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| **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 |
| PI Contact Information | Frank Yazdani, Ph.D.  Professor  Department of Civil Engineering  North Dakota State University  Phone: (701) 231-7878  Email: frank.yazdani@ndsu.edu  Mijia Yang  Email: mijia.yang@ndsu.edu |
| 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   * Reports * Project Website | https://www.ugpti.org/resources/reports/details.php?id=815 |