

TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): FHWA

INSTRUCTIONS:

Project Managers and/or research project investigators should complete a quarterly progress report for each calendar quarter during which the projects are active. Please provide a project schedule status of the research activities tied to each task that is defined in the proposal; a percentage completion of each task; a concise discussion (2 or 3 sentences) of the current status, including accomplishments and problems encountered, if any. List all tasks, even if no work was done during this period.

Transportation Pooled Fund Program Project # TPF-5(019) & SPR-2(174) <i>Full-Scale Accelerated Performance Testing for Superpave and Structural Validation & Accelerated Pavement Testing of Crumb Rubber Modified Asphalt Pavements</i>	Transportation Pooled Fund Program - Report Period: <input checked="" type="checkbox"/> Quarter 1 (January 1 – March 31) <input type="checkbox"/> Quarter 2 (April 1 – June 30) <input type="checkbox"/> Quarter 3 (July 1 – September 30) <input type="checkbox"/> Quarter 4 (October 4 – December 31)	
Project Title: TPF-5(019) SPR-2(174)		
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Lead Agency Project ID: -	Other Project ID (i.e., contract #): -	Project Start Date: January 2002
Original Project End Date: -	Current Project End Date: December 2008	Number of Extensions: -

Project schedule status:

- On schedule
 On revised schedule
 Ahead of schedule
 Behind schedule

Overall Project Statistics:

Total Project Budget	Total Cost to Date for Project	Total Percentage of Work Completed
\$983,697.52 TPF-5(019) + \$500,000.00 SPR-2(174) \$1,483,697.52	\$928,480.10 TPF-5(019) + \$470,972.58 SPR-2(174) \$1,399,452.68	100%

Quarterly Project Statistics:

Total Project Expenses This Quarter	Total Amount of Funds Expended This Quarter	Percentage of Work Completed This Quarter
\$0	\$0	0

Project Description:

(Abstract from Draft Final Report)

The primary objective of this full scale accelerated pavement testing was to evaluate the performance of unmodified and polymer modified asphalt binders and to recommend improved specification tests over existing Superpave Performance Grading methodologies. Candidate replacement tests were evaluated via their ability to discern fatigue cracking resistance and rutting. Two fatigue cracking specification tests were identified as being more capable than others; binder yield energy and critical tip opening displacement. Two rutting specification tests that quantify irrecoverable deformations exhibited the best strength to capture rutting; Multiple Stress Creep and Recovery and oscillatory based non recoverable stiffness.

Based on the full scale performance and laboratory tests, crumb rubber (recycled tires) modified asphalt (Arizona wet process) was shown to significantly slow or stop the growth of fatigue cracks in a composite asphalt pavement structure. A hybrid technique to modify asphalt with a combination of crumb rubber and conventional polymers (terminally blended) exhibited good fatigue cracking resistance relative to the control binder, without any special handling procedures needed for some crumb rubber modified asphalts. Also, a simple addition of polyester fibers to asphalt mix was shown to have high resistance to fatigue cracking without the use of polymer modification.

The research study also quantified the capabilities of NCHRP mechanistic-empirical pavement design and analysis methodologies to predict rutting and fatigue cracking of modified asphalts that were not captured in the calibration data from the Long Term Pavement Performance Program. Falling Weight Deflectometer, multi depth deflectometer and strain gauge instrumentation were used to measure pavement response. The results illustrated that the globally-calibrated mechanistic-empirical performance models could differentiate between structural asphalt thickness but had difficulty differentiating the modified from the unmodified asphalt binder performance. Nonetheless, the mechanistic-empirical performance ranking and predictions were enhanced and improved using mixture-specific performance tests currently being implemented using the Asphalt Mix Performance Tester.

Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):

- The draft final report was edited to provide regulation 508 captions for figures that are descriptive which are required for online FHWA publication of the final report. All FHWA reports are published electronically online and the final report will also be printed as well.
- A cost estimate was received from the editor for the draft final publication which is the last remaining obstacle before starting the process of financial closure for either return remaining funds back to the participating states or some states releasing the funds to FHWA for further experiments.
- A draft test method in AASHTO format was completed for the recommended Double Edge Notch Tension (DENT) for calculated critical tip opening displacement (CTOD)
- A master mold to make DENT CTOD molds to distribute to participants was designed, ordered, fabricated and received. Also, the fabrication of metal tab-fixtures that fit into the mold for the test specimens was fabricated
- The draft final report and PowerPoint slides from the first close-out web webinar were moved to a better ftp folder. <ftp://fhwaftp.fhwa.dot.gov/HRDI/NGibson/TPF519%20SPR2174%20ALF%20PowerPoints%20Draft%20Final%20Report/>

Anticipated work / close-out activities for next quarter:

- A mailing package will be sent to participants containing (1) flexible silicone DENT CTOD molds + metal specimen tabs, (2) test method protocol for review and (3) DVD containing the audio and video of the first technical close out webinar.
- Address the non-technical editorial comments from editor on the draft final report.
- Address the technical comments from the participants on the draft final report.
- Confirm/Schedule for second final close out technical webinar to be held in Q3 which will allow for sufficient planning and final review of draft report by participants.
- Receive all necessary approvals from FHWA CFO for financial close out.

Significant Results:

- The ALF binders were characterized for standard Force Ductility as a requested action item from Texas during first technical close out webinar. Testing is complete and data are being analyzed for comparison to DENT CTOD.
- A section has been added to Chapter 4
- The recommendation of DENT CTOD and statistical methodology utilized in the research was further strengthened using extracted binders characterized from the ALF pavements with and without full-scale accelerated aging. The accelerated aged fatigue cracking and extracted binder allowed the number of data points to be doubled.

Circumstance affecting project or budget (Describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope, and fiscal constraints set forth in the agreement, along with recommended solutions to those problems).