



# Research Project Statement 24-192 FY 2024 Annual Program

<b>Title:</b>	Synthesis: The State of Knowledge and State of Practice for Non-Contact Radar Stream Gauges in Texas, the United States, and Internationally
<b>The Problem:</b>	<p>The United States Geological Survey (USGS) and other entities have begun to use non-contact radar for stream gauging to collect near-real-time stream velocity, discharge, and stage. Use of these devices is limited compared to traditional stream gauge methods that are typically used by the USGS and local government agencies in Texas. At the state level, TxDOT is leading the way, through partnership with the USGS, to deploy these stream gauges and is constantly learning how they can best be deployed. Because the gauges measure stream velocity and water level, they are easier and more useful to install in tidal areas than traditional gauges. In some streams, there is a peak in velocity wave in advance of a peak in water surface elevation, potentially acting as an advance warning of flood levels. Installation of these gauges is far simpler than traditional gauges in areas where channel vegetation, slope, or size, may affect equipment that must be installed down in the channel. While these gages appear to be less expensive to operate and maintain than traditional USGS gauging approaches, it would be beneficial to learn from experiences in other US states, agencies, and other countries who have used these devices for longer periods of time rather than solely learning by doing.</p>
<b>Technical Objectives:</b>	<p>TxDOT has been investing in expanding the gauge network. Non-contact radar gauges are significantly less expensive and learning from the existing knowledge and experience base would allow TxDOT to be significantly more effective and efficient. Gauges are used for real-time information on flooding at bridges as well as emergency management, hydrologic and hydraulic modeling, scour analysis, and design of new structures.</p> <p>This work will include providing a synthesis on the state of knowledge and the state of practice for non-contact radar stream gauges, including how to site them; e.g., multiple gages across a wide floodplain, use in steep and flashy systems, upstream versus downstream mounting on bridges. The scope should include local governments in Texas, other state and federal agencies, including DOTs, and countries with longer experience.</p> <p>This information will allow TxDOT and other entities to be more efficient and effective in siting a future network of gauges. Information about long-term operational and maintenance costs and requirements should also be included and a summary of the various types of agencies who fund versus install and maintain. This work should include sufficient discussion with gauge owners and operators to obtain the best information possible. Questions such as "did it take a while to get a baseline of data established to determine how these compare to traditional gauges, where is the accuracy of gauges stronger/weaker and to what degree, what other applications and benefits have you found?" should be included.</p> <p>The expected technology readiness level (TRL) for this project is 2.</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 the research, including information to inform planning for potential future gauge installations, list of gauges, and specifications (types and vendors) that are most commonly used by other entities and countries and history of use.</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 12 months.</li><li>2. Project budget shall not exceed \$65,000.</li><li>3. Proposal Deadline: 12:00 p.m. Central Time, <b>Monday, March 6, 2023.</b></li><li>4. RFP#1 Q&amp;A Deadline: 12:00 p.m. Central Time, <b>Wednesday, February 1, 2023.</b></li><li>5. Use the current “ProjAgre” and “PA Forms” templates located at the <a href="#">RTI Forms webpage</a>.</li><li>6. 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>7. Proposals should be submitted in PDF format; (1) PDF file per proposal. File name should include project name and university abbreviation.</li><li>8. This project will be tracked during the life of the project using the Technology Readiness Level (<a href="#">TRL</a>) scale.</li><li>9. 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>
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