



# Project Summary

Texas Department of Transportation

## 0-5609: In-Service Evaluation of Cable Median Barrier Performance

### *Background*

Cross-median crashes (CMCs) usually involve serious injuries and deaths. Many CMCs can be prevented with barrier protection. However, median barriers should not be used arbitrarily as they can pose a hazard to motorists. A barrier is typically warranted when the consequences of encroaching into or across the median are judged to be more severe than striking the barrier.

Cable median barriers, particularly high-tension proprietary systems, have emerged as a popular treatment against CMCs. When impacted, a cable barrier is more forgiving than other barriers because it deflects the impact laterally and reduces the force transmitted to vehicle occupants.



*Cable Barrier with Concrete Mow Strip.*

### *What the Researchers Did*

The research evaluated TxDOT's experience with cable barriers by analyzing installation costs, maintenance costs and experiences, crash history before and after implementation, and field performance. Researchers also studied the state-of-the-practice of cable barriers including benefits of use, available guidelines, barrier placement policies, and maintenance and in-service performance issues. Based on these efforts, the research team developed recommendations and guidelines to direct TxDOT staff in ongoing and future use of high-tension cable barrier systems.

### *Research Performed by:*

Texas Transportation Institute (TTI),  
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## What They Found

Some of the key findings of the evaluation of cable barrier performance in Texas included:

- From a capital and life-cycle cost perspective, cable barrier is an attractive option compared to concrete median barrier.
- Better coordination between TxDOT and emergency responders during the planning and maintenance phases of cable barrier projects may result in more efficient barrier placement.
- Maintenance costs and personnel requirements for cable barriers can be substantial, and constrained budgets and personnel availability for frequent repair needs are ongoing issues.
- Data from Texas and other states show that barrier impacts are influenced by barrier placement. Barriers placed near travel lanes are impacted on a more frequent basis than those placed closer to the center of the median.
- Cable barriers are performing well and have had very few cases of penetration, unless there were non-standard impact conditions. Cable barriers are functioning according to their intended design and are restraining vehicles that impact them in fashions similar to NCHRP 350 crash testing guidelines issued by the National Cooperative Highway Research Program (NCHRP).
- Cable barriers are making a significant contribution to reducing fatal and incapacitating injuries on state roadways, effectively eliminating most of these injury types caused by CMCs. A TxDOT Traffic Operations Division study revealed a reduction of 18 fatalities and 26 incapacitating injuries in the first full year at cable barrier sites. This reduction equates to almost a \$46 million economic benefit based on the current crash cost value for fatal and incapacitating injuries used in safety projects.
- Due to problems experienced in Texas and other states, soil conditions should be considered as part of the project development process for cable barrier installations.

## What This Means

Researchers recommend that TxDOT:

- Increase coordination with emergency services during the project planning and maintenance phases to ensure that their needs are considered and, where practical, implemented.
- Continue to closely monitor cable barrier maintenance and repair activities in order to gain an increased understanding of cost over an extended time period.
- Consider implementing a statewide contract for cable barrier maintenance and repair.
- Place cable barriers as far from the traveled way as possible while maintaining the proper operation and performance of the system. The more lateral offset, the better the opportunity for the driver to regain control of the vehicle in a median and avoid a barrier impact.
- Continue to perform annual updates of the safety evaluation to document the life-saving and injury-reducing benefits.
- Conduct further research to address geotechnical issues so that soil conditions can be appropriately addressed prior to installation of cable barriers.

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