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TECHNOLOGY TRANSFER PROGRAM

JUST THE FACTS

# Developing Louisiana Crash Reduction Factors

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State

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SPECIAL POINTS OF INTEREST:

- Problem Addressed
- Objectives of Research
- Methodology Used
- Implementation Potential

## PROBLEM

Approximately 1,000 people lose their lives each year in traffic crashes on Louisiana's roadways, and 50,000 are injured. Traffic crashes cost the citizens of Louisiana $6.03 billion each year, which accounts for about $2,104 for every licensed driver in Louisiana. The Louisiana traffic fatality rate in 2006 was 2.16, while the nation average was 1.41. The lowest rate, 0.78, was reported for Massachusetts. In fact, the traffic fatality rate in Louisiana has been higher than the national average for the past several years.

Facing such an unacceptable high number of crashes, the Louisiana Department of Transportation and Development (LADOTD) has developed the Highway Safety Improvement Program (HSIP) to reduce the number of crashes on Louisiana roadways. Developing Louisiana crash reduction factors (CRFs) is one of the actions proposed by the HSIP. Crash reduction factors are used to identify and prioritize the most effective safety improvement measures. The estimated economic benefits depend on expected crash reductions from each countermeasure. CRFs are used by many states as a tool to evaluate cost-benefit relationships between various roadway improvements and their effectiveness in reducing crashes and/or reducing the severity of those crashes. LADOTD is currently using CRFs developed by Federal Highway Administration (FHWA) titled "Desktop Reference for Crash Reduction Factors" dated September 2007.

It has been recognized that there are variations from state to state in crash countermeasures used as well as the quality and sources of research used to determine CRF. Due to the difference in roadway user behavior, weather pattern, traffic operation environment, data recording practice, and traffic regulations, travelers' reactions to or the effectiveness of a particular crash countermeasure often varies from location to location. Furthermore, not all CRFs listed in FHWA desktop references clearly relate to particular situations

in Louisiana. For instance, there is no CRF for using chevrons, an inexpensive measure for horizontal curves on rural 2-lane highways. This countermeasure has been used successfully by engineers in the state as a way to reduce the number of curve crashes. Several CRFs for flatter horizontal curves in desktop references may not be practical, considering the cost involved. Therefore, there is a need to compile and present crash countermeasures in a way that would make it easier for LADOTD engineers and planners to apply CRFs for any given situation in the state.

## OBJECTIVES

The primary goal of this research is to develop and document a list of CRFs to be used by LADOTD. Particularly, this research will document the state-of-the-practice in CFR development, determine the CRFs to be developed for Louisiana, develop CFRs with available information under the budgetary constraint, and develop a web-based tool listing published CFRs and their development information.

## METHODOLOGY

Methodological issues are related to how a CRF is derived. Only properly designed before-and-after or cross-sectional studies produce the best CRF and accident modification factor (AMF) estimates. A number of problems have been identified with traditional before-and-after studies such as failure to separate safety effects of other changes, failure to account for the regression-to-the-mean effect, small sample sizes, combination of several countermeasures, and the use of unsuitable comparison groups. Suggested analysis procedures are from a highly regarded book in highway safety evaluation by Ezra Hauer.

## IMPLEMENTATION POTENTIAL

CRFs developed and documented by this project will be programmed in a web-based interactive tool for use by LADOTD and can serve as an important element of the state highway safety management system.

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