

0-7171: Barrier Striping for the Reduction of Accidents

Background

Concrete barriers are widely used for roadside and median safety but can be difficult for drivers to detect under adverse conditions such as darkness, rain, or fog. Barrier striping—retroreflective markings applied directly to barrier surfaces—was developed to improve visibility and potentially reduce crashes. The Texas Department of Transportation (TxDOT) previously drafted a special specification for barrier striping, but limited evaluation had been performed. This project examined the safety effectiveness of barrier striping at multiple sites and refined TxDOT’s draft specification based on the study findings.

What the Researchers Did

The research team reviewed past practices for barrier delineation and evaluated barrier striping at several locations in Texas. Five existing sites with barrier striping were analyzed using crash data. In addition, striping was installed at a high-crash location for before-and-after evaluation. The study considered crash history, roadway and traffic characteristics, weather and lighting conditions, and probe vehicle speed data. Statistical approaches included crash frequency models and survival analysis. Speed data from a San Antonio site (I-10 near I-410) were also examined. Based on the analyses, the team recommended

refinements to TxDOT’s draft special specification, including material details, spacing, and installation practices.

What They Found

The evaluations indicated reductions in barrier-related crashes at some treated sites, particularly under nighttime and adverse weather conditions, although the magnitude of the effect varied across locations. Statistical models supported the conclusion that barrier striping can contribute to improved safety though results were not uniformly strong across all sites. Speed analysis at the I-10 site showed small reductions in operating speeds following installation. Overall, the results suggest that barrier striping provides measurable safety benefits, but site context influences its effectiveness.

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What This Means

Barrier striping appears to be a useful, low-cost treatment that can enhance visibility and reduce the likelihood of barrier-related crashes, especially in challenging driving conditions. The updated specification will assist TxDOT in applying the treatment more consistently. Continued monitoring of treatments, evaluation at additional sites, and consideration of long-term assessments are recommended to further determine effectiveness and implementation strategies.

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