# Project Summary

Texas Department of Transportation

# 0-5526: Impact Performance Assessment of Roadside Safety Appurtenances

## Background

Guidelines for testing and evaluating the impact performance of roadside safety features are periodically updated to stay current with improvements in technology and changes in the vehicle fleet and impact conditions. A recommended update to *NCHRP Report 350* (Update) was recently developed under NCHRP Project 22-14(02), "Improved Procedures for Safety-Performance Evaluation of Roadside Features." This document contains revised criteria for safety-performance evaluation of virtually all roadside safety features. Changes being proposed as part of the new guidelines include new design test vehicles, revised test matrices, and revised impact conditions. These changes will place greater impact performance demands on roadside safety features and will likely necessitate the re-evaluation of the impact performance of some existing roadside features.

***Crash Test of Texas Precast Concrete F-Shape Barrier with Type X Connection Using a 5000-lb, ¾-ton Pickup.***

## What the Researchers Did

An evaluation of Texas roadside safety devices was conducted to help assess the impact of adopting the Update on current hardware. Crash test results, engineering analyses, and engineering judgment formed the basis of the hardware evaluation. Categories of roadside features that were considered under the project include guard fence, median barriers, bridge rails, transitions, breakaway sign supports, precast work zone barriers, and work zone traffic control devices. Proprietary devices were not considered. The manufacturers of proprietary devices will be required to assess the impact performance of their devices and demonstrate compliance of their devices with the Update.

Each roadside safety device utilized and evaluated by the Texas Department of Transportation (TxDOT) under the project was assigned a performance assessment rating based on its ability to comply with the Update. Results of the performance assessment were used to develop a prioritization scheme for further testing and evaluation required to bring Texas roadside safety features into compliance with the new impact performance guidelines.

## Research Performed by:


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Each roadside safety device was assigned a prioritization ranking based on its performance assessment, extent of usage and/or perceived importance of the device to TxDOT operations, and other applicable factors.

Two generic small sign support systems commonly used by TxDOT were successfully tested under this project using the new ½-ton, 4-door pickup truck design vehicle. The Update proposes the use of the pickup truck in the evaluation of breakaway support structures to assess the potential for occupant compartment intrusion.

## What They Found

Devices that have been successfully tested and found to comply with the Update should not require any further testing or evaluation. These devices include:

- metal beam guard fence,
- precast concrete F-shape barrier with Type X connection and 10-ft long segments,
- Test Level 3 (TL-3) nested thrie beam transition,
- wedge anchor small sign support system,
- triangular slip base sign support system with 10 British Wire Gage (BWG) supports, and
- a tall-mounting height temporary sign support with wooden 4 inch x 4 inch supports.

Devices that are presently untested or only partially tested under the Update were assigned a priority ranking based on their probability or likelihood of complying with the requirements of the Update. The only device assigned a high priority for further testing and evaluation under the update is the T101 bridge rail. This priority is based primarily on the absence of pickup truck testing on this system.

Devices with a medium priority should be programmed for further testing and evaluation under the Update as resources permit. Future testing of devices assigned a low priority should be considered after the higher priorities have been addressed.

## What This Means

The prioritized list will assist TxDOT personnel in the Bridge, Design, and Traffic Operations Divisions in developing projects under which the additional testing and evaluation required to bring Texas roadside safety hardware into compliance with the Update can be accomplished. The prioritization of hardware will help ensure efficient use of resources and provide a relatively seamless transition to the Update. Further, the performance information provided by this project should assist TxDOT personnel in understanding the implications of adopting the Update as it progresses through the American Association of State Highway and Transportation Officials (AASHTO) review and publication process.

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