

<p><b>Project Title:</b></p>	<p>Transition from W-Beam Guardrail to Concrete Barrier</p>
<p><b>Project Synopsis:</b></p>	<p>Develop and evaluate a MASH TL-3 compliant W-Beam transition to various types of concrete barriers using engineering analysis, simulation, and/or crash testing. The concrete barriers for consideration include a 32-inch and 42-inch Vertical Wall, F-shape, NJ shape, and single slope with/without flare.</p>
<p><b>Project Goal(s):</b></p>	<ol style="list-style-type: none"> <li>1. (a) To develop a MASH TL-3 compliant W-Beam Guide Rail Transition to Vertical Wall Bridge Barrier.  - <i>TTI Comment: This type of transition is being evaluated under PennDOT MASH Implementation project WO1-TA027 (TTI Project No. 608221)</i></li> <li>(b) To develop a MASH TL-3 compliant W-Beam Guide Rail Transition to single slope, F-shape cast-in-place and precast barriers, and NJ shape barrier  - <i>TTI Comment: The F-Shape CIP barrier transition is being evaluated under PennDOT MASH Implementation project WO1-TA027 (TTI Project No. 608221)</i></li> <li>2. (a) To develop a MASH TL-3 compliant stacked W-Beam transition to vertical wall bridge barrier  - <i>TTI Comment: TTI will be conducting a TxDOT sponsored project in the future to develop and test a MASH TL-3 compliant stacked W-Beam transition to a median Single Slope barrier.</i></li> <li>(b) To develop a MASH TL-3 compliant stacked W-Beam transition to F-shape concrete barrier</li> <li>3. Evaluate MI thrie beam transition or other thrie beam transitions to Vertical wall, F-shaped, and single slope barriers.  - <i>TTI Comment: Problem Statement No. 2019-19-LSRB already addresses this project goal.</i></li> </ol>
<p><b>Project Background:</b></p>	<p>Pennsylvania - PA uses F-shape, vertical wall, and structure mounted guiderail as common bridge railings. W-beam transitions to F-shape bridge barrier with a 10-degree flared wing was crash tested by TTI in 2000 and 2005 for NCHRP 350 TL-3 and TL-4 respectively. These W-Beam transitions need to be re-tested for MASH 2016 TL-3.</p> <p>PA is quite interested in W-Beam transition to vertical wall bridge barrier.</p> <p>Michigan - MI uses transitions containing thrie-beam panels, and these transitions are MASH compliant. However, these transitions may only be attached to a vertical concrete wall. Therefore, MI is interested in a transition (containing thrie-beam panels, w-beam panels, or a combination of both) that can be attached directly to a single-slope concrete barrier or NJ/F-Shape concrete barrier.</p> <p>Alabama - In order to assist in the problem statement development for the transition from the W-Beam to concrete barrier, would it be possible to get a better understanding of the failure of the MASH test for the Stacked W-Beam Transition – Test Report No. 604581-1, May 11, 2016? The</p>

	<p>report is <a href="https://www.roadsidepooledfund.org/wp-content/uploads/2017/04/TMNo604581-1-Final.pdf">https://www.roadsidepooledfund.org/wp-content/uploads/2017/04/TMNo604581-1-Final.pdf</a> .</p> <p><i>Our state uses a stacked w-beam to a vertical face, and based on what was learned from the crash test, are there tweaks that are suspected could be made and this become a passing system? Things such as revised post spacing, a longer vertical face on the bridge rail, etc... Or are there fatal flaws with a stacked w-beam such that there is nothing perceived that will fix it?</i></p> <p>Delaware - DE has a similar detail with an attachment to F-Shaped barrier. If this detail does not pass, it will create an issue with us. The only thought that I had was to use a 42" barrier as the truck seems to rotate over the wall slightly but I don't know if the extra 10" would make a difference. I am not sure how many other states use this detail but it does seem popular.</p> <p>TTI can point out if a W-Beam transition is available or which transition could be useful to majority of States.</p>
<p><b>Proposed Work Plan:</b></p>	<p><b><u>Tasks:</u></b></p> <p>- Note: This proposed work plan is only considering one type of transition (i.e., W-Beam, stacked, or Thrie-Beam). Each type of transition should be considered under separate projects.</p> <ol style="list-style-type: none"> <li><b>1. Literature Review and Engineering Analysis:</b> <ol style="list-style-type: none"> <li>a. Evaluate various current W-Beam transition designs from states and determine which design is most commonly used by states.</li> <li>b. Determine the critical transition design.</li> <li>c. Evaluate what is necessary for MASH determination (i.e., professional opinion, simulation, and/or crash testing).</li> <li>d. If crash testing is necessary, determine which crash tests are critical for MASH compliance.</li> </ol> </li> <li><b>2. Construction and Demolition</b></li> <li><b>3. Full-Scale Crash Testing and Reporting:</b> <ol style="list-style-type: none"> <li>a. Perform critical full-scale crash tests determined in Task 1. (Budgeting for two crash tests)</li> <li>b. Provide final report summarizing the details of the test installation, final drawings, and our finding and conclusions.</li> <li>c. Provide a professional opinion that indicates that tests not conducted are not critical due to successfully performed tests on similar systems in the past.</li> <li>d. Provide a professional opinion for MASH compliance of the other designs not selected for crash testing.</li> </ol> </li> </ol>
<p><b>Deliverables:</b></p>	<p>A report providing details of the transition, documentation of the evaluation, the results of each crash test if performed, and the assessment of the performance of the transition according to MASH TL-3 criteria.</p>
<p><b>Urgency and Expected Benefit:</b></p>	<p>Several states connect W-Beam guardrail to various concrete barriers. MASH compliant transitions are urgently needed to meet MASH compliance dates.</p>

<b>Problem Funding and Research Period:</b>	<p><b>Total Cost Estimate = \$130,000</b></p> <p><b>Work Schedule:</b> (Estimated Project Duration = 10 months from initiation of the project) - Note: This proposed work schedule is only considering one type of transition (i.e., W-Beam, stacked, or Thrie-Beam). Each type of transition should be considered under separate projects.</p> <ul style="list-style-type: none"><li>• Task 1 = 3 months</li><li>• Task 2 = 3 months</li><li>• Task 3 = 4 months</li></ul>
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