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(165)	**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 Design Guide for Thin and Ultrathin Concrete Overlays of Existing Asphalt Pavements		
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(165)	**Other Project ID (i.e., contract #):**	**Project Start Date:** September 2008
Original Project End Date: January 31, 2012	**Current Project End Date:** January 31, 2013	**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
$415,200	$137,770	75%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
$0	$0	80%

Project Description:

This project was created to address the timely need for a rational mechanistic-empirical based design guide for thin and ultrathin concrete overlays of existing asphalt pavements.

The objectives of the projects are:

1. Identify, collect, compile and review available performance data and information on thin and ultrathin concrete overlays of existing asphalt pavements.
2. Evaluate and modify existing structural response models and design methods, or create new ones (if necessary).
3. Implement the effect of climate into the new design method for thin and ultrathin concrete overlays of existing asphalt pavements.
4. Characterize the influences of interlayer bonding and structural fibers on the design and performance of this type of overlay.
5. Develop a user-friendly and comprehensive design procedure and users guide, applicable for designs throughout the U.S.
6. Provide guidelines for project selection (feasibility).
7. Provide guidelines for future rehabilitation of this type of overlay.

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

TASK 3: Two slabs and 35 beam samples were tested in the laboratory to characterize the performance of fiber reinforced concrete overlays. A test was also developed toward developing a bonding model for the design procedure.

TASK 6: A TAP meeting was held on May 24th. The first release of design spreadsheet was demonstrated and discussed. A draft user's guide was also completed and disseminated. There was general consensus by the TAP that additional work should be done to update the cracking models to reflect the true mode of failure. A Phase 1B proposal was written and advertised for additional contributions to the pooled fund.

Anticipated work next quarter:

TASK 3: Laboratory testing will continue on specimens designed to evaluate the time dependent contribution of interlayer bonding and structural fibers in concrete overlays.

TASKS 6: Work on calibration and error detection will continue on first release of design spreadsheet. Work will also continue on the design procedure users manual and guidelines for project selection and pre-overlay evaluations.

A proposal to revise some fatigue models will be assembled and distributed to the TAP for consideration.

Significant Results:

Based on surveys of the field performance of projects throughout the U.S., the dominant types of distress were identified for thin and ultrathin concrete overlays of existing asphalt pavements. Also, the influence of traffic, overlay thickness, panel size, and dowels on overlay performance were analyzed and published in a TRB research paper.

Suitable structural response models have been selected for the new design procedure. Climate regions have been identified that result in different overlay performance.

The primary mode of failure in thin whitetopping has more recently been identified as longitudinal cracking in the outer wheelpath. This finding necessitates revision of the fatigue models used in the first release of the new design spreadsheet.

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).

The contract has been amended to reflect the additional work and costs associated with Tasks 3 and 5. The new contract completion date has extended to January 31, 2013.

Additional work, funds, and time (minimal extension) have been requested by P.I. to update some of the fatigue models currently used in the first release of the design spreadsheet. Of the $75,000 requested for the additional work, so far five states have committed to providing a total of $62,500. The amendment will move forward once one more state commits to the needed funding.

Potential Implementation:

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

The first release of the design spreadsheet is a major advancement over other available design procedures. Some states may adopt the first version, despite the fact that some of the fatigue models used are not fully compatible with observed distress modes. Other states, agencies, and organizations may choose to wait until the fatigue models are revised.

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