## Introduction

*Emerging Issues and Data* is one of nine emphasis areas of the North Carolina Strategic Highway Safety Plan. This emphasis area includes strategies related to improving the quality of traffic safety data, including crash data, roadway data, driver data, vehicle data, citation data, and injury data. It also encompasses a broader topic of emerging issues to highlight the flexibility needed in a strategic plan to address issues and opportunities that arise as a result of advances in technologies, scientific knowledge, and research findings. Throughout the implementation of the Plan, data will be used to identify and address these emerging issues.

## Background

Good quality data are critical to all areas of the Strategic Highway Safety Plan (SHSP). Crash data are used as the primary source for defining the magnitude and location of highway safety problems. However, many other types of data—related to roadways, drivers, vehicles, citations, and injuries—must be used to supplement and interpret the crash data picture and provide direction for safety-focused actions.

The most recent federal transportation bill, Moving Ahead for Progress in the 21st Century Act (MAP-21), placed an increased focus on data for improving the decisions of agencies. The Federal Highway Administration recently released proposed rulemaking for implementing the requirements of MAP-21. The proposed rulemaking on performance measures advises that States track their safety performance according to the number and rate of fatalities and serious injuries (National Performance Management Measures, 2014). It also recommends that States be prepared to link their crash and medical data to determine the occurrence of serious injuries in crashes. The proposed rulemaking for the Highway Safety Improvement Program (HSIP) regulations would require States to collect a certain set of characteristics on all public road miles, including local roads (HSIP, 2014). These federal documents emphasize the need for North Carolina to focus on improving its road safety data. The inclusion of a new data-specific emphasis area in this SHSP (not included in previous SHSPs) demonstrates North Carolina's commitment to quality data.

Another aspect of this emphasis area is the need to anticipate new and emerging issues that may arise. For example, as research progresses, new knowledge is developed on the effectiveness of existing crash countermeasures, leading to improved decision-making on whether and where to implement the countermeasures. In addition, new countermeasures that are being developed and evaluated will add to the number of "tools in the toolbox." Other aspects of the highway safety field are projected to change as technology advances, allowing for previous impossibilities, such as driver assistance within the vehicle and connecting vehicles with each other and with the roadway infrastructure network. It will be important for North Carolina to be flexible to structure its safety strategies and actions to accommodate new knowledge as it becomes available.

## Emphasis Area Goals

This emphasis area has two goals. The first goal is to improve the State's data and data systems in support of the SHSP goal to reduce fatalities and serious injuries on North Carolina's roadways. The second goal is to use the improved data to identify and address safety concerns and additional emphasis areas that emerge as the SHSP is implemented and the State moves toward the 2030 goal.

## Strategies and Supporting Actions

The following strategies have been established as priorities for North Carolina for the Emerging Issues and Data emphasis area. These include actions in support of the eight other Emphasis Area Action Plans. Listed below each strategy are several recommended actions to support it, as well as one or more North Carolina agencies identified as having a potentially significant role in its implementation and the current status of the action.

### Strategy 1

**Improve the quality and usefulness of crash data.**

Currently, crash data in North Carolina are reported in a combination of paper forms and electronic submittals. Approximately 70 percent of all crashes are reported electronically. By increasing the percentage of crashes reported electronically, the quality and usefulness of crash data will increase. Electronically submitted crash data do not require a staff member to code the information from a paper form, thus eliminating the data entry step and a potential source of errors. Additionally, the electronic submissions can be processed faster,

leading to shorter lag times between the occurrence of a crash and the availability of the associated crash data. An electronic crash report form can be updated more easily in the future when data fields are added or modified. In order to see an increase in electronic crash submissions, North Carolina needs to focus on improving the ease of use for the on-scene officer by streamlining the electronic submittal process, increasing the ability for automatic completion of data fields, and increasing training for officers.

Crash location is a crucial piece of information. Currently, most crashes are located using information recorded by the reporting officer, such as street names and distances from intersections. This leads to a potential for misreporting (e.g., an officer reports an incorrect street name, distance, or direction) or miscoding when the information is entered into the crash database. There is a need for a tool that would record accurate latitude and longitude coordinates and would integrate well with the electronic reporting systems used by the law enforcement agencies, improving the ease and accuracy of recording crash location. Such a tool would need to provide the ability for the responding officer to record accurate crash coordinates even if not physically present at the exact location of the crash.

*Supporting Actions*
1. Increase the percentage of crashes reported electronically.
*Potential Implementing Agencies:*
NCDMV, Law enforcement
*Status:* Underway

2. Improve the ease and accuracy of recording crash location.
*Potential Implementing Agencies:*
Law enforcement, NCDOT
*Status:* Planned

## Strategy 2

**Improve the completeness and accuracy of roadway inventory data.**

The proposed implementation language for MAP-21 requires a collection of fundamental data elements (FDE) on all public roads. The required elements will differ according to the functionality of the road, with lower-volume roads having a reduced set of required FDE. North Carolina will prepare for the implementation of this rule by continuing to increase information on the functionality of State and non-State roadways. This may involve improving the completeness of traffic volume information or determining the general function of the road in the local network (e.g., collector vs. subdivision road).

Related to the collection of the FDE, an effort is underway to develop a linear referencing system (LRS) for all public roads. The proposed implementing language in MAP-21 recognizes the benefit of having a LRS on all public roads—both State and non-State miles. While this is not a requirement, it states that "an all-public-roads LRS is a prerequisite to realizing the full benefits from collecting and using the Model Inventory of Roadway Elements (MIRE) FDE" (HSIP NPRM, 2014). Since 2013, North Carolina has been working toward a linear referencing system implemented on all public roads through the Road Operations and

Management Effort (ROME). This effort will continue to improve the completeness of the coverage on all public roads.

Exposure data, generally in the form of traffic volumes, is another important component of a complete and accurate roadway inventory. Knowing the types and number of users of the roadway system is important in many aspects of safety management. North Carolina will seek to improve data on roadway user exposure by improving the completeness of its data on the traffic volume of vehicles, pedestrians, bicyclists, commercial vehicles (large trucks), and motorcycles.

*Supporting Actions*

1. Prepare for a collection of fundamental data elements.
*Potential Implementing Agencies:* NCDOT
*Status:* Underway

2. Continue development of a linear referencing system (LRS) for all public roads.
*Potential Implementing Agencies:* NCDOT
*Status:* Underway

3. Improve data on roadway user exposure.
*Potential Implementing Agencies:* NCDOT
*Status:* Planned

## Strategy 3

**Improve driver record data.**

Driver education is required in North Carolina for anyone under 18 years of age and seeking a driver license. Approximately 92 percent of teens receive driver education (North Carolina Driver

Education Strategic Plan, 2012). Currently, the NCDMV driver record data does not contain information on whether the person received driver education or where they received it. The effectiveness of the driver education program could be tracked if this information were maintained in the driver record data. Additionally, tracking the particular location where the person received the training would allow the Driver Education Program to determine if particular programs or methods are more effective than others, which could in turn be used to support a call for increased funding for the proven methods.

### Supporting Actions

1. Collect and maintain data on driver education programs.
*Potential Implementing Agencies:*
NCDPI/Driver Education, NCDMV
*Status:* Needed

### Strategy 4

**Increase the State's ability to use existing traffic safety data.**

Many North Carolina agencies collect data relevant to their programs, such as data related to crashes, citations, driver records, and medical records. In order to make full use of these collected data, North Carolina will seek to improve the analytical ability of department staff and acquire, adopt, or develop new tools for analyzing these data. This may involve updating current data systems such as the Traffic Engineering and Accident Analysis System (TEAAS).

The ability to use existing data can be assisted by

concerted sharing of data among agencies. This strategy recognizes the work of the North Carolina Traffic Records Coordinating Committee (TRCC) and would support the goals stated in the North Carolina Traffic Safety Information Systems Strategic Plan 2013 to improve data sharing among the various agencies and transportation safety partners.

Taking the need to improve sharing a step further, there is the potential to link crash data with medical data. Therefore, an action in support of this strategy is to evaluate the value of linking medical and crash data. The proposed language for performance measures in MAP-21 recognizes the importance of accurate crash injury data. To that end, it recommends that by 2020 "serious injuries data is collected through and reported by a hospital records injury outcome reporting system that links injury outcomes from hospital inpatient and emergency discharge databases to crash reports" (National Performance Management Measures, 2014). An effort of this size would bring a sizeable cost, but the benefit of such an effort is unknown at this point. North Carolina will investigate this issue and determine the potential value of linking medical records and crash data in such a manner to guide any future steps on this topic.

Finally, exposing crash data trends and high crash locations to the driving public may help to increase driver awareness and reduce risky driver behaviors in North Carolina. This action will seek to increase public awareness of road safety through the use of the many different types of safety data that are currently collected by the State, the foremost of which is crash data. This

action may involve increased use of informational maps on the internet or in public media campaigns.  The campaigns could use data specific to a region or county to personalize the outreach effort in that area.

*Supporting Actions*

1.  Increase analytical tools and expertise.
*Potential Implementing Agencies:*
NCDOT, Law enforcement
*Status:* Needed

2.  Increase sharing of data between agencies.
*Potential Implementing Agencies:* TRCC
*Status:* Underway

3.  Evaluate the value of linking medical and crash data.
*Potential Implementing Agencies:* NCDMV, NCDOT
*Status:* Needed

4.  Expose crash data trends and high-crash locations to the driving public.
*Potential Implementing Agencies:* Various advocacy groups, NCDOT, NCDMV, Law enforcement
*Status:* Needed

## Strategy 5

**Accommodate new issues that emerge in the field of highway safety.**

The future of highway safety is bright with many potential advances.  North Carolina will make every effort to remain aware of emerging issues and will remain flexible to incorporate new ideas and resources into the safety programs of its various agencies.  Issues may emerge in the following categories:

- New knowledge on countermeasures or safety programs
- Technological advances, such as autonomous vehicles, increased in-vehicle technologies, and vehicle-infrastructure integration
- Alternative data sources for decision-making, such as onboard computers or naturalistic driving data
- Demographic changes

*Supporting Actions*

1.  As it emerges, embrace and support the Vision Zero, and look for ways to integrate it with the SHSP.
*Potential Implementing Agencies:* NCDOT
*Status:* Needed

2.  Remain aware of emerging issues and address issues accordingly.
*Potential Implementing Agencies:* NCDOT
*Status:* Needed

## Measuring Performance

The progress toward the goals of this emphasis area is measured by the number of actions and strategies implemented.

## Working Group Members

The working group for this emphasis area includes the following representatives from seven agencies committed to achieving the goals of this Action Plan:

- Ike Avery, North Carolina Conference of District Attorneys
- Mike Bruff, North Carolina Department of Transportation

- Julian Council, North Carolina Division of Motor Vehicles
- Greg Ferrara, NCSU Institute for Transportation Research and Education
- Daniel Findley, NCSU Institute for Transportation Research and Education
- Reginald Flythe, North Carolina Department of Public Instruction
- David Harkey, UNC Highway Safety Research Center
- Eric Jackson, North Carolina State Highway Patrol
- Brian Mayhew, North Carolina Department of Transportation
- Chris Oliver, North Carolina Department of Transportation
- Terry Robinson, North Carolina State Highway Patrol

## Supporting Material

- Highway Safety Improvement Program (HSIP), Notice of Proposed Rulemaking (NPRM), Department of Transportation, Federal Highway Administration, 23 CFR Part 924, [Docket No. FHWA–2013–0019], RIN 2125–AF56, March 28, 2014. Accessed 6/17/14 at http://1.usa.gov/O4TTs6
- National Performance Management Measures; Highway Safety Improvement Program, Notice of Proposed Rulemaking (NPRM), Department of Transportation, Federal Highway Administration, 23 CFR Part 490, [Docket No. FHWA–2013–0020], RIN 2125–AF49, March 11, 2014. Accessed 6/17/14 at http://1.usa.gov/1kaOScZ

- North Carolina Driver Education Strategic Plan, Prepared By The Driver Education Advisory Committee, State Board of Education, and Department of Public Instruction, June 2012. Accessed 6/17/14 at http://bit.ly/1y8yTXi