

## Research Project Descriptions

UTC Project Information	
Project Title	<b>Rapid and cost-effective rehabilitation alternatives for transportation infrastructure affected by extreme conditions</b>
University	University of New Mexico
Principal Investigator	PI: Vanessa Valentin, University of New Mexico (UNM)
PI Contact Information	vv@unm.edu; 505-277-0811
Funding Source(s) and Amounts Provided (by each agency or organization)	SPTC: \$75,000 University of New Mexico: \$75,000
Total Project Cost	\$150,000
Agency ID or Contract Number	DTRT13-G-UTC36 SPTC 15.1-50
Start and End Dates	1/1/17 - 12/31/17
Brief Description of Research Project	<p><b>PROBLEM:</b> As a result of climate change, existing transportation infrastructure is being affected by unprecedented extreme weather/climate events such as wildfires. Proper planning for potential risk mitigation alternatives could help increase the resilience of the transportation network by decreasing the recovery time and disruptions to the community. However, due to the uncertainty of extreme events and limited budgets, it is a challenge for state DOTs to preemptively decide and prioritize among mitigation options and execute them in a timely manner after an event.</p> <p><b>PROPOSED SOLUTION:</b> This study will provide methods to quantify, manage and decrease the vulnerability of transportation infrastructure - specifically bridges and drainages - to wildfires. The specific objectives of this study are to: (1) Identify post-wildfire flash flood impacts, and risk mitigation and rehabilitation alternatives for bridges and drainages, (2) Evaluate sensitivity of hydrology model to site-specific input data and identify transportation infrastructure components at risk, (3) Estimate life-cycle cost and implementation time of mitigation and rehabilitation alternatives, and (4) Develop a decision-support tool for prioritizing and deciding among rehabilitation options. The decision support tool will result in the selection of cost-effective mitigation/rehabilitation options. The proposed framework combines the use of GIS, hydraulics model, life-cycle cost assessment and optimization, and will current watershed and soil conditions. The system will take into account the characteristics and criticality of the bridges and drainages, the type of rehabilitation</p>

	<p>alternative (e.g., permanent vs. temporary), characteristics of rehabilitation and mitigation alternatives (including advantages and challenges), and additional factors identified throughout the study. The framework will also incorporate the use of the “Climate Change &amp; Extreme Weather Vulnerability Assessment Framework” from the Federal Highway Administration. The results can be immediately implemented through the proposed decision support tool, which can be used by decision-makers to manage and reduce the risks associated with fires. Additionally, a report on post-wildfire mitigation and rehabilitation best practices will be produced.</p>
<p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p>	
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	
<p>Web Links</p> <ul style="list-style-type: none"> <li>• Reports</li> <li>• Project website</li> </ul>	