Research Project Name: Role of emerging transportation technologies and safety initiatives in mitigating crashes in coastal communities (TXST)

Improving the Durability and Extending the Life of Transportation Infrastructure

Principal Investigators:
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Project Partners: Texas Department of Transportation (TxDOT)

Research Project Funding:
Federal: $79,909 Match: $45,071 (TxDOT/TXST)

Project Start Date: 1/1/2026 **Project End Date**: 12/31/2026

Project Description: Coastal communities face heightened crash risks due to hazards such as hurricanes, flooding, and roadway degradation. Traditional safety countermeasures often fail to address these compounded risks, especially where evacuation routes are limited. This project will investigate how emerging transportation technologies (e.g., connected vehicle systems, ADAS, smart corridors) and safety initiatives (e.g., hazard-responsive traffic management, roadway design measures) can mitigate crash risks in coastal regions. Using literature review, geospatial screening of coastal corridors, and expert validation, the team will develop a prototype decision-support tool linking crash scenarios common in coastal environments with candidate technologies and initiatives. The outcome will provide agencies with a concise, practical framework to assess and prioritize safety solutions that improve infrastructure durability and resilience under coastal hazards.

US DOT Priorities: *Section left blank until USDOT's new priorities and RD&T strategic goals are available in Spring 2026.*

Outputs: The project will deliver a prototype decision-support tool and guidelines for evaluating emerging transportation technologies and safety initiatives in coastal communities. These outputs will provide agencies with actionable methods to link crash scenarios with candidate technologies, supporting more durable and resilient roadway infrastructure. All data, code, and analytic templates will be released under the open-access licenses on Zenodo to ensure transparency, interoperability, and reusability. New partnerships will be established with regional and state DOTs, metropolitan planning organizations, and coastal safety stakeholders, who will be engaged to validate the tool and ensure its applicability in real-world contexts.

Outcomes/Impacts: The research will produce a validated prototype decision-support tool and practical guidelines that agencies can use to prioritize emerging safety technologies and initiatives in coastal regions. These outputs are expected to change practice by providing transportation agencies with a replicable method to link crash scenarios with hazard-ready countermeasures. The anticipated impacts include enhanced roadway safety, improved reliability of evacuation and travel during hazard events, and extended durability of infrastructure exposed to coastal stressors. By enabling more efficient allocation of resources and guiding hazard-resilient investments, the project will reduce long-term costs associated with infrastructure degradation and crash-related losses.

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