

Implementation of a New Methodology for Identification and Ranking of Sites with Potential for Safety Improvements

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ABSTRACT

The paper will present the results of findings of the study recently completed, for the Region of Halton, that implemented a new methodology for identification and ranking of sites with potential for safety improvements (accident reduction). A systematic safety program commences with a network screening process to rank road segments and intersections based on their potential for safety improvement, followed by a diagnostic process and selection of countermeasures, incorporating safety-motivated projects into a regional priority analysis and capital planning process.

The process for identifying sites “with promise” (sites with potential for safety improvement) for a detailed safety investigation demands efficiency because resources can be wasted on sites that are incorrectly identified as unsafe and sites that are truly unsafe can go untreated if not identified in this process. Conventional techniques utilizing collision counts and/or rates, often in a statistical quality control framework, are now known to have difficulties in identifying sites with promise. These difficulties are due to the potential bias due to the regression-to-the-mean phenomenon in which sites with a randomly high collision count can be wrongly identified as being hazardous and vice versa.

To overcome the difficulties with the conventional techniques, an approach based on safety performance functions (*SPFs*) has been developed.

The network screening process is based on information contained in Halton’s Accident Database and two additional data files created for this purpose: annual traffic volumes estimated on the basis of traffic counts by the Region, and a road inventory data for road segments and intersections. This study comprised 1995-2000 data collected and recorded by the Region.

The network screening process is an initial identification of sites with potential for safety improvement. An automated tool for the screening of safety performance of regional road network was developed for the Region. The ranking index is named PSI_{index} and the output will list locations in a descending order of PSI_{index} . PSI_{index} is defined as the sum of the two $PSIs$ (for Fatal /Injury collisions and Property-damage-only), each multiplied by the collision severity cost weight.