Research Project Descriptions

UTC Project Information	
Project Title	Development of a SFE Database for Screening of Mixes for Moisture Damage in Oklahoma
University	University of Oklahoma (OU) Oklahoma State University (OSU)
Principal Investigator	PI: Rouzbeh Ghabchi (OU) Co-PI: Rifat Bulut (OSU)
PI Contact Information	ghabchi@ou.edu
Funding Source(s) and Amounts Provided (by each agency or organization)	Oklahoma Department of Transportation
Total Project Cost	$194,043
Agency ID or Contract Number	DTRT13-G-UTC36 OU Subaward # SPTC 15.2-19
Start and End Dates	4/1/2016 – 6/30/2018
Brief Description of Research Project	**PROBLEM**: With recent developments in testing equipment, test methods and studies focused on performance testing, asphalt mix design methods are moving increasingly from empirical to mechanistic. In spite of these developments, the moisture-induced damage (also called stripping) potential of asphalt mixes is generally evaluated using the retained indirect tensile strength ratio (TSR) test or from the stripping inflection point (SIP) in the Hamburg wheel tracking (HWT) test. Although widely used as indicators of moisture-induced damage potential, neither of these tests directly addresses the mechanisms governing stripping of asphalt pavements. A mechanistic approach is needed for screening of asphalt mixes at the design stage to combat moisture-induced damages of pavements that cost millions of dollars annually. A particular area of weakness is screening of mixes containing reclaimed asphalt pavement (RAP) and warm-mix asphalt (WMA). **PROPOSED SOLUTION**: Surface Free Energy (SFE) characteristics of asphalt mixes can be used effectively to quantify bond strength and debonding of aggregate and asphalt binder in presence of water, which cannot be achieved using either a TSR or a HWT test. This study will deliver a SFE database and training for pavement designers for the implementation of this innovative and cost-effective mechanistic approach.
Describe Implementation of Research Outcomes (or why not implemented)	

Place Any Photos Here	
Impacts/Benefits of Implementation (actual, not anticipated)	
Web Links • Reports • Project website	