ABSTRACT

Roadway safety is a key element of transportation. Identifying dangerous situations on roadways, determining what factors affect safety, and looking for appropriate solutions to ultimately improve overall roadway safety are essential tasks of transportation professionals.

Road safety audits and reviews are strategies to improve road safety by minimizing the risk and severity of crashes. The main objective is to identify features of the roadway environment that could be potentially dangerous to road users and to ensure that measures to eliminate or reduce the problems are fully considered. The process could be implemented to new or existing roadways. When the process is applied to existing roads is given the name of road safety review.

One of the most critical factors in roadway safety is speed gradient. Speeding occurs nearly every day on almost every road, however, on certain roads, speeding has more severe consequences than others. Despite their low traffic volumes, almost half of all speeding fatalities occur on local and collector roads.

This research provides a methodology to conduct road safety reviews on existing local roads with documented speeding problems. The procedure is broken down in three parts: the office review, the field review, and the final report.

The office review primarily consists of a comprehensive site description and a complete crash data analysis. The crash analysis is undertaken to help reveal high crash locations and definable crash patterns that may be corrected through changes in roadway geometry, speed limits or the use of traffic control devices.

The field review includes a road survey, conducted with the aid of recommended manuals and provided checklists. In the road survey, the engineer must observe and record data on a variety of traffic-related categories including roadway characteristics, geometry, speed limits, sight distance, signing, and other issues. The purpose of this survey is to help identifying any potential safety issues. To complete the road survey, speed data is collected and analyzed.

The final report summarizes the results of both the office and the field review. The main task of the road safety review report is to identify the aspects of the roadway that may involve hazard and to make recommendations about corrective actions. Each finding in the road safety review is categorized into a level a risk to give an idea of the severity of the issue and the emergency of the solution.

The road safety review process was applied to six roadways in the town of Natick, Massachusetts. The selected roadways included: South Main Street, Glen Street, Walnut Street, Pine Street, Hartford Street, and Union Street.

In the office review for all six streets, the crash reports were obtained from the Natick Police Records Department and comprised the period from 1998 to 2003. The field review was completed by field visits, checklists, photographs, and videotapes. The speed data was collected using pneumatic road tubes and traffic classifiers during 72 hours and later analyzed using statistical software.

The implementation of the procedure was found successful and the results obtained were consistent. Findings for South Main Street, Pine Street, and Union Street presented levels of risk medium and low, therefore these streets could be considered not dangerous. On Hartford Street and on Glen Street, some issues were classified into high level of risk, which means that they should be corrected. Finally, on Walnut Street, a dangerous intersection with visibility issues was identified and considered an intolerable risk, and so it must be corrected.