result of roadway departure crashes.

NCDOT has invested in several systemic programs including upgrading guardrail end units, installing long life pavement markings for positive guidance, and funding of vulnerable user projects.

NCDOT conducted six RSAs in 2016. The NCDOT Road Safety Audit (RSA) Program is designed and managed to reduce crashes and injuries by generating safety projects/actions, assist field staff in addressing persistent safety problem areas, and improve collaboration amongst stakeholders. NCDOT conducts RSAs in an effort to support HSIP project origination and project development. NCDOT RSAs are conducted with Department-wide support to ensure perspectives of trained personnel who understand NCDOT policy and procedures. Local stakeholders can bring RSA requests forward for both State-maintained and non-State maintained roadways and NCDOT will assist in either case. NCDOT conducts RSAs on corridors with multiple HSIP locations, and they also query the Field Engineers and Field Division staff for locations where RSAs could lead to potential HSIP projects. Staff from regions throughout the State participate in the RSAs in other regions, ensuring an outside perspective is obtained in the RSA process.

Safety benefits is now part of the Stragetic Mobility Formula. The Strategic Transportation Investment (STI) established the Strategic Mobility Formula, which allocates available revenues based on data-driven scoring and local input. The STI is used to develop NCDOT's State Transportation Improvement Program, which identifies the transportation projects that will receive funding during a specified 10-year period.

Are there any significant programmatic changes that have occurred since the last reporting period?

Yes

Describe significant program changes that have occurred since the last reporting period.

Many supervisors and managers in NCDOT have a performance metric for crash rates listed in their year-end appraisal.

NCDOT also has initiated a program to improve the safety performance of our Secondary Road System. This program includes the following components:

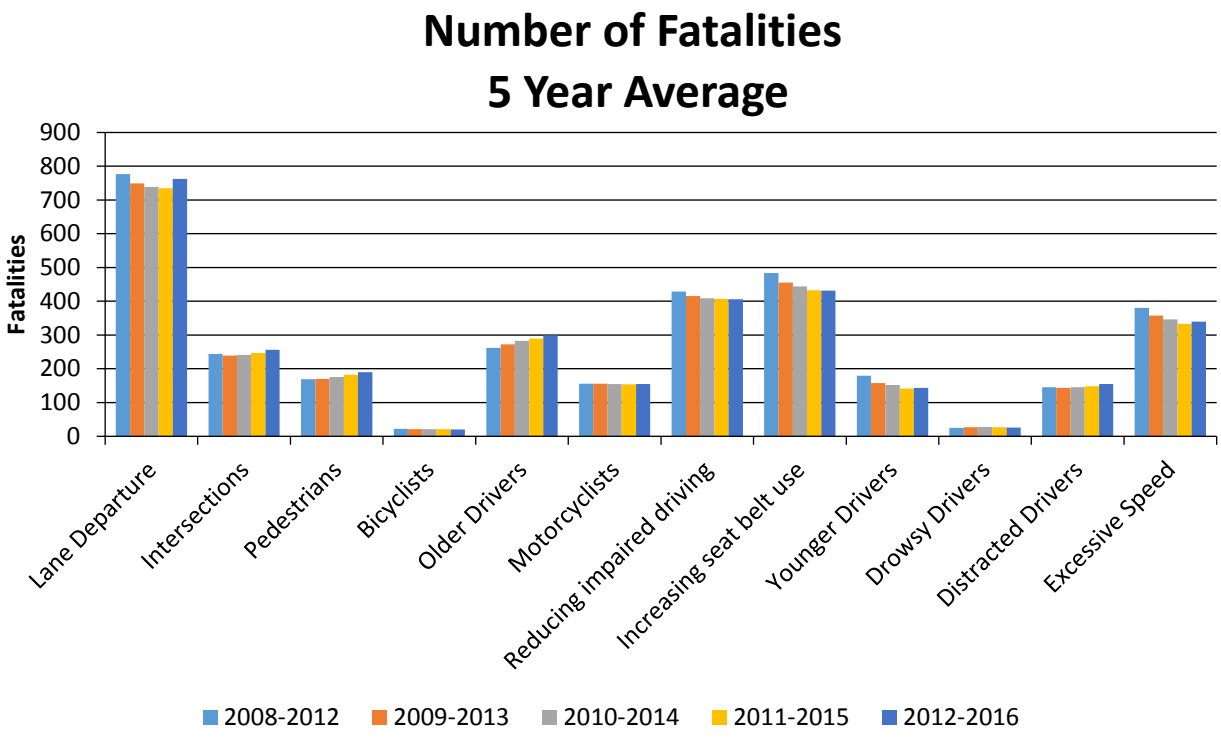
- Increase the coordination of highway safety activities between the Division of Highways and the Governor's Highway Safety Program (GHSP).
- Review 1000 miles of secondary roadways with statutory 55 mph speed limits each year.
- Develop a Systemic Intersection Safety Program.
- Integrate Safety Analysis Processes into Resurfacing Program.

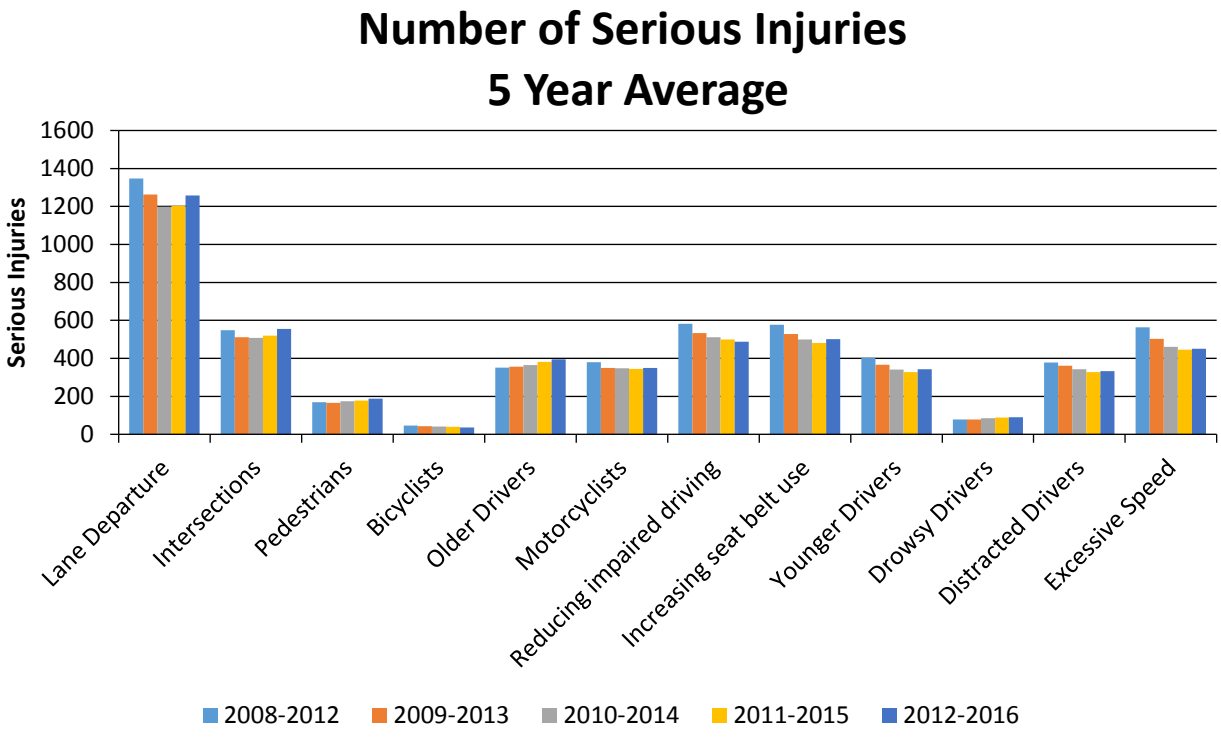
Effectiveness of Groupings or Similar Types of Improvements

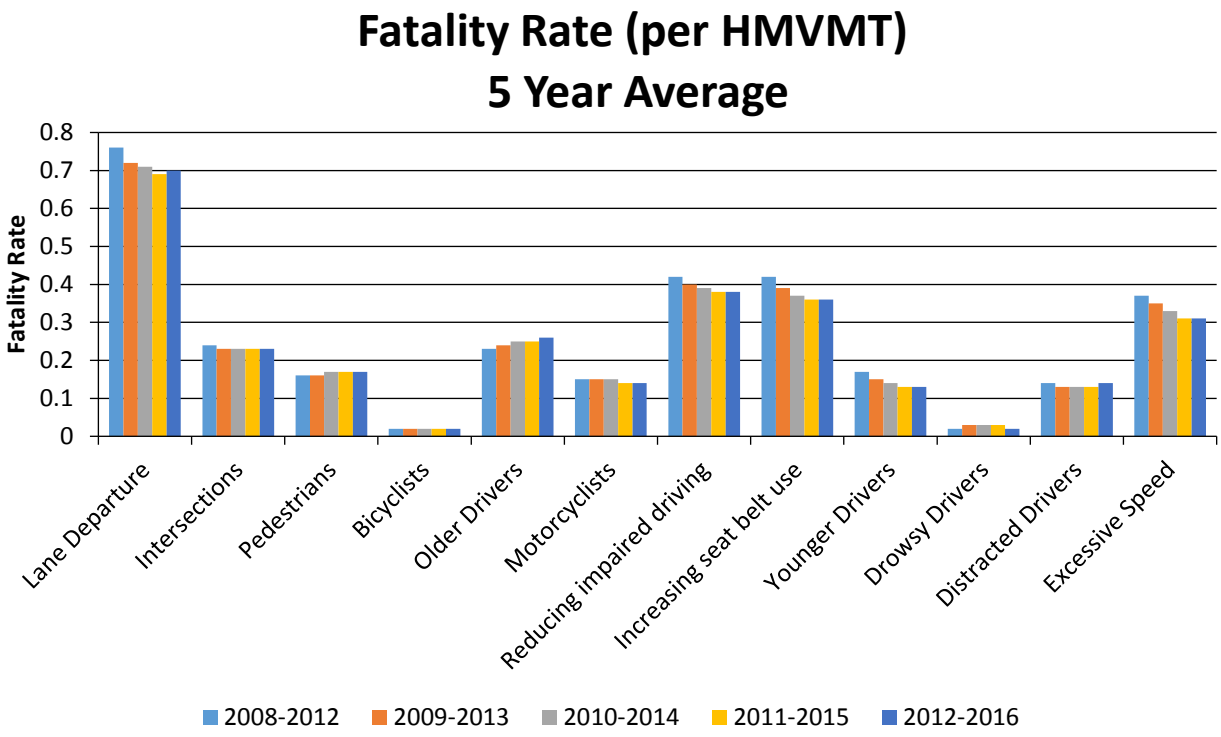
Present and describe trends in SHSP emphasis area performance measures.

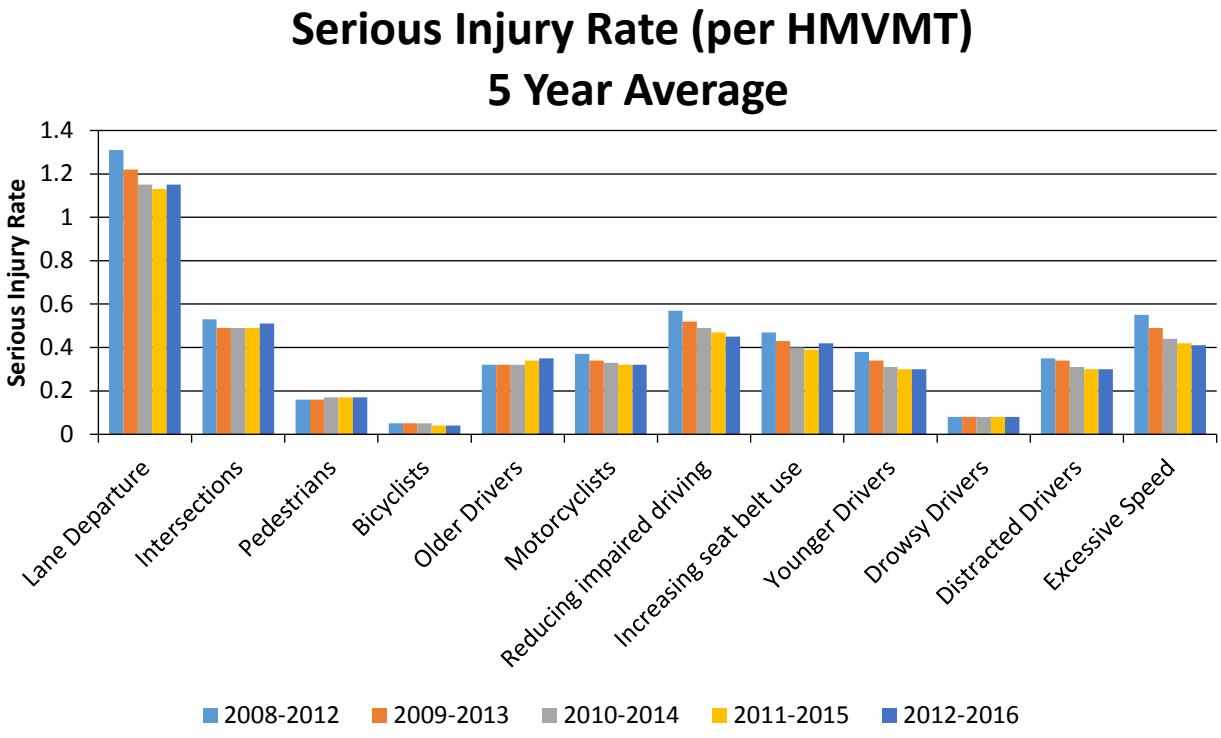
Year 2016

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)	Other 1	Other 2	Other 3
Lane Departure	Run-off-road	762.8	1,258.2	0.7	1.15			
Intersections	Intersections	255.8	555	0.23	0.51			
Pedestrians	Vehicle/pedestrian	190.2	187.4	0.17	0.17			
Bicyclists	Vehicle/bicycle	20.4	36	0.02	0.04			
Older Drivers	Over Age 64 Driver-Related Crashes	299	395	0.26	0.35			
Motorcyclists	Motorcycle Crashes	155.2	349.8	0.14	0.32			
Reducing impaired driving	Alcohol and/or Drug Related Crashes	405.8	488	0.38	0.45			
Increasing seat belt use	Unbelted Occupants	431.8	500.4	0.36	0.42			
Younger Drivers	Under Age 21 Driver-Related Crashes	143	342	0.13	0.3			
Drowsy Drivers	Drowsy Driver-Related Crashes	26.2	89.4	0.02	0.08			
Distracted Drivers	Distracted Driver-Related Crashes	155	333.2	0.14	0.3			
Excessive Speed	Exceeding authorized speed limit and/or safe speed for conditions	339.6	451	0.31	0.41			


Number of Fatalities
5 Year Average
Fatalities
900
800
700
600
500
400
300
200
100
0
Lane Departure
Intersections
Pedestrians
Bicyclists
Older Drivers
Motorcyclists
Reducing impaired driving
Increasing seat belt use
Younger Drivers
Drowsy Drivers
Distracted Drivers
Excessive Speed
2008-2012
2009-2013
2010-2014
2011-2015
2012-2016


Number of Serious Injuries
5 Year Average
Serious Injuries
1600
1400
1200
1000
800
600
400
200
0
Lane Departure
Intersections
Pedestrians
Bicyclists
Older Drivers
Motorcyclists
Reducing impaired driving
Increasing seat belt use
Younger Drivers
Drowsy Drivers
Distracted Drivers
Excessive Speed
2008-2012
2009-2013
2010-2014
2011-2015
2012-2016





Enter additional comments here to clarify your response for this question or add supporting information.

SHSP Emphasis Area rates are based on statewide Vehicle-Miles Traveled

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

2017 North Carolina Highway Safety Improvement Program

No

Enter additional comments here to clarify your response for this question or add supporting information.
The NCDOT Safety Evaluation Group (SEG) conducts large scale studies using data from locations across the State. As we
complete multiple evaluations for a particular type of countermeasure, we are able to provide objective and definite information regarding actual crash reduction factors. Some of the recent topic areas include: All-Way Stops, Roundabouts, Overhead Flashing Beacons, Flashing Yellow Arrow, Vehicle Entering When Flashing Signs, Flashers in School Zones, Speed Enforcement Programs, and Paved Shoulders. The methodologies used in the evaluations offer various philosophies and ideas. When possible and appropriate, we attempt to use statistical analysis to account for potential study biases. Numerous countermeasure-oriented safety studies completed by SEG have been published in peer-reviewed journals.

Project Effectiveness

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

LOCATION	FUNCTIONAL CLASS	IMPROVEMENT CATEGORY	IMPROVEMENT TYPE	PDO BEFORE	PDO AFTER	FATALITY BEFORE	FATALITY AFTER	SERIOUS INJURY BEFORE	SERIOUS INJURY AFTER	ALL INJURY BEFORE	ALL INJURY AFTER	TOTAL BEFORE	TOTAL AFTER	EVALUATION RESULTS (BENEFIT/COST RATIO)
See Comments Below														

Enter additional comments here to clarify your response for this question or add supporting information.

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 link below: https://connect.ncdot.gov/resources/safety/Pages/Safety-Evaluation.aspx

Are there any other aspects of the overall HSIP effectiveness on which the State would like to elaborate?

Yes

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:
I. Development of warranting criteria
II. Identification of potentially hazardous locations meeting minimum warrant criteria
III. Detailed crash analysis of program locations
IV. Engineering field investigation of program locations and evaluation of potential recommendations (where appropriate)
V. Project development
VI. Implement countermeasures
VII. 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.

Compliance Assessment

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

01/01/2014

What are the years being covered by the current SHSP?

From: 2014 To: 2018

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

2019

Enter additional comments here to clarify your response for this question or add supporting information.

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

	NON LOCAL PAVED ROADS - SEGMENT		NON LOCAL PAVED ROADS - INTERSECTION		NON LOCAL PAVED ROADS - RAMPS		LOCAL PAVED ROADS		UNPAVED ROADS	
MIRE NAME (MIRE NO.)	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE
ROADWAY SEGMENT										
Segment Identifier (12)	100	100					100	100	100	100
Route Number (8)	100	100								
Route/Street Name (9)	100	100								
Federal Aid/Route Type (21)	100	100								
Rural/Urban Designation (20)	100	100					100	100		
Surface Type (23)	100	0					100	0		
Begin Point Segment Descriptor (10)	100	100					100	100	100	100
End Point Segment Descriptor (11)	100	100					100	100	100	100
Segment Length (13)	100	100								
Direction of Inventory (18)	100	100								
Functional Class (19)	100	100					100	100	100	100
Median Type (54)	100	0								

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)	100	0								
One/Two Way Operations (91)	100	0								
Number of Through Lanes (31)	100	100					10	10		
Average Annual Daily Traffic (79)	100	100					10	10		
AADT Year (80)	100	100								
Type of Governmental Ownership (4)	100	0					100	0	100	0
INTERSECTION										
Unique Junction Identifier (120)			100	100						
Location Identifier for Road 1 Crossing Point (122)			100	100						
Location Identifier for Road 2 Crossing Point (123)			100	100						
Intersection/Junction Geometry (126)			0	0						
Intersection/Junction Traffic Control (131)			0	0						
AADT for Each Intersecting Road (79)			0	0						
AADT Year (80)			0	0						
Unique Approach Identifier (139)			0	0						
INTERCHANGE/RAMP										
Unique Interchange Identifier (178)					0	0				
Location Identifier for Roadway at Beginning of Ramp Terminal (197)					0	0				
Location Identifier for Roadway at Ending Ramp Terminal (201)					100	100				
Ramp Length (187)					100	100				
Roadway Type at Beginning of Ramp Terminal (195)					0	0				

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 Type at End Ramp Terminal (199)					100	100				
Interchange Type (182)					0	0				
Ramp AADT (191)					100	100				
Year of Ramp AADT (192)					100	100				
Functional Class (19)					100	100				
Type of Governmental Ownership (4)					100	100				
Totals (Average Percent Complete):	**100.00**	**72.22**	**37.50**	**37.50**	**63.64**	**63.64**	**80.00**	**57.78**	**100.00**	**80.00**

Enter additional comments here to clarify your response for this question or add supporting information.

For (79) and (80), these fields are not explicitly stored but can be derived.

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.

NCDOT has completed a gap assessment of the MIRE fundamental data elements. The largest gaps currently exist for intersection elements. NCDOT has recently partnered with a consultant on a pilot project to collect intersection characteristic data at 3,000 rural intersections in the State. The knowledge gathered from this project will help to inform future efforts by the Department to collect more MIRE elements.

Provide the suspected serious injury identifier, definition and attributes used by the State for both the crash report form and the crash database using the table below. Please also indicate whether or not these elements are compliant with the MMUCC 4th edition criteria for data element P5. Injury Status, suspected serious injury.

CRITERIA	SUSPECTED SERIOUS INJURY IDENTIFIER(NAME)	MMUCC 4TH EDITION COMPLIANT *	SUSPECTED SERIOUS INJURY DEFINITION	MMUCC 4TH EDITION COMPLIANT *	SUSPECTED SERIOUS INJURY ATTRIBUTES(DESCRIPTORS)	MMUCC 4TH EDITION COMPLIANT *
Crash Report Form	Suspected Serious Injury (A)	Yes	N/A	Yes	N/A	Yes
Crash Report Form Instruction Manual	Suspected Serious Injury (A)	Yes	A suspected serious injury is any injury other than fatal which results in one or more of the following:	Yes	* Severe laceration resulting in exposure of underlying tissues/ muscle/ organs or resulting in significant loss of blood. * Broken or distorted extremity (arm or leg) * Crush injuries * Suspected skull, chest or abdominal injury other than bruises or minor lacerations * Significant burns (second and third degree burns over 10% or more of the body) * Unconsciousness when taken from the crash scene * Paralysis	Yes
Crash Database	Suspected Serious Injury (A)	Yes	N/A	Yes	N/A	Yes

CRITERIA	SUSPECTED SERIOUS INJURY IDENTIFIER(NAME)	MMUCC 4TH EDITION COMPLIANT *	SUSPECTED SERIOUS INJURY DEFINITION	MMUCC 4TH EDITION COMPLIANT *	SUSPECTED SERIOUS INJURY ATTRIBUTES(DESCRIPTORS)	MMUCC 4TH EDITION COMPLIANT *
Crash Database Data Dictionary	Suspected Serious Injury (A)	Yes	A suspected serious injury is any injury other than fatal which results in one or more of the following:	Yes	* Severe laceration resulting in exposure of underlying tissues/ muscle/ organs or resulting in significant loss of blood. * Broken or distorted extremity (arm or leg) * Crush injuries * Suspected skull, chest or abdominal injury other than bruises or minor lacerations * Significant burns (second and third degree burns over 10% or more of the body) * Unconsciousness when taken from the crash scene * Paralysis	Yes

Enter additional comments here to clarify your response for this question or add supporting information.

Did the State conduct an HSIP program assessment during the reporting period?

Yes

Describe the purpose and outcomes of the State's HSIP program assessment.

The Traffic Safety Unit (TSU) has a strong, positive relationship with multiple internal and external partners. TSU and GHSP Teams work together to share information, initiatives, leverage resources and coordinate efforts. TSU engineers are able to make data-driven safety decisions due to a robust crash data system. NCDOT selects HSIP projects based on safety benefit/cost (b/c) and reviews systemic and hotspot projects using a decision support tool Safety Index. NCDOT has an advanced evaluation program that enables them to gain the necessary feedback to make policy level decisions.
NC's HSIP program has many opportunities for growth. They include training and utilizing contract forces for preliminary engineering and design; this will allow the department to study additional sites and more opportunities to find additional cost-effective safety projects. Another opportunity is utilizing SPF's to increase involvement within the TIP planning process. Also NCDOT is searching for a more formalized framework to blend spot treatments with systemic programming needs.

Optional Attachments

Program Structure:

Project Implementation:

Safety Performance:

Evaluation:

Compliance Assessment:

PY17 HSIP Assessment_NCDOT response.pdf

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.