



UTC Project Information	
Project Title	Risk and Resilience of Bridges: Toward Development of Hazard-Based Assessment Framework, Research Needs, and Benefits of Accelerated Construction
University	Florida International University University of Oklahoma University of Nevada, Reno
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Funding Source(s) and Amounts Provided (by each agency or organization)	\$30,000 for FIU with \$15,000 matching fund \$50,000 for OU with \$25,000 matching fund \$40,000 for UNR with \$20,000 matching fund
Total Project Cost	\$120,000 from ABC-UTC \$60,000 from match funding Total Fund: \$180,000
Agency ID or Contract Number	69A3551747121
Start and End Dates	03/1/2021 - Active
Brief Description of Research Project	Transportation networks are modeled in the form of links and nodes. Links represent the highways, while the nodes representing bridges connecting the highways which act as hubs for several links. Closure of a single bridge within the transportation network can lead to substantial disruption to the entire network. For example, the local damage of the I-65 North overpass bridge in Alabama in January 2002 (due to truck accidental explosion) caused a traffic interruption for almost 50 days. Assessment of risk and resilience of existing bridges and new bridges, including ABC bridges, accelerated upgrade, and accelerated repair is important to devise pre-hazard preparedness plans and post-hazard mitigation response strategies and recovery time. This project seeks to document and synthesize the current state of practice related to assessment of risk and resilience of bridges and other structures and conducting target surveys to identify the current state of practice with transportation agencies and cities. The collected information will be utilized to develop holistic resilience and risk assessment framework for

	<p>existing and new bridges, including ABC bridges, accelerated upgrade (enhanced robustness), and accelerated repair (enhanced rapidity), under multi-hazards to emphasis on accelerated construction benefits. Finally, the project will develop a specific resilience framework for seismic hazard. Other hazards will be developed in future research opportunities. The success of this project will promote ABC nationwide to stakeholders as the most suited construction method for resilient bridges and transportation infrastructures. The objectives include:</p> <ol style="list-style-type: none"> 1- Documenting the current state of practice related to assessment of risk and resilience of bridges nationally and internationally. 2- Synthesizing the state of practice related to assessment of risk and resilience of other structures (such as buildings and nuclear facilities) against man-made and natural hazards with the goal of identifying frameworks and assessment tools can be readily adopted for bridges. 3- Conducting target online survey for state DOTs and cities to evaluate the practice and efficacy of existing bridge performance tools. 4- Developing a holistic resilience and risk assessment framework for existing and new bridges, including ABC bridges, accelerated upgrade, and accelerated repair, under multi-hazards to emphasis on accelerated construction benefits, and 5- Developing a specific resilience framework for seismic hazard as an example of natural hazards. The success of this project will motivate the multi-institutional team to continue seeking funds in Cycle 5 and from other sources to complete the entire framework for different hazards such as flooding, fire, tsunami and chronic environmental stressors.
<p>Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here</p>	<p>Presentation planned at the Oct 2022 Oklahoma Transportation Research Day</p>
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	<p>The impacts will be tracked and reported once they are identified.</p>
<p>Web Links</p> <ul style="list-style-type: none"> • Reports • Project website 	<p>https://abc-utc.fiu.edu/research-projects/risk-and-resilience-of-bridges-toward-development-of-hazard-based-assessment-framework-research-needs-and-benefits-of-accelerated-construction/</p>