



# Research Project Statement 24-162 FY 2024 Annual Program

<b>Title:</b>	Evaluate Effects of Recycled Asphalt Pavement (RAP) on Performance-Graded (PG) Binder Polymer Concentration
<b>The Problem:</b>	<p>Polymer modified binders usually have a polymer threshold where the binder creates a network level and provides greater binder properties. Below this threshold, while the polymer is present, it does not generate higher performance properties. RAP can dilute the polymer content of a PG binder below this threshold and result in a binder that does not perform as well as expected. This can be seen in allowable RAP binder ratios where RAP will dilute the polymer concentration. TxDOT Special Specification 3077, Superpave Mixtures, Table 5, is an example, allowing from 15 to 30 percent recycled binder ratio, where this dilution can result in lesser performing effective binder. This can also happen in binder substitution where a lesser PG grade could be substituted that may be closer to the network polymer threshold already and then also diluted with RAP binder.</p>
<b>Technical Objectives:</b>	<p>This project will explore whether polymer dilution is a problem that should be addressed in TxDOT HMA specifications. If so, addressing polymer dilution would impact HMA performance in rutting and cracking. To meet the project objectives, the research team shall:</p> <ul style="list-style-type: none"> <li>• Conduct experiments with several RAP binders and PG binders to understand if polymer dilution is a problem that should be addressed in the specifications. This would occur through testing polymer modified PG binder, RAP binders, and blends. Testing would include polymer content of the PG binder and diluted blends along with binder properties. Additionally, lab blended PG binders would be included where the threshold level of polymer can be determined and see the effects of dilution.</li> <li>• If polymer dilution is a problem, develop language to address this for mixture specifications.</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 the research, including proposed language in specifications to address dilution.</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>