

0-6772: Development of New Delineator Material and Impact Testing Standard to Prevent Premature Failures Specific to Installation Application

Background

The use of delineators has become popular across Texas. They are being used in several different applications with unique impact conditions and/or impact frequency. There is not a federally mandated national standard for testing and evaluation of delineators. For this reason, each state must either develop personalized evaluation criteria or adopt the American Association of State Highway and Transportation Officials (AASHTO) National Transportation Product Evaluation Program (NTPEP) evaluation standard.

By developing a categorical testing specification, the state can better evaluate delineator products for each application use. This enhanced evaluation would lead to the proper selection of the best delineator for a certain application. By pairing delineators with their proper application, one would expect a reduction of delineator failures and therefore reduction in long-term maintenance costs.

What the Researchers Did

Texas A&M Transportation Institute (TTI) researchers contacted other state departments of transportation to determine how other states were selecting/evaluating delineators and also to determine the most common failure modes. TTI researchers reviewed previous research dealing with delineator failures and placement applications for further insight. Researchers also reviewed previous delineator component testing and contacted manufacturers to determine what problems they may

have experienced with their products. Finally, the researchers contacted the AASHTO NTPEP Temporary Traffic Control Devices Technical Committee to discuss what progress it has made toward the development of its new high-durability testing standard.

From this information, the researchers began to categorize delineator usage into multiple generic applications. The researchers looked at impact vehicle type, installation method, ability of the delineator to right itself, permanent list and lean, impact angle, temperature effects, reflective sheeting retention and degradation, and methods for documentation of testing. The researchers completed an evaluation of the vehicle fleet to determine what vehicle class (not a specific vehicle) constitutes a reasonable worst case for each application. Each class of vehicle was then evaluated to determine if any modifications needed to be performed to the vehicle.

The research and testing have resulted in three different applications that require independent evaluation: low durability, high durability, and metropolitan. Full-scale crash tests for each proposed application were performed to evaluate the testing procedure and to determine if modifications needed

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to be made to the testing procedures or test vehicles. TTI researchers evaluated the results of the preliminary testing to identify and address any problems with the testing procedure or with the vehicle modifications used. After researchers refined the test procedures, further testing was performed as verification.

What They Found

The researchers focused on developing a test method that was reproducible and attempted to reproduce failure modes witnessed through field observations. The researchers also attempted to optimize the testing standard to minimize the cost and effort to evaluate the products. The researchers feel that the process was successful, and a balanced testing standard meeting all requirements has been developed.

What This Means

Now that a standard has been developed, it will allow Texas Department of Transportation (TxDOT) districts to select the proper delineator system for the application in question (Figure 1). This will lead to significant reduction in maintenance costs for repairing these systems.

The researchers recommend that implementation of this research be staged over time as follows to allow the districts, manufacturers, and testing labs to make required adjustments:

- The first stage should include developing the recommended test specification into a TxDOT official specification.
- The second stage should include a sunset rule on the acceptance of products tested using previously accepted methods. This would encourage manufacturers and districts to begin using the new standard.
- The third stage should include the process of reevaluating existing delineator installations to determine if more suitable products should be installed to reduce maintenance costs.

In addition to the implementation of this standard, the researchers recommend that TxDOT develop a design manual containing guidelines for the selection of delineators. This was one of the consistent responses from the survey of the TxDOT districts.



Figure 1. MASH 1100C Modified Test Vehicle for Evaluation of Delineators.

For More Information

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