



# Research Project Statement 24-122 FY 2024 Annual Program

<b>Title:</b>	Data-Driven Prioritization of Roadway Segments for Treatment during Severe Weather Events
<b>The Problem:</b>	Several TxDOT districts experience snowstorms and flash floods annually, which in turn adversely impact roadway links. During such weather events, it is common practice for district transportation authorities to loosely prioritize the affected roadway links based on the link types; typically ranking the interstate highways as the topmost priority, followed by the arterials, collectors, and other local roads, with the intent to maximize their limited maintenance and treatment resources. Several important factors, such as incident/accident likelihood, criticality of links; e.g., a bridge or flyover may freeze earlier during a snow storm than other links, and mean speed recovery of links based on the degree of treatment, are challenging to incorporate into the prioritizing process. As a result, the current practices may be sub-optimal in terms of treatment effectiveness. Historical data related to weather, speed, incident locations, and treatment activities are generally available in district repositories, but are often underutilized. This project proposes the use of a data-driven approach using the historical data to help district operators prioritize roadway segments for maintenance/treatment activities.
<b>Technical Objectives:</b>	<p>This project will analyze historical weather, speed, accident, and treatment activity data of a district in Texas that is prone to severe snowfall and rain to gain useful insights regarding the treatment effectiveness, which may further help in effective prioritization of roadway segments. The process for historical data retrieval and extraction of appropriate information during a weather event will be documented. This data will then be used to analyze the effectiveness of the historical treatment activities for different intensities of weather storms in terms of reported incidents/accidents and mean speed recovery rates of links and the network. Based on the outcome of this analysis, effective treatment strategies and prioritization of roadway links for the most efficient result shall be recommended.</p> <p>The prioritization of links for treatments will directly benefit district operations in terms of deploying a more efficient roadway treatment strategy during severe storms, which will result in both increasing the effectiveness of roadway condition remediations by achieving a higher link speed recovery rate and decreasing costs in terms of the treatment resources used. The methods employed in this effort can be easily extended to other districts within or outside TxDOT's jurisdiction.</p> <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 activity 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 data retrieval sources and methods, analysis of historical weather data and treatment strategies, and prioritization methodology of the roadway links adopted to recommend effective treatment strategies.</li> <li>5. Project Summary Report</li> </ol>
<b>Proposal Requirements:</b>	<ol style="list-style-type: none"> <li>1. Proposal Deadline: 12:00 p.m. Central Time, <b>Monday, March 6, 2023.</b></li> <li>2. RFP#1 Q&amp;A Deadline: 12:00 p.m. Central Time, <b>Wednesday, February 1, 2023.</b></li> <li>3. Use the current "ProjAgre" and "PA Forms" templates located at the <a href="#">RTI Forms webpage</a>.</li> <li>4. 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>5. Proposals should be submitted in PDF format; (1) PDF file per proposal. File name should include project name and university abbreviation.</li> <li>6. This project will be tracked during the life of the project using the Technology Readiness Level (<a href="#">TRL</a>) scale.</li> <li>7. 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>

