Minutes of Final TAP Meeting for TPF 5(269) Project:
"Development of an Improved Design Procedure for Unbonded Concrete Overlays," September 24, 2019.

Written by: Tom Burnham, MnDOT, 9-25-2019

The eighth and final Technical Advisory Panel (TAP) meeting for the Transportation Pooled Fund Project 5-269 "Development of an Improved Design Procedure for Unbonded Concrete Overlays" was held on September 24, 2019. The meeting was conducted via a web meeting based out of the MnDOT Materials and Road Research Laboratory. The meeting was hosted by Tom Burnham (Project Manager, MnDOT) and the project team members Lev Khazanovich (University of Minnesota), and Julie Vandenbossche (University of Pittsburgh). There were 17 meeting participants:

Jason Waters	Georgia DOT
Chris Brakke	Iowa DOT
Jon Routh	Kansas DOT
Ethan Akerly	Michigan DOT
Maria Masten	Minnesota DOT
Tim Andersen	Minnesota DOT
Tom Burnham	Minnesota DOT
Lowell Flaten	Minnesota DOT
John Donahue	Missouri DOT
Clark Morrison	North Carolina DOT
Julie Vandenbossche	U of Pittsburgh
Lev Khazanovich	U of Pittsburgh
Mark Snyder	PERC
Matt Zeller	CPAM
Tom Cackler	Consultant
Randy Riley	Consultant
Dale Harrington	HCE Services

<u>Agenda</u>

- Roll call
- Project overview (5 minutes) – Tom Burnham
- Presentation on new design procedure (75 minutes) – Project team
- Discussion, Q and A
- Project Wrap-up

<u>Discussion Points</u>

- In his opening project review, Tom warned the group about design thickness comparisons between UNOL and existing design procedures, as the very reason for this project was the lack of completeness and rationality in their approaches.
- Lev stated that while detailed information is contained in the various task reports, the final report sufficiently outlines the theory and efforts expended to create the new design procedure.
- It was highlighted that the current UBOL design procedure in AASHTO Pavement -ME generates erroneous results for some design combinations.
- Julie thanked everyone, in particular the state agencies, for their cooperation and assistance in providing actual concrete samples from projects in the field that could be used for laboratory testing.
- Modeling efforts included scenarios with voids under joints, and the use of Monte Carlo simulations.
- Lev noted that there is little to no information on the long term performance of nonwoven geotextile fabrics used as interlayers in UBOLs.
- Lev stated that dowel bars are very important to utilize in projects subject to heavy and high volume truck loadings.
- Julie explained that they had found an error in the code when dealing with thicker overlays. The issue was related to the stiffness of interlayers and how they were calculated using equivalent thicknesses. The code was recalibrated.

ACTION ITEM: Julie and Lev will update and release a new version of UNOLDesign once all comments and new ideas are considered and addressed.

- Randy and Chris Brakke reported that the output files could not be printed.

ACTION ITEM: Lev will investigate why report printing not always functional in UNOLDesign.

- Tom asked the team whether they considered transverse warp/curl situations when using fabric interlayers that allow full unbonding between layers. Their response was yes, that was considered during the development of the procedure.
- Dale asked whether the procedure was applicable to projects where the underlying concrete was narrower than the overlay. The teams' response was no, the procedure assumes a 12 foot wide, uniformly supported concrete overlay.

- Randy commented that the procedure involved modeling of a model, and wondered whether it was sufficiently calibrated to match real projects. Julie stated that calibration efforts included the use of multiple sources of performance information, including MnROAD and the Michigan DOT.
- Randy asked about the use of a fixed value for coefficient of thermal expansion, given its strong influence on slab behavior. The team suggested the effect of COTE is balanced by other factors, and they chose to reduce the available inputs for simplicity.
- Dale asked about the use of thicker remaining HMA layers (on composite pavements) as interlayers. Julie suggested that if the HMA layers are too thick, they may influence the behavior of reflective cracking, and some cases should then be designed as a bonded concrete overlay on asphalt.
- Dale asked why there was not an interlayer thickness input. The team stated it was again for simplicity.
- Tom asked the team to explain what reliability is assumed when using the UNOLDesign program in design thickness mode. They stated 50% reliability.
- Matt suggested that an ESAL calculator by added to the program. The group agreed that ESALs are still a popular and a better understood characterization of traffic loadings.

ACTION ITEM: Lev will insert an ESAL calculator feature into UNOLDesign before the next realase.

- Chris asked about the Passing 200 sieve in interlayer input. The team explained this has to do with the erodibility of the interlayer.
- Tom asked how access to the UNOLDesign procedure will be handled in the future. It was determined that it would not be a web application (like BCOA-ME) for a while, but in the meantime, a University of Pittsburgh hosted webpage will be created that contains the documentation and a link to download the program.

ACTION ITEM: Lev's team will create a webpage containing a downloadable link to the program, along with all supporting documentation (User's guide, Final report, Guidelines for selecting interlayers, Final TAP meeting Powerpoint presentations, etc...).

- Tom thanked the TAP for their long-term support during this very long duration project, and asked that comments on the procedure and final report be sent to Lev and himself a soon as possible.

Final steps

- Lev's team will assemble comments received by the end of Friday, September 27th, and then revise the UNOLDesign procedure and final task reports.
- The updated final versions of Task 1-4 reports will be submitted to Tom as early as possible the week of September 30th, such that Tasks 1-4 can be closed out. Task 5, publication of the final report, will involve the team working with MnDOT

Research Services to format the report and make it ADA complaint. The final report will be published by November 30th, 2019.

- Lev's team will revise and submit the final version of UNOLDesign to Tom, so he can distribute it to the TAP as soon as it becomes available.
- As mentioned above, a University of Pittsburgh webpage will be created with the procedure available to download, along with supporting documentation.