



RESEARCH PROJECT CAPSULE [19-4SA]

January 2020

TECHNOLOGY TRANSFER PROGRAM

Impact of Centerline Rumble Strips and Shoulder Rumble Strips on all Roadway Departure Crashes in Louisiana Two-Lane Highways

JUST THE FACTS:

Start Date:

July 1, 2019

Duration:

18 months

End Date:

December 31, 2020

Funding:

SPR: TT-Fed/TT-Reg

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Sponsored jointly by the Louisiana
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POINTS OF INTEREST:

Problem Addressed / Objective of
Research / Methodology Used /
Implementation Potential

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PROBLEM

The Federal Highway Administration (FHWA) defines a roadway departure crash as one that occurs after a vehicle crosses an edge line, centerline, or otherwise leaves the roadway. Reducing the likelihood of roadway departure crashes is possible through countermeasures that provide visual, auditory, and/or vibratory warnings, such as centerline rumble strips (CLRS) and shoulder rumble strips (SRS).

According to Louisiana crash data, for the 10-year period from 2007 through 2016, 29.3 percent of all state highway crashes were roadway departure crashes. During the same time period, 64 percent of total fatal crashes on state highways were reported as roadway departure crashes. To reach the goal of Destination Zero Deaths, the state must continuously implement effective crash countermeasures.

OBJECTIVE

The objective of this project is to evaluate the safety effectiveness and benefit-cost ratio of CLRS and SRS on two-lane highways in the Louisiana Department of Transportation and Development (DOTD) system.

METHODOLOGY

Researchers will collect current information regarding safety effectiveness of rumble strips and review implementation policies from other states. Results will be summarized and included in the final report.

The first task of this project is to identify where and when rumble strips were installed on two-lane state highways. Each site may be categorized as CLRS, SRS, or both. Having a sufficient sample size for each category is important for the analysis.

A database of roadway attributes and crash characteristics for each site will be developed. The information and details listed in the current state crash database will govern the accuracy of this evaluation. It is anticipated that researchers will use four crash attributes for the evaluation: manner of collision, lane departure, roadway departure, and first harmful event.

It is important to note that the Louisiana crash data includes both roadway departure and lane departure as attributes. Conceptually speaking, there is a difference between these two attributes on two-lane roadways. Lane departures to the right typically lead to roadway departures, but lane departures to the left often lead to head-on or side-swipe opposite direction collisions that may not result in roadway departure.

Based on limited exploration of the crash database for a single year (2015), it appears that there are some problems associated with misunderstanding or miscoding of attributes. A comprehensive investigation of database accuracy is beyond the scope of this project. Since manner of collision is directly retrieved from the actual crash report, it provides the most reliable database information for this analysis.

Researchers will conduct a safety evaluation using a combination of analyses: before-after, cross-sectional, and crash trend. Analysis of change in total crashes by severity level and targeted type before and after installation of crash countermeasure will be performed. Two levels of analysis are anticipated: aggregated analysis covering all identified highway segments and more detailed analysis for selected segments.

To demonstrate the financial justification or feasibility of rumble strips, an analysis of benefits and costs will be conducted. Separate estimation of benefit/cost ratio will be provided for SRS, CLRS, and combination of both.

IMPLEMENTATION POTENTIAL

To continually enhance the safety of Louisiana's two-lane highways, it is critical to have a sustainable plan for reducing roadway- and lane-departure crashes. The results of this project will guide the DOTD plan for SRS and CLRS implementation.