

Research Project Descriptions

UTC Project Information	
Project Title	Asphalt Binder Rheological Characterization for Extreme Climate Events
University	Texas Tech University
Principal Investigator	PI: Sanjaya Senadheera, Ph.D., Texas Tech University Co-PI: Rajesh Khare, Ph.D., Texas Tech University
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Funding Source(s) and Amounts Provided (by each agency or organization)	SPTC: \$67,010 Texas Department of Transportation: \$67,011
Total Project Cost	\$134,021
Agency ID or Contract Number	DTRT13-G-UTC36 SPTC14.1-64
Start and End Dates	August 1, 2014 – July 31, 2016
Brief Description of Research Project	<p>PROBLEM: Sustained extreme (hot and cold) climate spells result in significant pavement distresses and they appear to occur with increasing frequency. Asphalt is significantly affected by this problem but existing test protocols have not been developed with such extreme conditions in mind.</p> <p>PROPOSED SOLUTION: This research will (1) analyze climate data to predict future weather patterns, (2) relate climate to pavement condition, and (3) use techniques of molecular modeling to elucidate the relationship between asphalt chemical composition and rheological properties. The effect of modifiers on asphalt viscoelastic properties will be of particular focus. Research findings will help build highways that better adapt to new climate realities. The outcomes of this 2-year research will be (i) development of new asphalt modification protocols, and (ii) an updated testing protocol that will evaluate the suitability of modified asphalts for extreme climate scenarios. This research approach will comprise of the following tasks: (1) Review of literature on climate pattern predictions and how climate change will impact highway transportation infrastructure; (2) Laboratory testing of asphalt binders to assess properties with regard to extreme climate events; (3) Determine desired threshold binder property values to withstand possible extreme climate events; and (4) Molecular modeling to elucidate the relationship between asphalt chemical composition, modifier type/dosage/blending procedure and the rheological properties of the binder.</p>

Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	
Impacts/Benefits of Implementation (actual, not anticipated)	
Web Links <ul style="list-style-type: none">• Reports• Project website	.