



CALTRANS DIVISION OF RESEARCH,
INNOVATION AND SYSTEM INFORMATION

TRANSFORMING IDEAS INTO SOLUTIONS

Research Notes

Research Support

MAY 2026

Project Title: Midwest Roadside Safety Pooled Fund Program TPF-5(533) (FY25-FY29)

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Midwest Roadside Safety Pooled Fund Program TPF-5(533) (FY25-FY29)

Various highway roadside appurtenances were crash tested to ensure they meet criteria established nationally. Under the pooled fund program, the Midwest Roadside Safety Facility (MwRSF) performs research and Department of Transportation (DOT) support as well as full scale crash testing.

WHAT IS THE NEED?

Road owners and operators, such as state Department of Transportations (DOTs), including the California Department of Transportation (Caltrans), are required to meet federal crash testing safety guidelines. In order to have nonproprietary designs available for use, they need to be developed, tested, analyzed and submitted to the Federal Highway Administration (FHWA) for evaluation. This work requires specific expertise and for the testing lab to be ISO 17025 Accredited. In addition, Caltrans has a large tort liability for vehicle accidents in our right of way. Caltrans can improve safety for the traveling public as well as reduce legal judgment costs by partnering with other DOTs on research to continually improve roadside safety systems.

WHAT ARE WE DOING?

As one of more than 20 state DOTs, Caltrans is participating in the MwRSF Roadside Safety Pooled fund project to improve safety for California and the nation. Caltrans participates through a fund transfer to the pooled fund lead state, Nebraska State DOT. Caltrans participates in the pooled fund project prioritization process, project meetings, as well as the annual and mid-year pooled fund meetings. We also work with our internal Caltrans customers to review and help implement MwRSF developed and tested hardware.



DRISI provides solutions and knowledge that improves California's transportation system.

WHAT IS OUR GOAL?

Caltrans' goal in participating in this pooled fund project is sharing expertise and receiving nonproprietary roadside safety hardware designs for use on its highways while realizing savings in terms of shared costs.

WHAT IS THE BENEFIT?

Caltrans benefits by sharing expertise and receiving roadside safety details and designs for use on our highways. The result is a statewide improvement in safety by reducing injuries and deaths from run-off-road accidents. There is also a reduction in Caltrans tort liability for accidents, ultimately resulting in significant savings for the state of California.

WHAT IS THE PROGRESS TO DATE?

See the following links for pooled fund quarterly reports and the Midwest Roadside Safety Facility Research Hub for completed research:

<https://pooledfund.org/Details/Study/767>
<https://mwrsf.unl.edu/researchhub.php>

MWRSF recently performed crash testing to evaluate crashworthiness of the Hawaii DOT Flared Buried-in-Backslope End Terminal to Test Level 3 (TL-3) criteria of the Association of State Highway and Transportation Official (AASHTO) Manual for Assessing Safety Hardware, Second Edition (MASH 2016). The system consisted of Midwest Guardrail System (MGS) W-beam railing supported by W6x8.5 steel posts and 8-in. deep recycled plastic blockouts, with a lower W-beam rubrail attached to the post.

A single-flare and dual-flare system were tested. Only the dual flare was deemed acceptable to MASH 2016 TL-3 safety performance criteria. A photo of the test article prior to testing and one photo of a crash test are shown below. The testing was broken up into two final reports: one with standard direction impact tests and the other with reverse direction impact tests. The final reports can be found here:

<https://mwrsf.unl.edu/researchhub/files/Report507/TRP-03-496a-25.pdf>
<https://mwrsf.unl.edu/researchhub/files/Report506/TRP-03-496b-25.pdf>

IMAGES



Image 1: Test Article Prior to Testing.



Image 2: MASH Crash Test 3-37a.