

## TRANSPORTATION SEMINAR

# Development of a Design Method for Bonded Concrete Overlays of Asphalt and Modeling the Debonding Mechanism

Thursday, October 12, 2017, noon to 1pm

Please join us in College Avenue Commons (CAVC) room 459 



## Julie Vandebossche, Ph.D., P.E.

Associate Professor, University of Pittsburgh

Bonded Concrete Overlays of Asphalt (BCOA) is becoming an increasingly popular alternative for the rehabilitation of asphalt pavements. This is due, in-part, to the development of design tools that have become readily available beginning in 2013 with the release of the BCOA-ME. A subset of the BCOA pavement structures can also now be designed using the AASHTO Pavement ME software. A primary mode of failure for these structures, fatigue cracking, is typically predicated by debonding between the asphalt and the concrete overlay. Partial debonding is assumed to occur in the BCOA-ME design procedure, while the Pavement ME procedure reduces the stiffness of the asphalt layer by 45% to artificially simulate an increase in stress resulting from debonding. Both procedures can benefit from a more rigorous debonding model. To address this limitation, a small scale laboratory studies were conducted to populate a database used in the development of a cohesive zone model in the finite element environment through an inverse analysis. Accelerated loading tests were then conducted on BCOA slabs to simulate the fatigue of the interface bond. This is used to measure the growth rate of the interface debonding so that the framework for a debonding model could be established. The design methodology for the BCOA-ME will be introduced and a summary of the development of the framework for a debonding model will be presented.

Julie Vandebossche is an Associate Professor in the Department of Civil and Environmental Engineering at the University of Pittsburgh. She is a registered professional engineer in the state of Minnesota. Her primary research interests are in the area of cementitious materials and the design, analysis and rehabilitation of concrete pavements. Most of her research pertains to the advanced characterization of materials and the coupling of experimental and computational modeling. She has secured over \$7 million in externally funded research and has over 60 peer-reviewed publications, 60 technical reports and 60 invited presentations. Her research has led to five major awards: the Marlin J. Knutson Award for Technical Achievement (American Concrete Pavement Association), the Fred Burggraf, (Transportation Research Board) and the Bengt Friberg (International Society of Concrete Pavements) and Gene Skoke (Transportation Research Board AFD70) Awards for best paper by a young author and ASCE Professor of the Year, (ASCE Pittsburgh Section).



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