



# FY 2025 Annual Program Research Project Statement 25-094

<b>Title:</b>	Exploring the Use of Antioxidants to Substantially Increase Cracking Life of Asphalt Pavements
<b>The Problem:</b>	<p>An important factor that triggers cracking in asphalt pavements is stiffening and embrittlement due to oxidative aging. Given high temperature degree days in Texas, oxidation and reduction in pavement life due to cracking will continue to remain a growing problem.</p> <p>Recent laboratory studies conducted by a global consortium of researchers across four continents and 12 countries have shown promising results on the use of antioxidants to significantly slow aging in asphalt and increase cracking life.</p> <p>Antioxidative agents can potentially double or more the cracking life of asphalt pavements. Antioxidants can also more than mitigate the reduced cracking life of asphalt pavements due to higher service temperatures (magnitude and duration of high temperature days). By advancing this approach, TxDOT can potentially double or more the serviceable life of asphalt pavements and benefit from associated cost savings.</p>
<b>Technical Objectives:</b>	<p>The objectives of this project are:</p> <ul style="list-style-type: none"><li>• Conduct a literature review and summarize state-of-the practice and key findings, including the most recent studies on the use of antioxidants to identify types of antioxidants (generic chemicals as well as any specialized additives) that are effective in reducing oxidative aging in asphalt binders from different sources.</li><li>• Conduct laboratory scale studies on asphalt binders and mixtures to evaluate and verify efficacy of these materials.</li><li>• Conduct a cost and construction feasibility analysis (e.g., delivery of additives during binder or mixture production).</li><li>• Collect input from stake holders including asphalt binder and mixture industry and develop plans for field implementation.</li><li>• Install pilot sections in the field that utilize these materials.</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. Project Summary Report</li><li>4. Research report documenting the findings of this research, including:<ul style="list-style-type: none"><li>• Cost-benefit analysis on the use of one or more feasible antioxidant additives to mitigate oxidation.</li><li>• Results from construction, and monitoring of pilot sections.</li><li>• Value of Research (VoR) that includes both qualitative and economic benefits.</li></ul></li></ol>
<b>Proposal Requirements:</b>	<ol style="list-style-type: none"><li>1. RFP#1 Q&amp;A Deadline: 12:00 p.m. Central Time, <b>Tuesday, February 20, 2024.</b></li><li>2. Proposal Deadline: 12:00 p.m. Central Time, <b>Thursday, March 21, 2024.</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 by the University Liaison 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>. Universities that have not submitted a completed and signed TSQ one week after award will be considered non-compliant and unable to participate in the Program.</li></ol>