



FY 2025 Annual Program Research Project Statement 25-036

Title:	Predicting Field Performance of Pavement Markings Statewide in Texas
The Problem:	<p>There are more than 50 different materials used for pavement markings across the state of Texas. The current practice is to ensure that the pavement markings meet a minimum retroreflectivity requirement immediately after placement.</p> <p>There is a need to ensure that the overall performance of these markings is preserved over the life of the markings including color, retroreflectivity, and durability/integrity of the marking. To improve the safety of our roads, FHWA has recently established a minimum retroreflectivity requirement that all DOTs should meet by July 2026. To this end, TxDOT needs to be able to estimate the pavement markings performance under different climate and traffic conditions. This research will also investigate the effect of pavement marking thickness and glass bead types on the marking performance and durability.</p> <p>Furthermore, the long-term durability of these markings is estimated for specification and control purposes using accelerated weathering (weatherometer) in a laboratory. However, there are currently no guidelines that connect the duration of weathering and associated mechanical and chemical properties of the markings that are measured in the laboratory to corresponding life and performance in different climatic conditions in the field. The other main goal of this study is to establish this relationship.</p> <p>In addition, this study will evaluate the performance of Raised Pavement Markers (RPMs) which work in combination with the pavement markings.</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. • Identify the most common and high performing materials used for both asphalt and concrete surfaces. • Install test sections in the field at different geographic and climatic regions within Texas, to develop performance models. • Monitor the field performance of these materials in terms of retroreflectivity, color, and integrity, at different time intervals. • Investigate the effect of marking thickness and glass bead type on the marking performance and durability. • Develop laboratory tests correlating well with the field performance in Texas. • Age materials using a weatherometer with different durations of exposure, and measure mechanical and chemical properties, to develop correlations between field and laboratory aging. • Evaluate the effect of bonding between different marking materials and various road surfaces on their performance and durability. <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. General guideline for districts on the types of materials and marking thickness that are best suited for different climatic conditions to address FHWA requirement. 4. Test methods and guidelines for weathering and evaluating materials in the laboratory environment that best predict field performance under different conditions. 5. Update TxDOT Specifications for material approval and acceptance; Including but not limited to DMS-8200, DMS-8220, DMS-8230, DMS-8240, DMS-8241, DMS-8242, DMS-8290, DMS-4200, Item 662, Item 666, Item 668, and Item 672 6. Update TxDOT Pavement Marking Handbook. 7. Project Summary Report 8. Research report documenting the findings of this research, including: <ul style="list-style-type: none"> • Results from materials laboratory and field testing. • Value of Research (VoR) that includes both qualitative and economic benefits.

Proposal Requirements:	<ol style="list-style-type: none">1. The project duration shall not exceed 48 months.2. RFP#1 Q&A Deadline: 12:00 p.m. Central Time, Tuesday, February 20, 2024.3. Proposal Deadline: 12:00 p.m. Central Time, Thursday, March 21, 2024.4. Use the current “ProjAgre” and “PA Forms” templates located at the RTI Forms webpage.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 University Handbook.6. 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.7. This project will be tracked during the life of the project using the Technology Readiness Level (TRL) scale.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 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.
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