



Project Requirements Form USDOT

CREATE UTC Contract Number 69A3552348330

Center Lead: Texas State University; University of Puerto Rico Mayaguez

Research Project Name: Resilience Based Decision Support System for Critical Transportation Corridors

Improving the Durability and Extending the Life of Transportation Infrastructure

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Project Partners:

Puerto Rico Local Technical Assistance Program (LTAP) Center, the UPRM Coastal Resilience Center (CRC), the RISE-UP initiative at UPRM, and the Municipality of Isabela.

Research Project Funding:

Project Start Date: 09/01/2024 **Project End Date:** 08/31/2026

Project Description:

A comprehensive methodology for developing a decision-making support tool is proposed that assesses risks for transportation corridors, with a particular focus on infrastructure and services to support the blue economy. Central to this approach is the integration of coastal considerations into the Vulnerability Assessment Scoring Tool (VAST) and its application within vulnerability assessments. By augmenting VAST with a Coastal Category, the methodology aims to illuminate disparities and highlight vulnerable populations, ensuring their representation in decision-making processes. Through the inclusion of indicators such as income levels, disability prevalence, and accessibility during extreme events, the Coastal Category within VAST enables a nuanced understanding of vulnerability within coastal communities. Ultimately, by addressing coastal disparities head-on, this methodology not only enhances the accuracy and effectiveness of vulnerability assessments but also advances broader goals of resilience in coastal transportation planning.

US DOT Priorities:

This project supports US-DOT goals of Preserving the Existing Transportation System and Improving the Mobility of People and Goods and Promoting Safety. This project will advance knowledge and embrace disruptive technologies, to offer economic, sustainable, and societal benefits to coastal communities, by addressing current and impending challenges related to extreme weather and its impact on the quality and condition of the transportation network of infrastructure components and services.

Risk and Vulnerability Assessment: By using VAST to identify and evaluate the risks associated with extreme weather events in transportation corridors, the project contributes to strengthening the safety of transportation infrastructures. This allows authorities to anticipate and mitigate potential failures, ensuring that the transportation system can better handle emergency situations and protect communities and assets.

Outputs:

A Coastal Category will be created to integrate into the Vulnerability Assessment Scoring Tool (VAST). This category will be assessed using several key indicators:

- Income and Poverty Levels
- Percentage of People with Disabilities



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- Availability of Transportation Modes
- Effectiveness of Transportation Modes During Extreme Events
- Number of Alternative Routes
- Community Knowledge of Evacuation Routes

Collaboration with the Puerto Rico Local Technical Assistance Program involves hosting seminars and workshops focused on vulnerability assessment of transportation infrastructure. These technology transfer events aim to educate local officials on how to effectively apply VAST, including the computational and analytical processes required, as well as the identification of stressors and indicators used in the methodology. Additionally, case studies developed in this study will be showcased to provide practical examples. An additional topic for the workshops will be how to integrate coastal considerations into the identification of resilient solutions to improve accessibility for the population. Collaboration with the professional organizations will enhance the quality and impact of these training events.

Outcomes/Impacts: An analysis of coastal transportation corridor vulnerabilities is crucial to understanding who is most affected by extreme natural events. This analysis advocates for measures that help identify vulnerabilities in coastal transportation infrastructure and services, integrate considerations for the blue economy, and employ visualization tools to enhance the resilience and durability of coastal transportation infrastructure in response to the impacts of extreme natural events. Furthermore, an assessment of vulnerabilities in transportation infrastructure can lead to a more effective allocation of funds for maintenance, reconstruction, or new developments. By ensuring that resources are directed to areas most in need, such assessments can help reduce the marginalization of vulnerable communities, ensuring that all populations receive equal representation in disaster response and recovery efforts. Ultimately, this approach promotes a more resilient infrastructure system that better serves all people, especially those historically underserved or disproportionately impacted by natural disasters in coastal communities.

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