

Update and Enhancement of the Oregon Dept. of Transportation (ODOT)'s Crash Reduction Factors

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Identification and implementation of appropriate safety countermeasures are key to highway safety improvement planning. A well-organized and comprehensive list of accurate, up-to-date, and well-documented crash reduction factors is critical to this effort.

Objectives

- Provide up-to-date, comprehensive listing of crash reduction factors (CRFs) for use by ODOT engineers and planners
- Create CRF database and interactive web site
- Document key considerations associated with CRFs to better inform engineers and planners selecting countermeasures
- Clearly document methodology and sources to enable future updates to database by ODOT

Problem Statement

The Oregon Department of Transportation (ODOT) has used its current list of safety improvement countermeasures and associated crash reduction factors (CRFs) since the early 1990's. The current list lacks the documentation necessary for individual project engineers to make judgments about the applicability of a given countermeasure to a particular situation. In addition, the countermeasure descriptions do not always make clear the methods, resources, or statistical reliability of analyses used to develop the CRFs.

Therefore, a need was recognized to compile and present countermeasures in a way that would make it far simpler for ODOT engineers and planners to search for countermeasures applicable to specific situations and to have a greater degree of confidence in the CRFs described.

Research Description

This research effort began with a complete listing of crash reduction factors that built upon ODOT's original list by incorporating lists from other states and recent literature. A literature review and synthesis were subsequently performed, resulting in a list of over 200 countermeasures that was eventually refined and condensed to eliminate redundancies and impertinencies.

Each countermeasure was assigned multiple categories in order to render the web-based search component more dynamic. Categories include countermeasure type, appropriate setting (urban vs. rural), crash types addressed, causal factors, and roadway location (roadway section vs. intersection).

A detailed literature review was conducted for each countermeasure, resulting in summaries of reviewed studies, syntheses of the best available knowledge and, when possible, estimated CRFs. Based on this review, countermeasures were divided into three categories: those with robust research and generally reliable CRFs, those with limited research and CRFs requiring additional scrutiny, and those with discussion only and no reported CRFs.

Finally, all of the above information was entered into a database from which the project web site is populated. This allows for easy updating in the event that new research is conducted or modifications are required.

The image shows three sample pages from the CRF database. Each page is a table with columns for Countermeasure, CRF, and other details. The tables are organized into sections: Introduction, Countermeasures, and References. The first page shows a list of countermeasures with their corresponding CRF values. The second page shows a list of countermeasures with their corresponding CRF values. The third page shows a list of countermeasures with their corresponding CRF values.



Key Findings

- There is wide variation in the reliability of safety countermeasure studies and the CRFs reported within.
- Relatively few countermeasures have been studied extensively and conclusively (27) and majority (45) of countermeasures are in need of detailed research to explicitly quantify their effectiveness.
- Countermeasures are often used in combination, making precise study of any one countermeasure more difficult.
- A interactive web database should encourage the timely update of crash reduction factors as more research becomes available.

Interactive Web Site Home Page

Recommendations and Considerations

- The usefulness of the countermeasure and CRF listing should be used in safety benefit cost analysis and for generating ideas of possible safety improvements at specific circumstances.
- Actual results of applying countermeasures should be expected to vary according to the specific circumstances of their application.
- It is important to note that most CRF data should be used only as a guide; professional judgment in particular situations will continue to play a major role in decisions.
- Given trends in current and future federal-sponsored research work, ODOT should consider the switch to accident modification factors (AMF) rather than CRFs.

Interactive Web Site Query Results

Road Character	Crash Type	Fatal	Injury	PDO	All Crash Severity
Both	Fixed Object	64%	47%	-	-

Interactive Web Site Countermeasure Page

Contacts

RESEARCH SPONSOR

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