

Prioritization of Interchanges and Ramps based on Potential for Safety Improvements

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ABSTRACT

Road safety management has been a growing practice within jurisdictions. These jurisdictions are searching for methods and processes that will assist them in identifying road sections and road features that may be modified and enhanced by engineering measures to reduce the frequency and severity of future collisions. The Ontario Ministry of Transportation (MTO) in Canada has recognized the need for the application of more advanced methodologies in the quantification of their highway network's safety performance and the identification of sites with the greatest potential for safety improvements. This paper focuses on the process and the findings of a successfully completed comprehensive assignment for which statistical models (Safety Performance Functions (SPFs) for interchanges and ramps were developed and calibrated. Databases of historical traffic, collision and road data were populated and validated for the development of the SPFs. An automated procedure was developed to screen the safety performance of all interchanges and ramps within the jurisdiction and rank them from the highest to the lowest values of the Potential for Safety Improvement indexes (PSI_{index}). A PSI_{index} is defined as the sum of the three PSOs (for Fatal, Injury and Property-damage-only collisions), each multiplied by a collision severity cost weight. The application of these models, or functions, will assist the Ministry in optimizing its capital improvement program by reducing the number of false positive and negative sites that are identified when the identification of sites for investigation is based on collision rates and counts.