



Project Summary

Texas Department of Transportation

0-6163: Improved Positive Protection Guidance for Work Zones

Background

On December 5, 2007, the Federal Highway Administration (FHWA) published 23 CFR Part 630 Subpart K – Temporary Traffic Control. The objective of the rule is to “decrease the likelihood of highway work zone fatalities and injuries to workers and road users.” The new rule establishes requirements related to five items for federal-aid projects:

- general agency guidance or project-specific measures identified through engineering studies to determine the need for positive protection in work zones,
- exposure control measures to avoid or minimize worker exposure to motorized traffic and motorist exposure to work activities,
- other traffic control strategies (including uniformed law enforcement officers) to minimize work zone crashes,
- safe entry/exit of work vehicles onto/from travel lanes, and
- contract pay items to ensure availability of funds for these provisions.

The rule does not provide specific requirements or thresholds on positive protection usage. Rather, states are responsible for developing general policies or project-specific decision frameworks for determining situations, locations and types of positive protection to use. FHWA encourages states to consider techniques intended to reduce the likelihood that a vehicle intrusion into the work zone will occur at all.

The specific objectives of this research project were as follows:

- analyze the benefits and costs of using portable concrete barriers (PCB) for positive protection in work zones,
- analyze the benefits and costs associated with the use of moveable and portable barrier technologies that can be more quickly deployed and removed at work sites than traditional PCB,
- analyze the benefits and costs of non-positive protection devices that can be used to improve safety and reduce work zone intrusion events in work zones, and
- develop implementation guidelines for these various technologies.

Research Performed by:

Texas Transportation Institute (TTI),
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Project Completed: 8-31-10

What the Researchers Did

Researchers surveyed Texas Department of Transportation (TxDOT) district personnel to determine criteria followed when deciding whether to use positive protection. Researchers then used the Roadside Safety Analysis Program (RSAP) to estimate roadway average daily traffic (ADT) levels where a reduction in crash costs by providing positive protection would offset or exceed the costs of providing the positive protection. Three work zone scenarios were examined:

- work zones without any drop-off concerns present, where positive protection is provided solely to prevent intrusion crashes with workers, equipment, and work materials in the work space,
- work zones where a drop-off exists some lateral distance from the travel lanes, and the work space is located between the travel lanes and the drop-off, where positive protection can be justified based on both a reduction in intrusion crashes with workers, equipment, and materials in the work space and a reduction in drop-off crash costs, and
- work zones where a drop-off exists next to or a short lateral distance from the travel lanes, and the work space is located beyond the drop-off, where positive protection can be justified based on both a reduction in drop-off crash costs and a reduction in intrusion crashes with workers, equipment, and materials in the work space.

Researchers used RSAP as well as work zone crash data and crash prediction models to evaluate the cost-effectiveness of portable steel barriers, mobile barriers, and truck-mounted attenuators as well as techniques and strategies available to reduce the actual frequency of intrusions. Because many of these devices and strategies are deployed for short time periods, researchers examined cost-effectiveness in terms of expected crash cost reductions per hour of deployment.

What They Found

Researchers found that portable concrete barriers can be justified in a few cases at traffic exposures lower than thresholds currently used for drop-off protection considerations, depending on how the work space is utilized during the project. Also, researchers showed that steel barriers and mobile barriers may be cost-effective alternatives for short-duration and mobile operations with workers on foot on high-volume, high-speed facilities. Truck-mounted attenuators were found to be very cost-effective, offsetting their costs in less than a year of use in most cases.

What This Means

Through this project, researchers improved guidelines for the use of portable concrete barriers in work zones. Guidelines regarding the use of portable steel barriers, mobile barriers, and truck-mounted attenuators were also developed. Information regarding the use of exposure control measures and other traffic control measures, including law enforcement, to reduce work space intrusion risks and improve work zone safety were also included in this report.

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