

Evaluation of Innovative Traffic Safety Devices at Short-Term Work Zones

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Executive Summary

The objective of this study was to investigate and evaluate the usage and effectiveness of innovative traffic control devices that can be used in short-term work zones. Any device to be used in short-term work zones should command the respect of drivers, be durable, have an easily understood meaning, be low cost, be quick and easy to install and remove, and be reusable.

This study was conducted in three sections: a literature review of previously published research, a nationwide usage survey, and a field test for a selected device, portable plastic rumble strip (PPRS).

Review and Survey Results of Innovative Traffic Control Devices

The usage and the effectiveness of portable devices/systems that possibly could be used at short-term work zones were investigated. The survey focused on innovative or unique safety devices that any state is using or has used in the past and their states' comments on the devices' perceived effectiveness. A total of 26 states responded to the survey. Existing research, implementation, and available evaluation results as well as the survey results for these devices were also reviewed and summarized by device.

Field Test of Innovative Portable Rumble Strips

Portable plastic rumble strips (PPRSs), which have been tested on a closed course, were found to be a device potentially suitable for use at short-term work zones. This field study was to investigate the effects of the PPRSs and drivers' response to them at three short-term maintenance work zones in Kansas. The results showed that the effect of PPRSs in speed



Installation of PPRS

reductions was more significant on cars than on trucks. The PPRSs reduced car speeds by 4.6 to 11.4 mph. They also created 5.0 to 11.7 mph mean speed reduction for trucks, but the reductions were only at two test sites. It was observed that 30 to 80% of truck drivers activated their brakes (indicated by brake light illumination) when they approached the PPRSs. In addition, about 5% of car and truck drivers swerved around the PPRSs. This indicates that additional signage or other supplemental traffic devices would be needed when the PPRSs are implemented.

Recommendations

Based on a literature review, nationwide survey, and a field test of a device that was currently available on the market, it was shown that indeed there are useful applications for several innovative traffic safety devices. Thus, these devices should be strongly considered for usage where appropriate in addition to existing typical traffic control devices.

Portable Plastic Rumble Strips

The effectiveness of this product has been confirmed through both closed course and field tests. They are easy to install (compared to adhesive-based strips), easy to remove, and are reusable. The field test results also found that they were effective in alerting drivers resulting in speed reductions for both cars and trucks. **Two sets of four strips at 36 inches spacing are recommended for short-term work zones in addition to existing traffic control devices in the temporary traffic control plan.** However, since about 5% of drivers were observed to swerve around the PPRSs during the field test, additional driver information such as a supplemental advisory sign may be needed to assure the public that these devices are indeed meant to be traversed. Additionally, future research into appropriate signage or other supplemental traffic control is needed to minimize drivers avoiding the PPRS.

Portable Speed Monitoring Signs

The portable speed monitoring display has been found to be a very effective device in speed reduction. The speed monitoring display installed in a portable sign instead of being installed in a trailer is recommended based on the low cost and effort of the installation. This sign could easily be integrated into the existing temporary traffic control plans for short-term work zones.

Vehicle-Activated Signs

Similar to the portable speed monitor display, the vehicle-activated signs are easy to set up to alert drivers who are over the speed limit. They can also be embedded into standard temporary traffic control plans for short-term work zones.

Intrusion Alert System

The idea of an intrusion alarm systems is positive. However, the effectiveness of this device was not shown. Demonstration results from other states found that this device still has some deficiencies such as the inadequate sound and excessive time required for installation. The application of this device at short-term work zones is not recommended until this product space has matured and obtains approval by the demonstration states.

Report Information

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