

Research Problem Statement

Project Title:	LSRB: MASH TL-3 Evaluation of W-Beam Median Barrier Installed in Raised Median (2024-09-LSRB)
Project Synopsis:	Individually, both two-sided 31" median guardrail and Midwest Guardrail System (MGS) installed above curb have been successfully crash tested to MASH TL-3. However, two-sided 31" median guardrail installed with curb has never been evaluated. Many states commonly use two-sided guardrail in raised medians with 3 to 6-inch curb height. This project would determine the critical offset of TxDOT 31-inch W-Beam Median Barrier behind 6-inch-high AASHTO Type B curb and conduct full-scale crash tests of the critical configuration and impact parameters according to MASH TL-3. Preliminary analysis will inform whether to test a configuration with the rail mounted 31" above the driving surface or 31" above the median height.
Project Goal(s):	<ol style="list-style-type: none"> 1.) Identify any limitations on the use of TxDOT 31-inch W-Beam Median Barrier behind curb in raised medians. 2.) Provide guidance on rail height for MASH median guardrail used in raised medians, including offset thresholds where height should change, if applicable.
Project Background:	TTI developed and evaluated to MASH TL-3 a TxDOT 31-inch W-Beam Median Barrier (TR No. 9-1002-12-8). This project would seek to test this barrier system installed in a raised median with as few design modifications as needed, if any. Many states commonly use two-sided guardrail in raised medians with 3 to 6-inch curb height. In some cases, median guardrail may be added to existing raised medians as a retrofit. Medians with curbs may also be needed to facilitate drainage or snow plowing. Median guardrail is also commonly used with curbs on roadsides where frontage roads or other facilities are located immediately adjacent to highways. Based on testing of MGS with curb, curbs with a small offset distance are unlikely to affect barrier performance, while larger offsets behind curb (i.e., median guardrail in wider raised medians) is more likely to result in vehicle instability. There is a need to determine whether there should be any limits on the width of raised medians with median guardrail or if there is a threshold beyond which median guardrail height should be increased to 31" above the median surface instead of 31" above the driving surface.
Proposed Work Plan:	<ol style="list-style-type: none"> 1.) Task 1 – Employ finite element analysis to identify critical offset distance and curb height, appropriate rail height, and any initial design modifications. 2.) Task 2 – Conduct full-scale crash testing of critical configuration according to MASH TL-3 parameters. Test configuration would include grout in leave-outs around posts within the paved median.
Deliverables:	Test report with design analysis, design details, and full-scale crash test results.
Urgency and Expected Benefit:	Agencies have existing W-beam median barrier in use within raised medians on high-speed facilities. Having a MASH-tested configuration would assist agencies in completing MASH upgrades as maintenance and rehabilitation activities allow.
Problem Funding and Research Period:	Total Estimated Cost = \$XX,XXX
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