

0-7096: Traffic Control Device Analysis, Testing, and Evaluation Program

Background

Evaluating the numerous types of traffic control devices (TCDs) newly available and installed across Texas roadways is a key for the Texas Department of Transportation (TxDOT) to maintain roadway safety and proper performance of TCDs. Evaluations are also needed in order to cost-effectively implement new devices and technologies for continual improvement of the system. This project team conducted high-priority, short-term evaluations of TCDs. The TCD issues evaluated represented new devices or technologies, new applications of an existing device or technology, TCD material performance, changes in practices regarding a TCD, or other TCD-related needs.

What the Researchers Did

Over the course of the project, researchers reviewed current and best practices, assessed effectiveness, and made further research recommendations about the following devices:

- Wet-weather pavement markings.
- Shoulder rumble strips.
- Overhead lane control signs for frontage road and ramp approaches to signalized intersections.
- Speed feedback signs in high-speed management approaches.
- Direction indicator barricades in work zones.
- Driveway assistance devices (DADs) in work zones (Figure 1).

In addition, the team examined:

- Motorist interpretations of centerline buffer widths on two-lane, two-way roads.
- Vehicle speeds and signing needs for gradual curves.

- Countermeasures for unexpected pedestrians on high-speed roads.

The team also conducted numerous activities for the TxDOT Traffic Safety Division that were considered internal in nature.



Figure 1. Example of Recommended DAD Design.

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What They Found

Detailed findings for each of these research areas and activities can be found in the published research reports. Selected highlights are summarized as follows:

- Field assessments of wet-weather pavement markings revealed the need to confirm that the markings are properly installed. Inspection and continuous wet retroreflectivity evaluations are key factors to ensure that markings are properly installed. Researchers produced guidance material to help TxDOT and its contractors with continuous wet retroreflectivity measurements. The guidance covers all aspects of the measurement process including the equipment, calibration, setup, measurement techniques, and best practices. A summary field guide and two short videos were also developed to support the guidance material. The videos provide detailed information on equipment calibration and how to conduct the measurements. The field guide serves as a simple document to reference while in the field taking measurements.
- Field evaluations at three rural divided highway sites confirmed that shoulder rumble strips can be moved from edgeline applications to center-of-shoulder applications at tangents and on the insides of curves without negatively impacting operations. This change should not result in increased frequency of shoulder encroachment, and should decrease noise impacts. However, this change will allow drivers who deliberately “cut” curves to do so for a longer period before encountering a warning.
- Field evaluation and motorist survey results support the use of the three-section doghouse DAD with a NO TURN ON RED (R10-11) sign and a TURN ONLY IN DIRECTION OF ARROW sign to control traffic at low-volume driveways when a lane is closed for an extended period on a two-lane, two-way road. Researchers also recommended that DADs be located on the nearside of the intersection.
- Motorist survey results found that driver comprehension of the correct driving behavior declines when the centerline buffer width is 6 ft or greater. The survey findings supported centerline buffer widths of 1 to 4 ft.
- Recent guidance for rural highway curve signing is based on examining vehicle speeds, particularly truck speeds, for the purpose of setting advisory speeds. Researchers reexamined the guidance and identified additional criteria to improve signing practices for gradual curves (i.e., degree of curve is 2 or less). The revised criteria will reduce the number of Advisory Speed Plaques that will be recommended for gradual curves and help avoid the posting of unneeded signs at these sites.

What This Means

Based on the research findings, the research team developed implementable recommendations, specifications, test methods, training materials, and policy decision materials pertaining to a wide range of TCD issues and topics. Published technical reports contain details.

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