

Florida Department of Transportation Research

Development and Calibration of Highway Safety Manual Equations for Florida Conditions

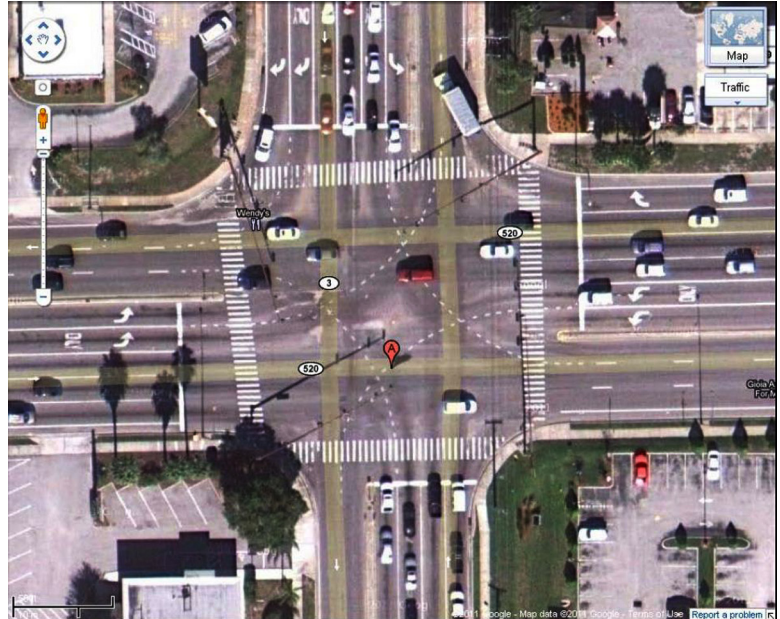
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Standardization of design and analytical tools has been a major advancement in roadway design. An important example is the Highway Safety Manual (HSM) from the American Association of State Transportation Officials (AASHTO). HSM provides statistically valid, research-based tools and methods for quantifying and estimating roadway crash rates resulting from decisions made in planning, design, operations, and maintenance. The Federal Highway Administration states that, before publication of the HSM, “there were no widely accepted tools... to quantify the potential for reductions in crash frequency and severity.... As a result, safety considerations carried little weight in the project development process....”

HSM models for safety prediction methodologies were developed with data from highway agencies in six states, the closest to Florida being North Carolina and Texas. However, crash rates are strongly influenced by local factors such as geography and demographics. To accurately interpret Florida crash rate trends, the models underlying the HSM methods must be calibrated to local conditions.

In this project, researchers from the University of Florida developed calibration factors for segment- and intersection-level safety performance functions (SPF), equations that relate crash rates to site characteristics, such as traffic volume or roadway geometry. SPFs have been derived for an extensive series of roadway segment or intersection types, called base conditions. Starting with base conditions appropriate to Florida settings, the researchers calibrated SPFs to specific sites using crash modification factors (CMF) based on local data.

Calibration factors were based on Florida data taken in 2005 through 2008, but to keep the HSM



The crash rate associated with an intersection, such as the one pictured above, is based on its general type and on specific characteristics, such as nearby driveways, bus stops, and businesses. Planners can use the HSM models calibrated for this specific intersection to test designs that could make this intersection safer.

models current, calibrations should be performed every year to understand current trends and to predict future ones. Researchers explored a full range of conditions that can influence the calibration, including facility type, collision type, and the presence of bike lanes. The data available for these calculations varied from place to place, so the researchers conducted sensitivity analyses to evaluate their assumptions in the use of certain data.

The report includes recommendations for further refinements of the HSM calibration procedure.

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For more information, visit <http://www.dot.state.fl.us/research-center>