TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): Minnesota Department of Transportation

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 # *(i.e, SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX)* TPF-5(269)		**Transportation Pooled Fund Program - Report Period:** ☐ Quarter 1 (January 1 – March 31) ☑ Quarter 2 (April 1 – June 30) ☐ Quarter 3 (July 1 – September 30) ☐ Quarter 4 (October 1 – December 31)
Project Title: Development of an Improved Design Procedure for Unbonded Concrete Overlays		
Name of Project Manager(s): Tom Burnham	**Phone Number:** 651-366-5452	**E-Mail** tom.burnham@state.mn.us
Lead Agency Project ID: TPF-5(269)	**Other Project ID (i.e., contract #):** 99008 Work Order No. 83	**Project Start Date:** June 17, 2013
Original Project End Date: May 31, 2016	**Current Project End Date:** May 31, 2017	**Number of Extensions:** 1

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
$441,287	$140,000	40%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
$55,000	$0	58%

Project Description:

This project was created to address the timely need for an improved mechanistic-empirical based design procedure for unbonded concrete overlays of existing concrete and composite pavements (UCOCP).

The objectives of the projects are:

1. Study and understand the field performance history of UCOCP as demonstrated by various test sections and in-service pavements.
2. Determine suitable separator layer (interlayer) materials and properties to insure long term performance of UCOCP systems.
3. Develop a design procedure for unbonded concrete overlays of existing concrete and composite pavements utilizing existing validated performance models, as well as new analytical models derived to address deficient or missing design parameters in existing methods. The design guide will be based on mechanistic-empirical principles, including the effects of various concrete overlay materials, separator layer (interlayer) types, panel thickness (4" to 10"?) and panel size, joint load transfer mechanisms, traffic loads, and climates (nation-wide) in which they must perform.
4. Provide improved or supplemental guidance on the suitability of projects for unbonded concrete overlays.

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

Work this quarter consisted of laboratory testing of beam samples to characterize the behavior of various interlayer materials in relation to reflective cracking. This Task 2 work was documented in a draft report submitted for review by the TAP. On April 22, the contract was amended to accommodate additional testing and add time needed to complete the project. A TAP meeting was held on June 23, 2015 to present and discuss preliminary Task 2 findings.

Anticipated work next quarter:

During Q3 2015, additional beam samples from an unbonded overlay being constructed on SR50 in Bridgeville, PA will be tested in the laboratory. These specimens will be added to those previously tested to add an eighth interlayer to the laboratory study. The strength and stiffness of the existing concrete will be obtained from the field by coring samples and testing according to ASTM C39 and C469. The research team will also review the drainage guidelines for unbonded concrete overlays as well as perform analysis of FWD data. The research team will finalize Task 2 and submit the task report to the TAP.

Significant Results:

Six existing UBOL design procedures were discovered as being relevant to this effort. There is strong interest in packaging the new UBOL procedure developed under this contract, with the recently developed BCOA-ME product from pooled fund TPF 5-165.

The team has done preliminary investigation on data from MnDOT's pavement management system database, which included some valuable longer term performance of UBOLs. This historical information will be very helpful toward the development of the new design procedure.

A new longitudinal cracking model has been developed, which will be important to the development of the new design procedure.

Laboratory test protocols have been finalized for carrying out the testing for two of the three interlayer mechanisms to be studied.

Results form the laboratory testing of beam samples have revealed some interesting behaviors of interlayers under load, particularly with asphalt-based materials.

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).

Delays in subcontracting with the University of Pittsburgh in 2014 required a modification of the original project time line and amendments to the University of Minnesota contract. The contract modifications were completed and approved in April 2015. The project work is slightly behind schedule related to Task 2 work, but the team has stated that work in future tasks will return to the amended schedule.

Potential Implementation:

There is great and immediate demand for the product from this project.

Once the design procedure and guidelines are accepted as viable and reliable by the design community, the implementation will occur very quickly.