ACCELERATED BRIDGE CONSTRUCTION
UNIVERSITY TRANSPORTATION CENTER

UTC Project Information	
Project Title	Integrated Flood and Socio-Environmental Risk Analysis for Prioritizing ABC Activities
University	Florida International University
Principal Investigator	Dr. Ali Ebrahimian
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Funding Source(s) and Amounts Provided (by each agency or organization)	ABC-UTC Funds: $50,000 Match Funds: $25,000
Total Project Cost	$75,000
Agency ID or Contract Number	69A3551747121
Start and End Dates	03/01 2021 - Active
Brief Description of Research Project	The need to accelerated bridge construction (ABC) activities due to flooding (e.g., accelerated bridge upgrade prior to flood events and accelerated bridge repair after flood events) has complex interdependencies with many physical, social, and environmental factors in urban areas. Flood related factors can also contribute to bridge scour, the biggest cause of bridge failure in the United States. Due to the limited available budget for accelerated upgrade/repair processes, a decision support tool is needed to prioritize bridges in terms of the vulnerability of bridge location and risk level of each bridge to support decision makers in project selection. This study aims to develop a GIS-based, multi-criteria, and multi-stakeholder decision analysis framework that can be used as a risk-based decision support tool for prioritizing ABC activities in the presence of limited budgets. The applicability of the framework will be demonstrated for the selection of accelerated bridge upgrade/repair projects in Miami-Dade County, Florida. The proposed decision support tool will be simple enough to be used in real projects, yet systematic and structured to be adjusted and implemented in different geographic locations. Also, it will be capable of group decision making to be used in projects with multiple stakeholders. The objective of this study is to develop a multi-criterion, multi-stakeholder decision analysis framework in geographic information systems (GIS) environment to assess the vulnerability of urban areas and risk of bridges against flooding and socio-environmental factors. The framework can be used as a decision support tool for selecting accelerated bridge upgrade or accelerated

	bridge repair projects by decision makers. As a case study, the developed framework will be used for a risk-based prioritization of existing bridges in Miami-Dade County with the purpose of selecting projects for accelerated bridge upgrade or repair.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	Invited speaker to make a presentation to St Louis Chapter of virtual ASCE-EWRI 2022 Environmental and Water Resources Symposium/Workshop, March 11, 2022
Impacts/Benefits of Implementation (actual, not anticipated)	The impacts will be tracked and reported once they are identified.
Web Links • Reports • Project website	https://abc-utc.fiu.edu/research-projects/integrated-flood-and-socio-environmental-risk-analysis-for-prioritizing-abc-activities/