

## TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): Virginia DOT

**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.*

<b>Transportation Pooled Fund Program Project #</b> <i>(i.e., SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX))</i>  TPF-5 (225)	<b>Transportation Pooled Fund Program - Report Period:</b> <input type="checkbox"/> Quarter 1 (January 1 – March 31) <input checked="" type="checkbox"/> Quarter 2 (April 1 – June 30) <input type="checkbox"/> Quarter 3 (July 1 – September 30) <input type="checkbox"/> Quarter 4 (October 1 – December 31)	
<b>Project Title:</b> Validation of Hot-Poured Crack Sealant Performance Based Guidelines		
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<b>Lead Agency Project ID:</b> VCTIR 98160	<b>Other Project ID (i.e., contract #):</b>	<b>Project Start Date:</b> 09/01/2010
<b>Original Project End Date:</b> 09/01/2014	<b>Current Project End Date:</b> 10/31/2016	<b>Number of Extensions:</b> 2 extensions in total for 1.5 years

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	Percentage of Work Completed to Date
730,000 (after revision 885,400)	\$880,979	94% (with updated schedule)

**Quarterly** Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
\$22,949 <sup>1</sup>	\$22,949 <sup>1</sup>	95 % (with updated schedule)

<sup>1</sup> Quarter financial statements are only available until the end of May. Therefore quarter expenditures include April and May.

**Project Description:**

Recently, performance-based guidelines were developed as a systematic procedure to select hot-poured bituminous crack sealants. These guidelines are the outcome of the pool-funded North American Consortium led by the University of Illinois at Urbana-Champaign and the National Research Council of Canada. The work proposed a "Sealant Grade" (SG) system to select hot-poured crack sealant based on environmental conditions. A special effort was made to use the equipment originally developed by the Strategic Highway Research Program (SHRP), which was used to measure binder rheological behavior as part of the Performance Grade (PG) system.

These developed laboratory tests allow for measuring hot-poured bituminous-based crack sealant's rheological and mechanical properties over a wide range of service temperatures. Preliminary thresholds for each test were identified to ensure desirable field performance. Then, the preliminary thresholds were utilized in the SG system based on extensive laboratory testing, limited between-laboratory testing, and limited field performance data.

However, because the preliminary thresholds were determined based on only limited field data, mainly from Canada, a comprehensive field study is urgently needed to validate and fine-tune the present threshold values.

Furthermore, the developed guidelines should be validated in several states under various climate zones.

**Tasks:**

- I. Laboratory Validation
- II. Field testing and installations
- III. Test section monitoring
- IV. Threshold value fine tuning
- V. Cost effectiveness quantification
- VI. Development of crack sealant selection procedures and installation guidelines.

**Objectives:**

The developed laboratory tests and the new guidelines must be verified for precision and bias between laboratories as well as within laboratories. In addition, since preliminary thresholds were established for each test based on extensive laboratory testing but with limited field and within-laboratory data, an extensive field study is urgently needed to validate and fine-tune the threshold values. Hence, this proposed study aims 1) to validate the developed laboratory tests, 2) to determine the thresholds using a more diverse array of field performance data, and 3) to implement crack sealant guidelines for field application.

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

The final meeting for the project was held on April 5<sup>th</sup>, 2016.

**Task-I: Laboratory Validation (100% completed):**

Progress in the laboratory testing is summarized as follow:

- This task is completed and the report is drafted.

**Task-II: Field Testing and Installation (100% completed):**

- This task is completed and the report is drafted.

**Task-III: Test section monitoring (100% completed).**

- This task is completed and the report is drafted.

**Task-IV: Threshold value fine-tuning (100% completed).**

- This task is completed and the report is drafted.

Task-V: Cost effectiveness quantification (100% completed).

- This task is completed and the report is drafted.

Task-VI: Development of crack sealant selection procedures and installation guidelines (80% completed).

- The installation guideline was finalized.
- Sealant selection procedure was finalized.

**Anticipated work next quarter:**

**Significant Results:**

Major findings of the study is described in the final project report and executive summary document. All of the deliverables of the project will be under review during the second extension period by the panel members.

BBR stiffness and adhesion tests showed similar trends indicating the influence of chemical composition on sealant's stiffness and adhesion characteristics. Both tests have good correlation to field performance. This is an important findings to use the BBR test as the pivot test to perform sealant grading as part of a tiered implementation plan.

**Circumstance affecting project or budget. (Please 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).**

An extension was requested to complete the reporting deliverables. According to the new schedule, all deliverable will be under review by VTRC first and panel members after revisions are implemented.

**Potential Implementation:**

Based on the field validation study at various test sites, performance thresholds in Sealant Grade System will be Updated. These thresholds were initially determined based on limited field data. The finalized grade system can be used by States and other agencies for selecting sealants based on climatic region. Sealant field installation guidelines will also be available at the end of this project.

