

Pavement

MAY 2026

Project Title: Improve Pavement Surface Distress and Transverse Profile Data Collection and Analysis, Phase II, TPF-5(399)

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DRISI provides solutions and knowledge that improves California's transportation system.

Improve Pavement Surface Distress and Transverse Profile Data Collection and Analysis, Phase II, TPF-5(399)

Advancing Nationwide Consistency in Pavement Distress Data Collection and Analysis.

WHAT IS THE NEED?

Over the past five to ten years, the technical capabilities of systems for collecting and analyzing pavement surface distress and transverse profile (PSDATP) data have advanced significantly. Many State Highway Agencies are now evaluating or procuring equipment and vendor services for both network- and project-level pavement condition assessments. High-quality PSDATP data is essential for effective pavement management, design, and performance evaluation.

This study will help unify strategies, support implementation, and promote practices that improve the accuracy, consistency, and understanding of PSDATP data collection and analysis.

WHAT ARE WE DOING?

This study proposes a systematic approach to collect, analyze, and use transverse profile data to identify pavement distress. The Federal Highway Administration (FHWA) will develop a robust methodology to improve data quality and support consistent implementation among state Departments of Transportation (DOTs). The study includes three primary tasks:

- Task 1 – Administration: Assemble a Technical Advisory Committee (TAC). Initial activities include developing a study charter outlining how the TAC will identify needs, propose and select projects, and carry out its responsibilities.
- Task 2 – Identify, prioritize, and select projects as necessary: Identify, prioritize, and select projects for



this pooled-fund study. Potential projects may include certifying and validating existing standards, conducting field evaluations of vendor systems, refining analysis standards for transverse profiles (e.g., water retention), piloting new methods, developing procurement and calibration standards, verifying data accuracy, and exploring emerging technologies.

- Task 3 – Project Execution: Selected projects will be developed into detailed project plans. If a project requires contracting, the plan will serve as the basis for the statement of work.

WHAT IS OUR GOAL?

The study aims to:

1. Develop an accurate, standardized methodology for identifying pavement surface distress using transverse profile data.
2. Establish practical approaches for widespread implementation by state DOTs, including the California Department of Transportation (Caltrans).

WHAT IS THE BENEFIT?

The proposed methodology will improve the accuracy, consistency, and efficiency of pavement surface distress and transverse profile data collection and analysis, supporting better pavement management decisions.

WHAT IS THE PROGRESS TO DATE?

The research team continued progress on improving rut and cross-slope definitions and implementation of TPF-5(299)/(399) pooled fund products. Progress to date includes:

- Completed kickoff coordination and initial panel engagement.
- Completed a literature review on transverse pavement profile (TPP) signal processing and rutting methodologies, developed a structured TPP database, and obtained additional datasets

through vendor coordination to support validation across agencies.

- Implemented and evaluated multiple filtering and smoothing techniques using statistical metrics and power spectral density (PSD) analysis, with refined approaches identified through parameter tuning.
- Advanced coordination with the National Center for Asphalt Technology (NCAT) and multiple vendors for TPP assessment testing, including confirmation of vendor participation and refinement of PP106–PP110 procedures and PP107–PP109 output structure revisions.
- Supported panel review of Technical Memoranda 1.1 and 1.2, pursued vendor image data for the artificial intelligence (AI)-based reference library feasibility effort, and analyzed TPP data workflows to identify gaps in scan registration, strip creation, and data alignment processes.