



Project Number

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Validation and Application of Highway Safety Manual (HSM) (Part D) and Developing Florida Crash Modification Factors Manual, Phase 2

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Current Situation

The AASHTO Highway Safety Manual (HSM) helps transportation professionals quantify and evaluate the safety performance of the roadway system. HSM Part D focuses on safety countermeasures (treatments) for many types of roadways, including roadway segments, intersections, interchanges, freeways, and special facilities. The numbers that express the effectiveness of safety countermeasures are called crash modification factors (CMFs). To guide the selection of countermeasures, CMFs must be tested and validated for each locale in the nation.

Research Objectives

University of Central Florida researchers developed CMFs for countermeasures used in Florida for various road types, crash types, and severity levels, and they evaluated differences between these Florida-specific CMFs and the CMFs in the HSM. The comparison provided a basis for recommending when HSM CMFs can be applied to Florida and when new, Florida-specific CMFs are needed.

Project Activities

Some examples of safety treatments for roadway segments include widening shoulders on rural two-lane roadways, increasing distance to roadside trees and poles on rural multilane highways, and increasing bike lane width on urban arterials. For intersections, some of the studied treatments were adding a right or left turn lane, changes of median width on a signalized intersection, and installation of retroreflective border back plates on traffic signals. One example of a treatment for a special facility was converting traditional and hybrid toll plazas to all electronic toll collection.

As a single numerical value, a CMF represents the average safety effect of a particular treatment for all treated sites. The researchers expanded this concept by developing crash modification functions (CMFunctions) that more precisely define a CMF for a specific combination of treatment and treated area.

The researchers found that their Florida-specific CMFs were generally statistically significant and represented intuitive safety effects. Most Florida-specific CMFs not found in the HSM showed significant reductions in crash frequencies. The researchers recommended using Florida-specific CMFs whenever they were statistically significant; in other cases, HSM CMFs should be used. All Florida-specific CMFs were compiled into a manual, which is included in the final report.

Project Benefits

More accurate and specific CMFs allow the design of safer roadways, leading to further reductions in crashes on Florida's roads.

For more information, please see dot.state.fl.us/research-center



A proven safety countermeasure is the retroreflective border (right) that helps a signal stand out from its background, especially at night, dusk, and dawn.