**Minnesota Department of Transportation**



**MEMO**

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**DATE:** January 18, 2012

**TO:** TAP members

**FROM:** Tom Burnham, Project Manager

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**SUBJECT:** Minutes from fifth TAP meeting for TPF 5-165 (Transportation Pooled Fund) Project “Design Guide for Thin and Ultrathin Concrete Overlays of Existing Asphalt Pavements.”

The fifth Technical Advisory Panel (TAP) meeting for the Transportation Pooled Fund Project 5-165 “Design Guide for Thin and Ultrathin Concrete Overlays of Existing Asphalt Pavements” was held on October 5, 2011. The meeting took place at the Northland Inn in Brooklyn Park, Minnesota. Conference call problems prevented some TAP members from effectively participating. Tom sent an email to those TAP members that did not attend in person expressing sincere apologies for the phone problems that occurred.

Meeting attendees were:

Julie Vandenbossche – Principal Investigator – University of Pittsburgh

Tom Burnham – TPF Project Manager – Minnesota Department of Transportation

Maureen Jensen – Research Manager– Minnesota Department of Transportation

Nelson Cruz – TPF Administrative liaison - Minnesota Department of Transportation

Bruce Tanquist – Pavement Design - Minnesota Department of Transportation

Steve Henrichs – Pavement Design - Minnesota Department of Transportation

Maria Masten – Concrete Engineer - Minnesota Department of Transportation

John Donahue - TPF state representative – Missouri Department of Transportation

German Claros - TPF state representative – Texas Department of Transportation

Bill Barstis – TPF state representative - Mississippi Department of Transportation

Lydia Peddicord - TPF state representative – Pennsylvania

Matt Zeller – Concrete Paving Association of Minnesota

Unfortunately the list of members participating via Adobe Connect was not recorded, therefore they have not been listed in these minutes.

Meeting Summary

Following introductions from each of the meeting attendees, Julie gave a full review of the status of the project. A copy of the PowerPoint presentation is attached to these minutes.

*Discussion items:*

**Tom** asked why there was no life prediction feature in the design procedure. **Julie** explained that the procedure determines proportional damage. For example, the designer chooses a design period, and the amount of accumulated damage is predicted for that time period.

**Bill** asked why the procedure is not being designed to go directly into DARWin ME. Tom stated that given the unpredictable timeline for implementation of DARWin ME, this project was conceived (in 2008) to produce an independent procedure that would not rely on the adoption of other design procedures. **Julie** stated that it actually would have been easier to directly design the procedure for DARWin ME. Therefore, future integration of the procedure into DARWin ME should be rather easy.

**Tom** asked about the performance of whitetoppings in intersections. Since a lot of the procedure is based on findings from MnROAD test sections on an interstate route (highly channelized traffic), **Tom** wondered if the turning traffic at intersections caused different distress patterns. **John** said that intersections in Missouri have demonstrated good to fair performance so far. He said they develop a certain number of cracks, level out, then continue to perform well enough to remain in service. He pointed out that there are still channelized traffic portions leading into an intersection.

**Julie** stated that she has received a lot of input on whitetopping performance from Randy Riley (Illinois Chapter of ACPA). She said their sections were however newer, and they tended to push design limits.

**German** mentioned that the coefficient of thermal expansion will be lower when fibers are used in whitetopping mixes.

**Julie** reported that whitetopping sections in Colorado have developed longitudinal cracks in the 6 foot x 6 foot panels, similar to those that have occurred in MnROAD cells 60-63 (5L’x6W’ panels). She said field performance of whitetopping suggest that 4 ft x 4ft panels develop corner cracks, while 5L ft x 6W ft or 6 ft x 6ft panels develop a longitudinal crack in the wheelpath. Therefore the failure mode is dictated more by panel size than thickness. She suggested that smaller panel sizes result in additional joints, which provide greater opportunity for water to get to the underlying asphalt, thus resulting in quicker deterioration of the layer bond.

***UPDATE SINCE MEETING: Julie now suggests that the primary failure mode is longitudinal cracking, in both TWT and UTW. Therefore, the structural capacity is more dependent on slab thickness than panel size. While this will not be reflected in the fatigue models used in the March 2012 design spreadsheet release, it will be incorporated into future versions of the program.***

**Maria** asked if the longitudinal cracking observed could be related to shallow centerline or midpanel saw cuts. **Julie** said that while there could be isolated cases, it is not the norm. **John** said that there has been projects where a joint former (“Bob sled”) has been used to form the midlane longitudinal joint. No real problems have been reported using this method.

**Julie** commented that the ACPA “Bonded Concrete Overlay on Asphalt (BCOA) Thickness Designer” web application assumes the only distress type will be corner cracking. Therefore, take this into consideration when using this app for design.

**Julie** described the laboratory work under way at the University of Pittsburgh as part of this project. To determine layer bond deterioration, three methods will be used: wedge splitting tests, double notch tests, and an accelerated load test frame. Julie showed several slides showing the process used to extract fatigued asphalt slabs (from roads undergoing rehab in Pennsylvania) that would be used in the load test frame. **German** commented that texture will affect the bond strength, and should be accounted for in the experiments.

**Julie** next introduced the whitetopping design procedure spreadsheet. While still under development, she described the various features and inputs. She pointed out that the k-value input is currently limited to 400 psi. **German** asked why k-value was still being used in such a design. Julie suggested that most current PCC design models still utilize k-value for simplicity.

**Bill** asked the group whether the project should be expanded in scope, with additional time added. He cited the additional work Julie has added with the load frame testing and other analysis. Tom expressed concern that there is great demand for the product, and that an early version of the program should be released, even if it does not incorporate all the additional design features it will potentially have. Without successful buy-in and approval of an early version, it may be hard for the participating states to ask for additional funds and time.

**Julie** mentioned that there will be three types of fibers incorporated into test slabs for this project. ***Action Item: German said he will send a report to Julie that reports on testing of fibers in concrete.***

**Julie** discussed the development of HMA effects on whitetopping design.

***Action Item: Julie said she will begin work on a proposal to extend the scope and schedule for the project.***

The meeting concluded with group consensus that Julie and her team were doing an excellent job on this project, and that they look forward to the release of the first version of the design spreadsheet in March 2012.