

UTC Project Information	
Project Title	MPC-373 – Damage Assessment, Characterization, and Modeling for Enhanced Design of Concrete Bridge Decks in Cold Regions
University	North Dakota State University
Principal Investigator	Frank Yazdani, Ph.D. Mijia Yang
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Funding Agencies	USDOT, Research and Innovative Technology Administration
Agency ID or Contract Number	DTRT12-G-UTC08
Project Cost	\$200,000
Start and End Dates	January 1, 2012 – December 31, 2013
Project Duration	2 Years
Brief Description of Research Project	This proposal outlines an approach that will be based on the first principles of mechanics whereby families of general biaxial strength envelopes are developed for concrete decks that are a function of applied stresses and also temperature. A novel approach is then proposed in which for fatigue loadings these surfaces are allowed to collapse or contract inwards thereby predicting the fatigue life of the material. This novel approach is in complete agreement with experimental data that fatigue loading reduces the life of materials. Such design methodology would allow the study of freeze-thaw cycles, such as present in Upper Midwestern states, in a more routine and comprehensive fashion and can indeed be considered as a special low-cycle fatigue issue with tensile stresses or strains present.
Describe Implementation of Research Outcomes (or why not implemented)	
Place Any Photos Here	
Impacts/Benefits of Implementation (actual, not anticipated)	
Web Links	https://www.ugpti.org/resources/reports/details.php?id=815
<ul style="list-style-type: none"> • Reports 	

- Project Website