

NDDOT Highway Safety Improvement Program Guidebook



Prepared By:
North Dakota Department of Transportation
Programming Division
Traffic Operations Section

August 2021

Table of Contents

HSIP OVERVIEW 3

HSIP PROJECTS 3

PROGRAM ADMINISTRATION & SOLICITATION..... 4

SYSTEMIC ANALYSIS (LRSP)..... 5

FATAL CRASH REVIEW TEAM..... 5

ROAD SAFETY REVIEWS..... 5

HIGH CRASH LISTINGS..... 6

HOW TO APPLY 7

PROGRAM SCHEDULE 8

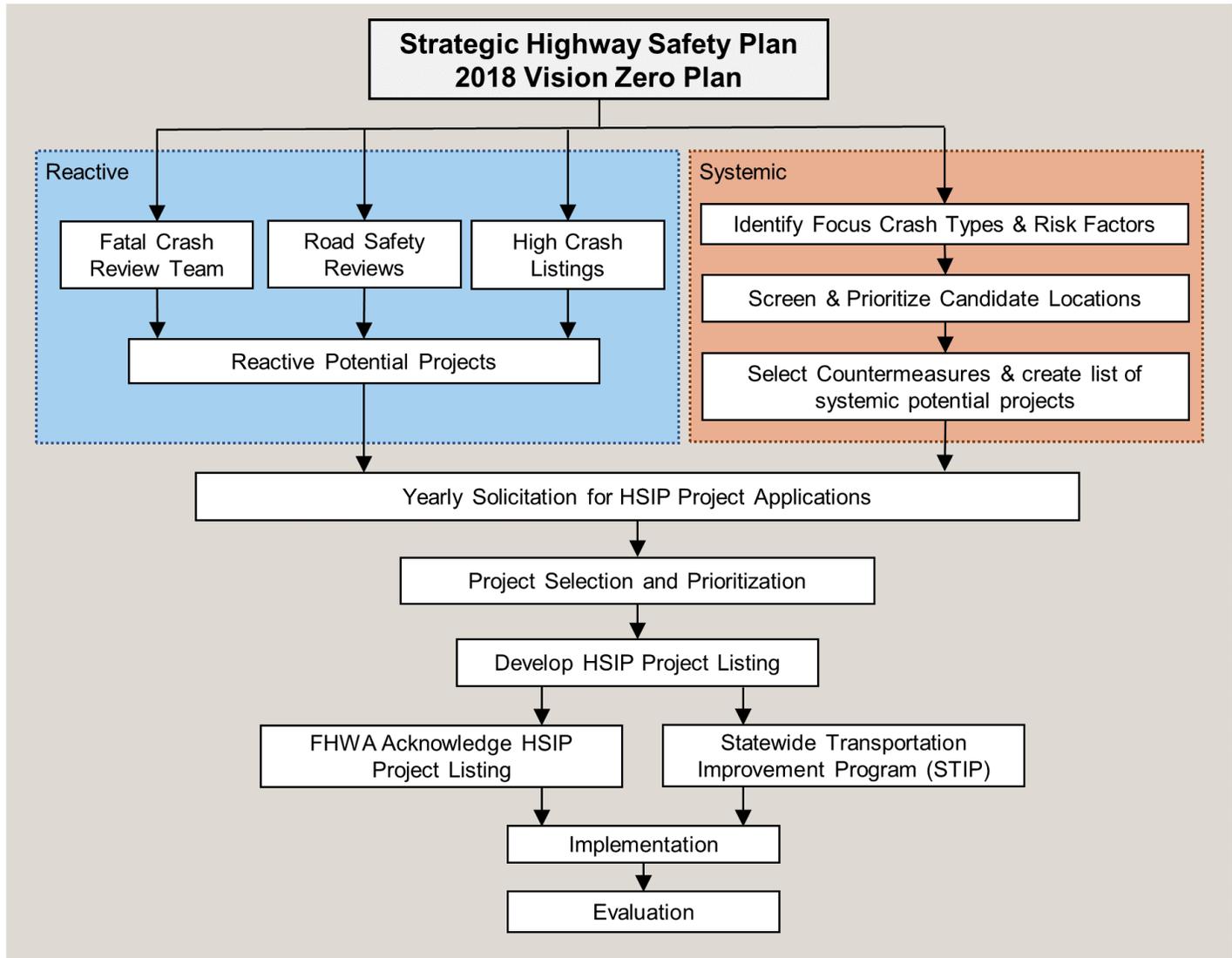
PROJECT SELECTION AND PRIORITIZATION..... 8

HSIP COST PARTICIPATION..... 9

Appendix A – HSIP Application Form 10

HSIP OVERVIEW

The purpose of the overall HSIP program is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads through the implementation of infrastructure-related highway safety improvements. This document provides a procedure for planning safety projects in North Dakota. This document may also be used to identify safety countermeasures for regular funded projects.



HSIP PROJECTS

The HSIP program is based on the [Strategic Highway Safety Plan](#). To be consistent with the SHSP, HSIP projects must relate to at least one of the six emphasis areas:

- Lane departure
- Intersections
- Alcohol and/or drug related
- Unbelted vehicle occupants
- Speeding/aggressive driving
- Young drivers

A highway safety improvement project includes a project for 1 or more of the following:

- i. An intersection safety improvement.
- ii. Pavement and shoulder widening (including addition of a passing lane to remedy an unsafe condition).
- iii. Installation of rumble strips or another warning device, if the rumble strips or other warning devices do not adversely affect the safety or mobility of bicyclists and pedestrians, including persons with disabilities.
- iv. Installation of a skid-resistant surface at an intersection or other location with a high frequency of crashes.

- v. An improvement for pedestrian or bicyclist safety or safety of persons with disabilities.
- vi. Construction and improvement of a railway-highway grade crossing safety feature, including installation of protective devices.
- vii. The conduct of a model traffic enforcement activity at a railway-highway crossing.
- viii. Construction of a traffic calming feature.
- ix. Elimination of a roadside hazard.
- x. Installation, replacement, and other improvement of highway signage and pavement markings, or a project to maintain minimum levels of retro reflectivity that addresses a highway safety problem consistent with a State strategic highway safety plan.
- xi. Installation of a priority control system for emergency vehicles at signalized intersections.
- xii. Installation of a traffic control or other warning device at a location with high crash potential.
- xiii. Transportation safety planning.
- xiv. Collection, analysis, and improvement of safety data.
- xv. Planning integrated interoperable emergency communications equipment, operational activities, or traffic enforcement activities (including police assistance) relating to work zone safety.
- xvi. Installation of guardrails, barriers (including barriers between construction work zones and traffic lanes for the safety of road users and workers), and crash attenuators.
- xvii. The addition or retrofitting of structures or other measures to eliminate or reduce crashes involving vehicles and wildlife.
- xviii. Installation of yellow-green signs and signals at pedestrian and bicycle crossings and in school zones.
- xix. Construction and operational improvements on high risk rural roads.
- xx. Geometric improvements to a road for safety purposes that improve safety.
- xxi. A road safety review (*Note: ND does not allow road safety reviews to be standalone safety projects, however any eligible safety countermeasures that are recommended from the road safety review may be developed into a safety project. See following page for more information.*)
- xxii. Roadway safety infrastructure improvements consistent with the recommendations included in the publication of the Federal Highway Administration entitled “Highway Design Handbook for Older Drivers and Pedestrians” (FHWA–RD–01–103), dated May 2001 or as subsequently revised and updated.
- xxiii. Truck parking facilities eligible for funding under section 1401 of the MAP–21.
- xxiv. Systemic safety improvements.
- xxv. Installation of vehicle-to-infrastructure communication equipment.
- xxvi. Pedestrian hybrid beacons.
- xxvii. Roadway improvements that provide separation between pedestrians and motor vehicles, including medians and pedestrian crossing islands.
- xxviii. A physical infrastructure safety project not described in clauses (i) through (xxvii).

This list is from [Title 23 U.S.C. 148](#) which includes legislative and regulatory requirements. Additional HSIP guidance and project categories can be found in FHWA’s [“Highway Safety Improvement Program Reporting Guidance”](#) under “Attachment 1: Highway Safety Improvement Categories”.

PROGRAM ADMINISTRATION & SOLICITATION

The annual Highway Safety Improvement Program (HSIP) funds are allocated through the NDDOT Programming Division. Applications for HSIP projects are available on the [NDDOT website](#). An annual solicitation letter is sent out in the fall to the following:

- NDDOT Director
- NDDOT Deputy Director for Engineering
- NDDOT Deputy Director for Driver Safety
- NDDOT All Office Holders
- NDDOT All District Engineers
- NDDOT All Engineering Division Directors
- NDDOT Communications Division
- NDDOT Safety Division
- NDDOT Local Government Division
- Spirit Lake Reservation
- Standing Rock Nation
- Three Affiliated Tribes
- Turtle Mountain Band of Chippewa
- FHWA Safety and Traffic Operations Engineer
- ND Highway Patrol
- County Engineers / Highway Superintendents

- City Engineers and City Traffic Engineers (only cities with an urban high crash locations)
- MPO/COG
- Upper Great Plains Transportation Institute (ATAC, LTAP, and RTSSC)
- Theodore Roosevelt National Park

SYSTEMIC ANALYSIS (LRSP)

In the past, safety funds were focused mostly on infrastructure projects on state highways and were identified by high crash locations. Based on a commitment in the 2013 North Dakota Strategic Highway Safety Plan (SHSP), the NDDOT developed “Local Road Safety Programs” (LRSP’s) for North Dakota. The LRSP’s have developed a systemic process to provide application of high-priority/low-cost safety strategies at “at-risk” locations. Any project listed in the [LRSP document](#) is considered eligible.

A systemic analysis to develop potential projects should follow the [“Systemic Safety Project Selection Tool”](#) document from FHWA.

FATAL CRASH REVIEW TEAM

The NDDOT will conduct a formal review for any fatal crash that occurs on state highways and/or in construction work zones. Action to be taken will be determined by the Executive Fatal Crash Review Team:

- NDDOT Safety Division Director (Chair)
- NDDOT Design Division Director
- NDDOT District Engineer
- NDDOT Programming Division Engineer
- NDDOT Maintenance Engineer
- NDDOT Deputy Director for Engineering

ROAD SAFETY REVIEWS

A road safety review (RSR) is a site visit of a roadway or intersection by a multi-disciplinary team in order to identify changes that may improve safety. The goal of the RSR is to answer the following questions:

- What elements of the road may present a safety concern: to what extent, to which road users, and under what circumstances?¹
- What opportunities exist to eliminate or mitigate identified safety concerns?¹

RSRs are typically requested by a Local Public Agency (LPA) or the NDDOT District. The road safety review is coordinated by the NDDOT traffic operations section. RSRs invite list:

- NDDOT Traffic operations
- NDDOT District
- NDDOT Traffic Safety Design Section
- NDDOT Roadway Design Section
- NDDOT Safety Division
- NDDOT Local Government
- FHWA Safety Engineer
- City and/or County Engineer
- MPO
- Regional Vision Zero Coordinator
- Local law enforcement (HP, City Police, Sheriff, BIA, etc)
- Other local officials as needed

A formal response report is generated after a RSR is conducted and shared with the stakeholders.

References:

1. FHWA, [Road Safety Audits \(RSA\)](#), 2014.

HIGH CRASH LISTINGS

In order to give greater importance to crashes with greater severity, the High Crash Location process uses EPDO weighting factors:

KABCO Scale	Crash severity	EPDO Weighting Factor
K	Fatal	100
A	Incapacitating Injury	55
B	Non-incapacitating Injury	17
C	Possible Injury	11
O or PDO	No Injury / Property Damage Only	1

The KABCO scale was developed by the National Safety Council. The EPDO weighting factors are based on comprehensive crash costs². For fatal crashes, actual ratio is 542:1, however 100:1 was chosen so that locations with a fatal crash do not immediately jump to the top of the ranking lists.

$$\text{EPDO Weighted Total} = (\text{"K" Crashes}) \times 100 + (\text{"A" Crashes}) \times 55 + (\text{"B" Crashes}) \times 17 + (\text{"C" Crashes}) \times 11 + \text{PDO Crashes}$$

Three sets of informational maps/lists are prepared by NDDOT each year. The following describes the crash location process.

Urban High Crash Locations

SHSP Emphasis Area:	Intersections
Locations analyzed:	Spots (intersections or links) on all public roads with the major cities: Bismarck, Devils Lake, Dickinson, Fargo, Grand Forks, Jamestown, Mandan, Minot, Valley City, Wahpeton, West Fargo, Williston
Number of years of data:	3
Ranked by:	EPDO Weighted total
Number of locations:	50
Base criteria:	A minimum of 15 crashes is required for a location to appear on this list
Documents prepared:	One statewide list is prepared. City-specific maps/lists are prepared for each city that has an urban crash location. Adjacent cities, such as Bismarck-Mandan or Fargo-West Fargo can be shown on the same map.

Rural Intersection High Crash Locations

SHSP Emphasis Area:	Intersections
Locations analyzed:	Intersections on all public roads outside the major cities
Number of years of data:	5
Ranked by:	EPDO Weighted total
Number of locations:	25
Base criteria:	Animal crashes are excluded. A minimum of 5 crashes is required for a location to appear on this list.
Documents prepared:	One statewide map/list is prepared

Highway Segment Crash Map

SHSP Emphasis Area:	Lane Departure
Locations analyzed:	RIMS construction segments on Interstate, US, and ND highways
Number of years of data:	3
Ranked by:	EPDO weighted total per mile
Number of locations:	All segments ≥ 1.0 mile
Base criteria:	Animal crashes are excluded. Intersection-related crashes are excluded. A minimum segment length of 1.0 mile is required for a location to appear on this list. In urban areas, only interstate segments are included (other state highway segments within urban areas area excluded).
Documents prepared:	one statewide map is prepared

References:

1. FHWA, [Crash Costs for Highway Safety Analysis](#), 2018. (Page 2)

Distribution of High Crash Lists/Maps typically occurs during the summer to the following:

- FHWA Safety/Traffic Operations/ITS Engineer
- North Dakota Highway Patrol
- NDDOT Executive Office (Director, Deputy Directors, and Office Holders)
- NDDOT District Engineers
- NDDOT Communication Division
- All NDDOT Engineering Division Directors
- Spirit Lake Reservation
- Standing Rock Nation
- Three Affiliated Tribes
- Turtle Mountain Band of Chippewa
- Theodore Roosevelt National Park
- ND UGPTI-LTAP
- NDDOT Local Government
- City Engineers (12 major cities)
- City Traffic Engineer (12 major cities)
- MPO/COG
- ND League of Cities
- City Police
- County Highway Engineer
- County Highway Superintendent
- Sheriff

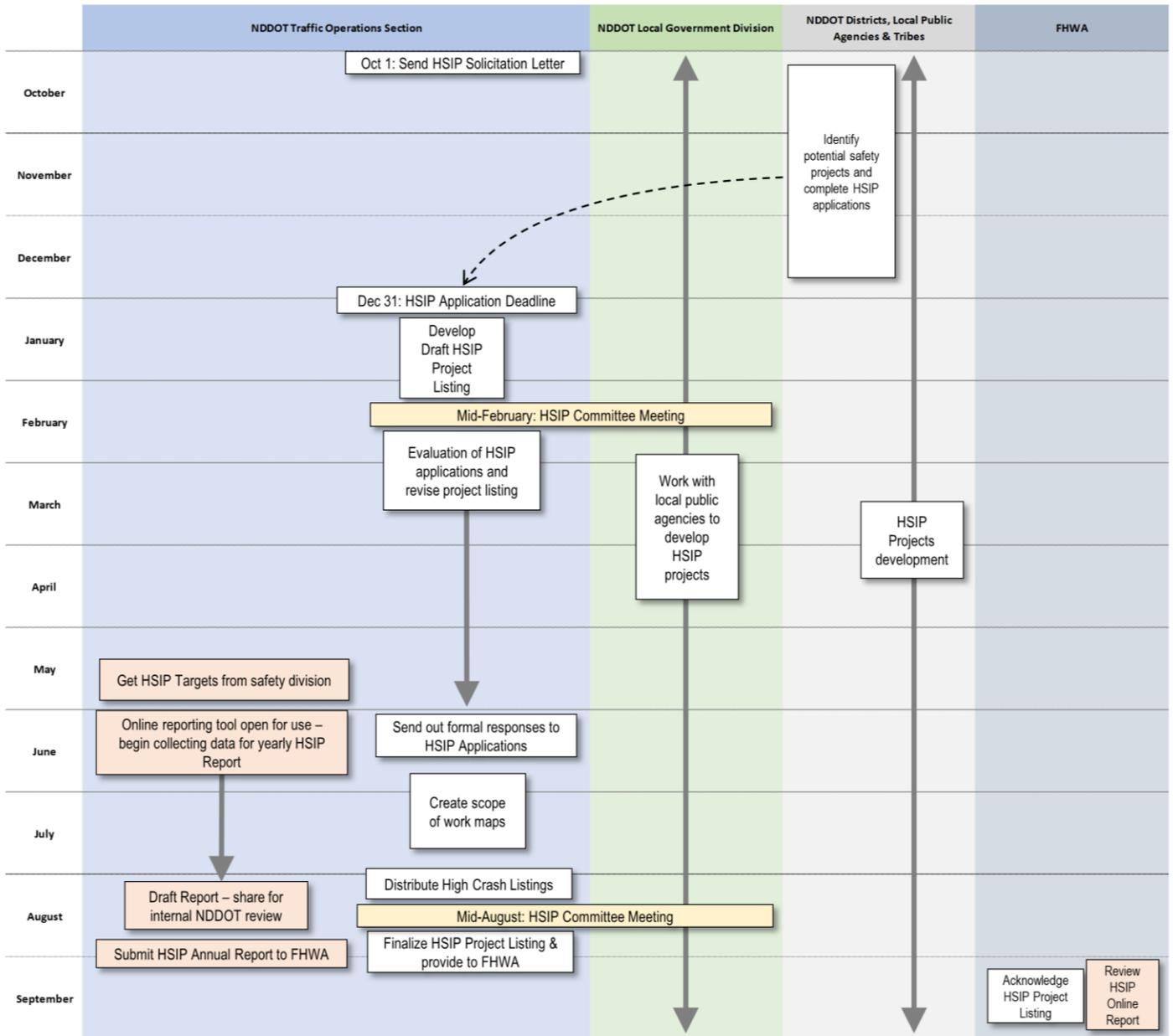
HOW TO APPLY

- Review your LRSP document and select any desired projects. The back of each document has completed HSIP project application forms. That form is all that needs to be submitted as documentation for LRSP projects. Consider grouping forms in an application to create larger projects.
- Use your knowledge of your system and your experience. Think about any other potential locations and projects that may fit eligibility and have the potential to reduce severe crashes.
- Complete a safety engineering study. A safety engineering study is an analysis and evaluation of available information to diagnose safety concerns and the identification of countermeasures to address the concerns. A study may include but is not limited to:
 - Location map clearly indicating where the proposed project is located.
 - Crash data analysis (Contact jjschlosser@nd.gov to get crash data from NDDOT).
 - Not all projects have to be high crash locations, projects may address a reduction in crash potential for an identified crash issue.
 - Traffic volume data if applicable.
 - Input from stakeholders such as law enforcement, EMS, roadway maintenance, schools, etc.
 - Information from a site visit to document items such as sight lines, physical limitations, traffic movements, and adjacent land uses.
 - Explanation of safety concern and how proposed countermeasure will address concern.
 - The level of study will depend on the scope and complexity of the proposed project. Refer to the [NDDOT website](#) for traffic operations resources to assist in completion of studies.
- Identify scope of project and prepare cost estimate.
- Complete your HSIP project application by completing the [SFN form](#) and submit with your safety engineering study by email to hsip@nd.gov no later than December 31.

Feel free to contact Justin Schlosser (jjschlosser@nd.gov or 701-328-2673), for assistance regarding questions you may have about project eligibility and/or the application process.

PROGRAM SCHEDULE

The typical schedule for ND's HSIP follows the federal fiscal year and is shown below.



PROJECT SELECTION AND PRIORITIZATION

Projects will be reviewed and prioritized by NDDOT Programming Division. The selection and approval of projects will depend on the proposed improvements and how well they follow the SHSP. Some proposed improvements may be combined with other projects (bundling). Where possible, safety improvements may not receive dedicated safety funds but will be combined with regular funded projects. The ND HSIP funds are proposed to be directed towards approximately 50% of projects on the local system, 50% on the state system.

The order of priority for the HSIP program is as follows:

1. Previously approved projects
2. NDDOT high profile projects
3. Prioritize projects based on the 50/50 local vs state distribution

HSIP COST PARTICIPATION

Cost participation¹ for HSIP projects is as follows:

<u>Roadway system</u>	<u>Federal</u>	<u>State</u>	<u>Local</u>
Urban primary regional system	90%	10%	0%
Urban secondary regional system	90%	5%	5%
Urban roads	90%	0%	10%
County and off system	90%	0%	10%
Rural state highways	90%	10%	0%*
Tribal roadways (local & state system)	100%	0%	0%

*Follow NDDOT policy for urban areas less than a population of 5000.

References:

1. NDDOT, [Local Government Manual](#), January 2017

**HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)
PROJECT APPLICATION**

North Dakota Department of Transportation, Programming
SFN 59959 (11-2019)

**23 USC § 409 Documents
NDDOT Reserves All Objections**

Please attach a location map(s). You may use additional sheets to further describe your project.

Agency Name		NDDOT District	
Contact Name		Current Date	
Email Address	Telephone Number	Project Cost Estimate (attach detailed copy)	
Location Description	Roadway Ownership <input type="checkbox"/> State <input type="checkbox"/> County <input type="checkbox"/> City <input type="checkbox"/> Tribe	Vision Zero Emphasis Area (check all that apply) <input type="checkbox"/> Younger Drivers <input type="checkbox"/> Speeding or Aggressive Drivers <input type="checkbox"/> Alcohol-Related <input type="checkbox"/> Unbelted Vehicle Occupants <input type="checkbox"/> Lane Departure <input type="checkbox"/> Intersections	Functional Class <input type="checkbox"/> Local Road or Street <input type="checkbox"/> Minor Collector <input type="checkbox"/> Major Collector <input type="checkbox"/> Minor Arterial <input type="checkbox"/> Principal Arterial
Improvement Category (check all that apply)			
<input type="checkbox"/> Access Management	<input type="checkbox"/> Intersection Geometry	<input type="checkbox"/> Parking	<input type="checkbox"/> Roadway Delineation
<input type="checkbox"/> Advanced Technology & ITS	<input type="checkbox"/> Intersection Traffic Control	<input type="checkbox"/> Pedestrians & Bicyclists	<input type="checkbox"/> Roadway Signs & Traffic Control
<input type="checkbox"/> Alignment	<input type="checkbox"/> Lighting	<input type="checkbox"/> Railroad Grade Crossings	<input type="checkbox"/> Shoulder Treatments
<input type="checkbox"/> Animal Related	<input type="checkbox"/> Miscellaneous	<input type="checkbox"/> Roadside	<input type="checkbox"/> Speed Management
<input type="checkbox"/> Interchange Design	<input type="checkbox"/> Non-infrastructure	<input type="checkbox"/> Roadway	<input type="checkbox"/> Work Zone
Describe Current Safety Issues			
Describe Proposed Safety Improvements			

For questions or comments contact:
Justin Schlosser
701-328-2673
jjschlosser@nd.gov