RESEARCH ADMINISTRATION
Bureau of Field Services
Michigan Department of Transportation

Research Spotlight

Project Information

REPORT NAME: Improving Driver Safety with Behavioral Countermeasures

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COST SHARING: 20% MDOT, 80% FHWA through the SPR, Part II, Program

MDOT Project Manager

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Changing behavior to improve driver safety

Today's roadways are safer than ever, but safety professionals acknowledge that more work is needed to continue improving driver safety and reducing motor vehicle crashes. In this project, researchers examined a wide range of behavior-related measures designed to improve driver safety, with a focus on identifying the measures that are most likely to be effective in Michigan.

Researchers collected data for a pilot study on construction zone design, using Central Michigan University's AAA Michigan driving simulator.

Problem

Researchers have long been interested in identifying ways to make drivers safer on the road. A wealth of information is available both nationally and at the state level, documenting practices aimed at changing driver behavior such as new laws, enhanced enforcement, public education or other actions.

In practice, these behavioral countermeasures designed to improve driver safety can produce unexpected results or simply fail to work. Augmenting state and national research with real-world information would provide MDOT with insight into the expected effectiveness of various driver safety measures, allowing practitioners to make more informed choices when selecting countermeasures for implementation.

Approach

Researchers began with a comprehensive review of state and national countermeasures intended to increase driver safety, with particular attention given to measures already implemented in Michigan. After examining the effectiveness of each measure, costs to implement, and issues to consider when implementing, researchers analyzed the factors that contributed to the measure's success. In the final phase of the project, researchers studied a new and promising countermeasure to counteract

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> *"As safety professionals, we have to stress the importance of safe driving behavior every time someone gets behind the wheel. This research adds to the driver behavior safety countermeasures and gives specific implementation issues for Michigan to consider."*
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> **Kimberly Lariviere, P.E.**
> Project Manager

the tendency of drivers to increase speed as they travel through a construction zone.

Research

Researchers examined nearly 40 countermeasures in five driver safety problem areas: alcohol-impaired driving; young drivers; distracted driving; drowsy driving; and older drivers. While data on effectiveness is not yet available, researchers also explored three new and innovative solutions that show promise in improving driver safety behaviors.

In the project's final task, researchers recruited 20 subjects to participate in a driving simulator study that examined the effectiveness of a passive speed control device—barrels—in construction zones. Subjects drove through five construction zone scenarios with varying lengths and varying spacing patterns between the barrels to determine the effect of barrel spacing on driver speed.

Results

The final report serves as a ready reference for state and local agencies in selecting behavioral countermeasures appropriate for use in Michigan. The report presents five driver behavior topics:

- alcohol-impaired driving
- young drivers
- distracted driving
- drowsy driving
- older drivers

Each of these categories, as well as an innovative solutions section, includes a topic overview and ratings for each countermeasure (high, medium or low) on three dimensions:

- ***Effectiveness.*** Expert evaluations form the basis for judgments regarding effectiveness, and researchers offer a critical analysis of the factors that contribute to a countermeasure's success. A discussion of differences in the application of countermeasures across states helps safety professionals tailor an implementation plan specific to Michigan.
- ***Costs.*** Costs can vary significantly. For example, public interest and education campaigns tend to be relatively low in cost. At the other end of the spectrum are the costs associated with engineering countermeasures.
- ***Implementation issues.*** Factors influencing implementation success include administrative challenges, public acceptance of the countermeasure, the current political and economic climate, and technological advances.

Each section closes with a list of references.

Results of the pilot study to test the effectiveness of barrel spacing in reducing speeds in construction zones indicate:

- A slow, gradual reduction of the spacing between the barrels caused greater reductions in speed than a more rapid reduction of the spacing between the barrels.
- More rapid reduction of barrel spacing reduced variability in vehicle speeds.

Researchers recommend field-testing to continue examining the effect of barrel spacing and placement on driver speed.

Value

Rather than providing specific direction about which behavioral countermeasures to implement, this project sought to provide practical information lacking in other reports about anticipated levels of effectiveness, costs and any implementation issues specific to Michigan. By considering countermeasures in the context of Michigan's infrastructure and geographic, demographic and cultural characteristics, the final report's recommendations can give safety professionals in MDOT and other state and local agencies greater confidence in selecting, modifying and implementing behavioral countermeasures that will work.

Research Administration

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This final report is available online at
http://www.michigan.gov/documents/mdot/MDOT_Research_Report_RC1561_372531_7.pdf.

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