

INTRODUCTION

The purpose of the North Carolina Highway Safety Improvement Program (HSIP) is to provide a continuous and systematic procedure that identifies and reviews specific traffic safety concerns throughout the state. Within these areas are determined the potentially hazardous (PH) locations that are possibly deficient. The ultimate goal of the HSIP process is to reduce the number of traffic crashes, injuries, and fatalities by reducing the potential for these incidents on public roadways. The Traffic Safety Unit continuously strives to improve the identification of relevant traffic safety issues, minimum warranting criteria, and the location selection process.

The 2009 HSIP is a preliminary list of locations intended to be primarily utilized by engineers within the Transportation Mobility and Safety Division as well as NCDOT Division Operations personnel. However, other interested parties may also use the information presented here. These locations are divided into three categories: intersections, sections, and bicycle/pedestrian intersections. We encourage anyone using this information to contact us with any questions about the safety program.

It is important to understand what this preliminary list of statewide locations signifies. The following are a few key points regarding the 2009 HSIP that may help non-primary users:

- Each location listed has been flagged as potentially exceeding at least one safety warrant. This list is not based on frequency alone and this program is not an effort to list locations around the state that experience the highest number of crashes. Basically, each location listed has a targeted pattern of crashes that can be identified, analyzed, investigated, and recommended for appropriate countermeasures where applicable.
- Locations are weighted and prioritized using many factors. These factors are used to rank locations for analysis and investigation in a particular category.
- This list is not an effective “Top Ten Most Dangerous Locations in the State” type of list. Any effort to measure “danger” is subjective and the HSIP is an effort to remove subjectiveness from the selection of locations that may need to be analyzed and investigated.

The Regional Traffic Engineers exclude locations based on previous recommendations, current or scheduled improvements, on-going investigations, or any other project or study that would directly address the location’s warrant identified safety issue(s). The excluded locations are listed separately by category.

2009 HSIP OVERVIEW

After significant changes in 2005 and minor changes in 2007, several significant modifications and tweaks were made for the 2009 cycle of the HSIP. These changes are:

Intersection Warrants:

- The weighting factor formulas have been revised.
- I-2, the Last Year Intersection Warrant, the minimum percentage of crashes occurring in the last year was dropped from 38% to 35%.
- I-3, the Frequency with a Severity Index Minimum Warrant, the minimum severity index was dropped from 7.0 to 6.0.
- I-4, the Night Location Warrant, the “without streetlight” condition has been dropped in favor of all night crashes. Also, there is one set of thresholds instead of two.
- I-5, the Chronic Warrant Pattern, the rear end pattern has been dropped. The rear end warrant tended to identify locations with congestion and not areas that were correctable with typical safety countermeasures.

Section Warrants:

- Separate warrants have been developed for freeway and non-freeway sections. When comparing freeway facilities to non-freeway facilities there is a significant difference in travel patterns, highway design and traffic operations thus there is usually a significant difference in crash patterns.
- The “without streetlight” condition has been modified to include all night crashes.

Bicycle-Pedestrian Intersection Warrant:

- The four warrants for pedestrian intersection and four warrants for bicycle intersections have been simplified into one warrant for pedestrian and bicycle crashes, combined.

Bridge Warrant:

- This warrant has been removed for the 2009 HSIP cycle. The Traffic Safety Unit is researching alternatives to this warrant.

Total potentially hazardous locations identified:

- 1777 potentially hazardous intersection locations were identified.
- 685 potentially hazardous section locations were identified.
- 79 potentially hazardous bicycle/pedestrian intersection locations were identified.

This publication consists of only the top 400 and 200 potentially hazardous locations in the intersection and section categories, respectively. It contains all the bicycle/pedestrian intersection locations. It also contains the excluded locations by category type.

SAFETY ANALYSES

Detailed crash analyses based on the most recent crash data are completed for locations prior to field investigation by the Regional Traffic Engineer's office. The analyses will be conducted using the following guidelines.

All Analyses

- The analysis period will be the most recent five or ten years of available data based on the warrant criteria.
- The older PH number will be used if the location has been previously identified.
- A warrant worksheet will be included.
- Collision diagrams and available signal plans will be included.
- Copies of all crashes will be sent electronically with each analysis and will not be kept at the central office.
- Regional staff will be notified electronically of locations that do not have a significant, correctable crash pattern.

Intersection Analyses

- The Y-line will be 150 feet.
- All loop situations will be separated and analyzed on an individual basis.
- Interchanges will be broken out with each intersection of the interchange being analyzed separately. However, if the situation necessitates that the location be treated as one spot (i.e. - night crashes spread throughout the interchange) then it will be analyzed as a whole.

Section Analyses

- The Y-line will be 0 feet.
- The endpoints of the locations will be adjusted to the most precise section possible. However, separate locations within close proximity to each other may be incorporated into a single location.
- Animal crashes will be deleted from the analysis.

Bicycle/Pedestrian Analyses

- The Y-line will be 50 feet for all non-motorist locations
- Only bicycle and pedestrian crashes will be analyzed and included in the final analysis statistics (unless otherwise requested).

FIELD RECOMMENDATIONS

The TSSMS is required to regularly evaluate the HSIP with regards to the development and evaluation of warrant criteria, the PH location selection process, and the development and effectiveness of treatments. This evaluation will provide a gauge for overall program effectiveness and also provide insight to any necessary modifications. The Safety Evaluation Group will evaluate the effectiveness of treatments in order to develop crash modification factors. In order to accomplish this, the Regional Traffic Engineer should return the following information to the HSIPG for every PH location that is investigated (even if a project is not developed for spot safety or hazard elimination funding):

- Location information (county, city and description) including precise endpoints for bridge and section locations.
- PH number and HSIPG analysis log number. Include TEB File Number on all correspondence.
- Overview narrative of the location (i.e. – traffic control, configuration, immediate land use, etc.). A condition diagram can be substituted in lieu of a narrative.
- Historical narrative and other pertinent information related to the location (i.e. – recent improvements, zoning changes, crash patterns, collision diagram, complaints, etc.). If any improvements were completed after January 1, 1995, we need the date the project was completed, what was involved, and the type of project (i.e., spot safety, maintenance, etc.).
- Signal phasing (protected only, protected-permitted, etc.).
- Photographs (if possible).
- Description of any recommended treatment(s). Keep in mind that recommendations for bicycle and pedestrian locations may not necessarily conform to traditional traffic engineering improvements and that a wider perspective of treatments may be necessary.
- Date construction began (or let date) and end date of construction.
- Completed field investigation worksheets (if a bicycle and/or pedestrian location).
- Documentation for no recommendations.