



# Research Project Statement 24-036 FY 2024 Annual Program

<b>Title:</b>	Evaluate Safety End Treatments for Roadside Drainage Structures
<b>The Problem:</b>	<p>Roadway drainage design often calls for the use of cross-drainage and parallel-drainage culverts. If untreated, the ends of the culvert structures can become roadside hazards that can result in serious injury when an errant vehicle leaves the roadway. Safety treatments for roadside cross-drainage culverts include shielding the culvert with guardrail or bridge rail; or making the culvert end traversable. The most cost-effective strategy is often to make the culvert end traversable using grates comprised of pipe runners across the culvert end.</p> <p>The objective of this research is to investigate the safety performance of both traversable cross-drainage and parallel-drainage culvert end treatments installed on roadside slopes. TxDOT has several standards that provide details for these structures including those for box culverts (SETB) and pipe culverts (SETP) terminating in straight wings (SW) and flared wings with skew and non-skewed pipe or box entry (FW-0 and FW-S). This research will need to cover all the variations of safety end treatments support by the standards.</p>
<b>Technical Objectives:</b>	<p>Development of pipe runner treatments that comply with AASHTO MASH will provide a cost-effective safety end treatment for the ends of many cross-drainage and parallel-drainage structures on roadside slopes. This research will develop safety end treatments for application to the ends of both cross-drainage and parallel-drainage culverts on roadside slopes that comply with the AASHTO Manual for Assessing Safety Hardware (MASH).</p> <p>To meet the objectives of this project, the research team shall:</p> <ul style="list-style-type: none"> <li>• Conduct finite element modeling and simulation to evaluate impact performance</li> <li>• Identify critical impact conditions for the roadside culvert pipe runners installed on roadside slopes.</li> <li>• Conduct full-scale vehicle testing at an ISO 17025 accredited laboratory to evaluate performance of the selected pipe runner designs and verify MASH compliance.</li> <li>• Develop guidance on the recommended slopes and size, length, and spacing of the pipe runners to provide safe vehicle traversability.</li> </ul> <p>The expected technology readiness level (TRL) for this project is 8.</p>
<b>Anticipated Deliverables:</b>	<ol style="list-style-type: none"> <li>1. Technical memorandum for each task completed.</li> <li>2. Monthly progress reports.</li> <li>3. Value of Research (VoR) that includes both qualitative and economic benefits, to be included in the final research report. This is not a stand-alone deliverable.</li> <li>4. Research report documenting the findings of this research, including results of finite element simulations and full-scale vehicle tests, detailed drawings of the recommended pipe runner treatments, and implementation guidance.</li> <li>5. Project Summary Report.</li> </ol>
<b>Proposal Requirements:</b>	<ol style="list-style-type: none"> <li>1. Project duration shall not exceed 36 months.</li> <li>2. Proposal Deadline: 12:00 p.m. Central Time, <b>Monday, March 6, 2023</b>.</li> <li>3. RFP#1 Q&amp;A Deadline: 12:00 p.m. Central Time, <b>Wednesday, February 1, 2023</b>.</li> <li>4. Use the current "ProjAgre" and "PA Forms" templates located at the <a href="#">RTI Forms webpage</a>.</li> <li>5. Proposals will be considered non-responsive and will not be accepted for technical evaluation if they are not received by the deadline or do not meet the requirements stated in RTI's <a href="#">University Handbook</a>.</li> <li>6. Proposals should be submitted in PDF format; (1) PDF file per proposal. File name should include project name and university abbreviation.</li> <li>7. This project will be tracked during the life of the project using the Technology Readiness Level (<a href="#">TRL</a>) scale.</li> <li>8. The 2021 Texas Legislative Session requires that universities be in compliance with Senate Bill 475 by submitting a completed and signed TxDOT Security Questionnaire (TSQ) to <a href="mailto:RTIMAIN@txdot.gov">RTIMAIN@txdot.gov</a> in advance of a proposal submission. Universities found to not submit a completed and signed TSQ in advance of proposal submitting will be held in non-compliance and unable to participate in the Program.</li> </ol>

