

JUST THE FACTS

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FHWA and Safety

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Safety Improvement from Edge Lines of Rural Two-Lane Highways

PROBLEM

The study entitled, "Impact of Edge Lines on Safety of Rural Two-Lane Highways," completed in 2005 for LADOTD, has basically concluded that:

- With edge lines, centralization of vehicles' position is more apparent during nighttime, which reduces the risk of ROR and head-on collisions;
- Edge line markings generally cause drivers to operate their vehicles away from the road edge, irrespective of the roadway alignment;
- Magnitude of the impact of edge line markings is influenced by roadway width, operating speed, the time of the day, frequency of heavy vehicles, pavement condition, roadway alignment, and traffic from the opposite direction.

These conclusions were drawn based on the analysis of vehicular lateral position data collected from 10 sites on

narrow, rural two-lane highways in Louisiana. While recognizing the safety benefits of having edge lines on narrow rural two-lane highways, it is clear that implementing pavement edge lines on all these highways is not a trivial task; it requires significant resources from LADOTD. More than 40% of rural two-lane highways in Louisiana have pavement width (excluding shoulders) less than 22 feet. These narrow highways, as shown in the following figure, are not required to have edge line according to the current LADOTD policy.

Considering that the 41% of rural two-lane highways only carry about 18% of total VMT, and taking into account limited resources at LADOTD, first choosing segments with higher crash frequency, particularly the higher ROR crash frequency, for edge line implementation may be cost effective. The effectiveness of pavement edge lines will then be analyzed at the sites to develop crash reduction factors.

SPECIAL POINTS OF INTEREST:

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



Figure 1. Two segments of Narrow Rural 2-lane highway in Louisiana

OBJECTIVES

The goal of this project is to improve the safety of narrow, rural two-lane highways in Louisiana. Specifically, the research team will:

- Identify the segments that will benefit most from implementing the pavement edge line;
- Implement pavement edge lines at selected locations;
- Conduct the before-and-after study of the locations to estimate the crash reduction factors.

METHODOLOGY

The method of procedure will consist of the following tasks:

Overview: The overview proposed in this task will focus on the most recent information on pavement edge lines.

Development of the site identification methods: Crash frequency and rate are two widely used black-spot identification methods. These methods consider not only crash frequency and rate, but also level of severity, economical cost, and expected crash level.

Ranking the most promising segments with the selected methods— With selected methods, the research team will analyze the crash data to rank the segments. The last five years of crash data (2002-2006) should be used, since the accuracy of the data improves with each year.

Implementation of edge lines: The research team will coordinate with each District office to schedule the edge line implementations.

Before and after crash analysis of cost/benefit analysis— After 6-12 months of edge line implementation, the research team should start collecting the traffic crash data at all the selected sites.

Final Report— A final project report will be submitted to LADOTD and will include the following:

1. The description of the selection process, including criteria;
2. Benefit and cost analysis for each selected highway segment;
3. The crash reduction factors based on the before and after crash analysis.

IMPLEMENTATION POTENTIAL

Louisiana has about 5,600 miles of narrow, rural two-lane highways. Reducing crash frequency and alleviating crash severity on this type of highway calls for cost-effective remedies. This project should offer such remedial actions. The recommendations will be made at the end of the project based on the analysis results and should help LADOTD's future plan of improving the safety of rural two-lane highways.