

## 2021-09-LSRB

<b>Project Title:</b>	Performance Enhancements of Shortened Blockouts
<b>Project Synopsis:</b>	<p>Since MASH implementation began, W-beam ruptures during crash testing have been more frequent than during the days of NCHRP Report 350, and have included instances with the small passenger car in addition to the pickup truck. Research has identified possible performance benefits associated with the use of shortened (in the vertical dimension) blockouts in several barrier applications. This project will evaluate and quantify those benefits with the goal of further improving the impact performance of W-beam barriers.</p>
<b>Project Goal(s):</b>	<p>Evaluate the impact performance improvement achieved using shortened blockouts in W-beam guardrail applications.</p>
<b>Project Background:</b>	<p>The impact severity associated with MASH crash tests increased in comparison to NCHRP Report 350. This has placed a greater demand on barrier systems that has resulted in failures of some existing W-beam guardrail barrier applications. While the improvements incorporated into the Midwest Guardrail System (MGS) have enhanced capacity, researchers have continued to see W-beam rail ruptures during both small car and pickup crash tests of various guardrail configurations. This can be attributed to the increased demand and different vehicle interactions resulting from the change of test vehicles and impact conditions, including an increase in impact angle in Test 3-11 from 20 to 25 degrees. During recent testing, researchers identified possible impact performance benefits associated with the use of shortened (in the vertical direction) blockouts. These shortened blockouts were most recently successfully implemented in a W-beam guardrail system with half post spacing that had previously failed due to rail rupture in a test with standard length blockout and a three-beam guardrail and median barrier system developed through the Roadside Safety Pooled Fund. Further, shortened blockouts have been used for years in three-beam transitions systems to improve vehicle stability. Therefore, there is a need to investigate if the use of shortened blockouts can provide similar enhancements to other W-beam guardrail systems.</p>

<p><b>Proposed Work Plan:</b></p>	<p><b><u>Tasks:</u></b></p> <ol style="list-style-type: none"> <li>1. Engineering Review</li> <li>2. MASH Crash Testing</li> <li>3. Reporting</li> </ol>
<p><b>Deliverables:</b></p>	<p>Compile summary report to document research effort, including literature review, CAD details, crash testing, and recommendations for further research.</p>
<p><b>Urgency and Expected Benefit:</b></p>	<p>This project will investigate the impact performance enhancements achieved using shortened blockouts. With a high instance of W-beam rail ruptures, there is a need to investigate cost-effective improvements that can effectively increase guardrail capacity and mitigate rail rupture, including the use of shortened blockouts. Their use of shortened blockouts may also provide other benefits including enhanced vehicle stability.</p>
<p><b>Problem Funding and Research Period:</b></p>	<p>\$190,000 and 14 months.</p>
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