3 CRASH REDUCTION COUNTERMEASURES

A key aspect of reviewing crash data and patterns is to focus on determining the possible causes of the identified crash patterns and then provide alternative countermeasures to mitigate the crash patterns. Crash reduction factors (CRFs) represent the proportion of crashes that are expected to be eliminated from a site as a result of implementing a specific spot improvement. CRFs are used to identify and prioritize the most effective safety improvement measures and prioritize and allocate available resources optimally for a highway safety project. Crash reduction factors, which are based on previous research and field studies of before and after crash statistics, need to be revised and updated periodically to reflect the most current knowledge regarding the effectiveness of various highway improvement measures.

3.1 Overview of Crash Reduction Factors

The CRF for a particular countermeasure is based on numerous federal and state studies and research of before and after conditions for high crash locations once countermeasures have been implemented. This data analysis has been performed over many years and the CRFs are updated regularly as more studies and research are conducted and as new countermeasures are developed with improving technologies and designs.

3.2 ODOT Crash Information

3.2.1 Ohio Highway Safety Plan

The state of Ohio has developed a state highway safety plan that is titled, Ohio’s Road Map to Fewer Fatalities, which is a comprehensive highway safety plan that was developed by safety advocates and citizens throughout Ohio. The highway safety plan is a tool that outlines the greatest threats to highway safety that have been identified in Ohio via detailed analyses and it identifies new strategies and countermeasures designed to lower the number of crashes, injuries, and deaths that occur each year on Ohio roadways. Through extensive data analysis, five key emphasis areas and 19 targets were identified and addressed in the state safety plan. The emphasis areas are outlined below.

3.2.2 Emphasis Areas

The emphasis areas from Ohio’s Road Map to Fewer Fatalities were selected based on crash data that showed a high number of fatalities and serious injuries or troubling trends that warranted additional attention. The responsibility of roadway safety is shared by motorists, government agencies, elected officials, and safety advocates. Given this, it is important to know the identified emphasis areas that the state safety plan has identified and to keep these in mind locally as safety projects and countermeasures are developed to improve roadway safety in Lucas and Wood counties to help achieve the goals of the safety plan. The following list displays the key emphasis areas and targets taken directly from the State of Ohio’s highway safety plan:
Emphasis Area I – Data and Support Systems

Targets
- Timely Data
- Reliable Data
- Comprehensive Data
- Integrated Data and Analysis Systems

Emphasis Area II – Serious Crash Types

Targets
- Fixed Object
- Head-On
- Cross Median
- Highway Intersection/Railroad Crossings

Emphasis Area III – High-Risk Behaviors/Drivers

Targets
- Impaired by Alcohol
- Occupant Protection Devices – Non-use and Misuse
- Young Driver – 15 to 25
- Distracted or Fatigued
- Aggressive Driving
- Older Driver – 65 and Older

Emphasis Area IV – Special Vehicles/Roadway Users

Targets
- Motor Carriers
- Motorcycles
- Pedestrians/Bicycles

Emphasis Area V – Incident and Congestion Related Crashes

Targets
- Rear End crashes
- Work Zone crashes

For each of the emphasis areas and targets, consideration was given to strategies in the engineering, enforcement, public information and education, and emergency medical service areas. Primarily, strategies that held the greatest potential to impact the crash problem are noted.

3.2.3 Countermeasure Strategies

The development of appropriate crash countermeasures for identified high crash locations is a very dynamic process since each location has unique roadway conditions, physical attributes, traffic volumes/operations, differing crash patterns, and frequency. All of these factors must be considered in developing conceptual safety improvements for a specific location experiencing high crash occurrences. Ideally, a detailed engineering safety study is needed to evaluate a location to develop appropriate countermeasures. The Safety Report 2009-11 will provide a general overview of each identified top high crash intersection and section locations and provide some general countermeasures to be
considered; however this is a first tier review and in order for a local agency to pursue safety funds, a more detailed engineering safety study will be required. To assist agencies and safety advocates, this document provides research and countermeasure literature in Appendix A of this report.

### 3.2.4 State Average Crash Statistics and Rates

ODOT annually develops statewide crash statistics and trends as well as crash rate averages to provide a reference as to how a particular high crash location compares to the statewide averages. The graphic in Appendix B summarizes 2007-2011 state average percentages for various common crash statistics that allows for comparisons to be made between specific high crash locations and the state averages to determine how the site compares to other similar sites.

In addition to the crash statistics, it is also important to compare crash rates of specific locations with the state averages of similar facilities. ODOT has developed a wide range of crash rates for various types of facilities based on characteristics such as number of lanes, divided/undivided roadway, urban/rural, area, and functional class.

### 3.3 MDOT Crash Information

#### 3.3.1 Michigan Strategic Highway Safety Plan

In 2012, a group of traffic safety experts updated the state Strategic Highway Safety Plan (SHSP). Organized by the governor's Traffic Safety Advisory Commission, the group included representatives of state agencies, local agencies, and other safety partners. They identified 11 critical issues the state must address to meet its roadway safety goal.

**Critical Issues**

- Impaired Driving
- Commercial Motor Vehicle Safety
- Distracted Driving
- Drivers Ages 24 and Younger
- Senior Mobility and Safety
- Traffic Incident Management
- Traffic Safety Engineering
- Motorcycle Safety
- Occupant Protection
- Pedestrian and Bicycle Safety
- Traffic Records and Information Systems