



**Project Requirements Form USDOT**  
**CREATE UTC Contract Number 69A3552348330**  
**Center Lead: Texas State University; Texas A&M University**

<b>0Research Project Name:</b> Risk-based assessment of ports and interconnected networks subjected to coastal hazards
Improving the Durability and Extending the Life of Transportation Infrastructure
<b>Principal Investigator:</b> Maria Koliou, Ph.D., maria.koliou@tamu.edu, 0000-0002-0686-493X, TX A&M University, 979-845-4469
<b>Project Partners:</b> N/A
<b>Research Project Funding:</b> Federal: \$69,985      Match: \$35,148 (TAMU)
<b>Project Start Date:</b> 09/01/2024 <b>Project End Date:</b> 05/31/2026
<b>Project Description:</b> Creating a more durable transportation system has been identified as a priority by public and private organizations to address the risks of extreme weather events. Ports play an important role in the economy of coastal communities across the Gulf Coast and they are significantly impacted by weather-related events. This project will focus on addressing issues related to the durability and recovery of port infrastructure in the Gulf coastal regions subjected to weather-related hazards and propose/optimize mitigation strategies.
The proposed research has three main tasks focusing on probabilistically evaluating the durability of port infrastructure accounting for system interdependencies. The tasks will involve (1) assessing the damage of ports and related transportation networks to weather-related hazards. Selected testbeds in the Gulf Coast will be identified and investigated in this study. (2) Assessing the economic impacts (direct and indirect) imposed by extreme weather events on the waterways, port facilities, and port inland connectivity. (3) Proposing mitigation strategies for decision makers to adopt to increase the durability and recovery time of port infrastructure and interconnected networks particularly in the face of coastal hazards and how to prepare for future events.
<b>US DOT Priorities:</b> The outcomes of this project will lead to decision-making plans and future mitigation strategies for existing port infrastructure and interconnected networks in order to preserve the existing transportation system and promote safety in their operation (aligning with DOT research priorities). These outcomes will be in a form to be immediately applicable by local authorities and jurisdictions in the Gulf Coast and will be extendable elsewhere. More specifically, the proposed activities and expected outcomes of this project are anticipated to address strategic goals identified in the US DOT Strategic Plan and Progress Report related to <b>Safety and Transformation</b> .
We will assess damage to ports and interconnected transportation infrastructure subjected to weather-related hazards and investigate their existing conditions to evaluate their safety in terms of injuries and fatalities. To transform our transportation systems to be designed for the future to serve everyone in decades to come, we will propose and investigate mitigation strategies to be adopted by decision-makers with a focus on reducing economic losses, injuries, fatalities, downtime/closure of critical transportation components and improving the mobility of people and goods. Those mitigation solutions will account for future extreme weather events to ensure that we are developing durable transportation systems.



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**Outputs:** The proposed work will be documented in the final report in a manner to ensure that it is well utilized and referenced when DOTs develop and implement the proposed strategies. The team will present and disseminate the research outcomes extensively to facilitate its implementation, including presentations at conferences (e.g., TRB).

**Outcomes/Impacts:** This project is expected to produce much-needed data and analyses to provide decisions to be adopted by ports located on the Gulf Coast and enhance transportation network durability. There is a potential for the proposed study to develop a network interdependency framework specific to transportation durability that can be patented as a novel research idea.

The findings of the project will be disseminated through educational and research channels, including presentations to graduate and undergraduate courses, presentations to local, state and national technical conferences (including but not limited to American Society of Civil Engineers (ASCE)/Structural Engineering Institute (SEI) Structures Congress, and Annual Transportation Research Board (TRB) Meeting), publications to refereed journals and presentations in technical committee meetings (including but not limited to ASCE/SEI Performance-Based Design for Structures Committee).

**Final Research Report:** URL to final Report will be provided upon completion.