UTC Project Information

Project Title	Incorporation of Pavement Preservation Treatments in Pavement-ME Analysis and Design
University	Michigan State University
Principal Investigator	Syed Waqar Haider, Ph.D., PE. Karim Chatti, Ph.D.
PI Contact Information	Department of Civil and Environmental Engineering 3546 Engineering Building, East Lansing, MI 48824 Tel: (517) 353-9782, syedwaqa@egr.msu.edu
Funding Source(s) and Amounts Provided (by each agency or organization)	$58,741 USDOT $15,861 MSU
Total Project Cost	$74,602
Agency ID or Contract Number	DTRT13-G-UTC44
Start and End Dates	January 31, 2017 to January 30, 2018
Brief Description of Research Project	Currently, pavement preservation is an increasingly widespread practice among agencies interested in extending the lives of their pavements in a cost-effective manner. Highway agencies have learned from the practices that if applied at an appropriate time, pavement preservation provides a means for maintaining and improving the functional condition and slowing deterioration of an existing highway system. While pavement preservation is not expected to substantially increase the structural capacity of the existing pavement, it generally leads to improved pavement performance and longer service life. However, still there are challenges to the success of such practices. These challenges include: (a) identifying good candidate pavements, (b) selecting the best preservation treatments for those pavements, (c) choosing the appropriate treatment timing, and (d) considering preservation treatments in pavement analysis and design stage. Pavement preservation provides a means for maintaining and improving the functional condition of an existing highway system and slowing the rate of deterioration. Therefore, such treatment applications should be considered in the pavement design process. The

	Mechanistic-Empirical Pavement Design Guide (MEPDG) and the AASHTOWare Pavement ME Design software provide methodologies for analysis and design of flexible and rigid pavements. However, these approaches and related performance prediction models focus on new and rehabilitated pavement structures, and do not explicitly consider the contributions of pavement preservation treatments to the overall pavement performance. Thus research is needed to identify approaches for considering the effects of preservation on pavement performance and to develop procedures that facilitate incorporation of pavement preservation treatments in the MEPDG pavement design process. Such procedures will ensure that the contributions of preservation treatments to performance and service life are appropriately considered in pavement design process. The objectives of this project are (a) evaluate the effect of cracking and joint openings on the moisture content in unbound layers, (b) quantify the impact of infiltration and moisture on the strength properties of unbound layers, (c) predict long-term pavement performance based on the unbound material properties to evaluate the impacts of preservation treatments, and (d) develop guidelines for optimum timings of seals for different unbound materials and environmental conditions.
Describe Implementation of Research Outcomes (or why not implemented)	N/A
Place Any Photos Here	
Impacts/Benefits of Implementation (actual, not anticipated)	This work has a potential for immediate implementation in pavement preservation practices and pavement management systems. The results of this study will provide efficient ways to quantify the impact of moisture on material properties. These changes in material properties can be used in the MEPDG to evaluate the effectiveness of the preservation treatments at the design stages.
Web Links • Reports • Project website	<www.chpp.egr.msu.edu>