



FY 2025 Annual Program Research Project Statement 25-024

Title:	Incorporating Lab Skid Measurements into the Balanced Mix Design Process
The Problem:	<p>TxDOT research developed the Balanced Mix Design (BMD) concept around 2005 where the conflicting mix properties of rutting and cracking are measured using laboratory tests and a binder type and content selected which provides satisfactory results for both requirements. The next and final stage of the BMD development is to incorporate a defensible and practical laboratory assessment of skid resistance into the process.</p> <p>TxDOT has been conducting research on predicting skid resistance for over five decades. This research has focused on measuring the polishing resistance of the coarse aggregate portion of mixes. This has led to the development of a surface aggregate classification where the surface aggregate classification A (SAC A) materials are rated as having good skid resistance properties. However, recently it was reported that some mixes with predominantly SAC A materials have low skid resistance. In addition, some of the fine surface mix with little coarse aggregate have been shown to have excellent skid resistance.</p> <p>One conclusion is that the long-term skid resistance of any surface mix is a function of many factors including mix, type, gradation, quality of the fines used, and others not simply coarse aggregate properties. A laboratory test procedure needs to be developed and implemented to measure skid resistance of the proposed mix. This test will eventually be incorporated into TxDOT's BMD.</p>
Technical Objectives:	<p>The objectives of this project are:</p> <ul style="list-style-type: none"> • Conduct a literature review and summarize state-of-the practice and key findings. • Evaluate the available laboratory procedures for manufacturing, polishing and measuring the skid resistance of typical TxDOT surface mixes. • Provide field monitoring data that shows that the proposed system does an acceptable job at predicting in-service skid resistance, allowing for the development of tentative acceptance criteria. • Develop a comprehensive lab testing program to evaluate the most common surface mixes in Texas (SMA, SP, PFC and DG mixes). <ul style="list-style-type: none"> ○ Evaluate the impact of gradations and quality of the fine on measured skid resistance. ○ Compare and contrast the laboratory results from mixes with the current Blended DFT procedure on the mix components. ○ Test the skid resistance of mixes proposed for upcoming district projects; where mixes fail the skid criteria, modify the mix to obtain passing results. <p>The expected technology readiness level (TRL) for this project is 8.</p>
Anticipated Deliverables:	<ol style="list-style-type: none"> 1. Technical memorandum for each task completed. 2. Monthly progress reports. 3. Project Summary Report 4. Research report documenting the findings of this research, including: <ul style="list-style-type: none"> • Recommended defensible test procedures to measure skid resistance on mixes in the laboratory. • Developed test procedures in the TxDOT format, specifying equipment needed, sample prep and testing protocols. • Documented case studies on using the proposed procedure on actual projects. • Implementation recommendations. • Value of Research (VoR) that includes both qualitative and economic benefits.

Proposal Requirements:

1. RFP#1 Q&A Deadline: 12:00 p.m. Central Time, **Tuesday, February 20, 2024.**
2. Proposal Deadline: 12:00 p.m. Central Time, **Thursday, March 21, 2024.**
3. Use the current “ProjAgre” and “PA Forms” templates located at the [RTI Forms webpage](#).
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 [University Handbook](#).
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.
6. This project will be tracked during the life of the project using the Technology Readiness Level ([TRL](#)) scale.
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 RTIMAIN@txdot.gov. 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.