



Project Requirements Form USDOT
CREATE UTC Contract Number 69A3552348330
Center Lead: Texas State University; Oregon State University

Research Project Name: Vehicular Safety During Wave-Overtopping of Coastal Highways	
Improving the Durability and Extending the Life of Transportation Infrastructure	
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Project Partners: U. Puerto Rico Mayaguez	
Research Project Funding:	
Federal: \$50,000	Match: \$50,000 (OSU)
Project Start Date: 10/1/2023	Project End Date: 12/31/2024
Project Description: Coastal highway embankments can be subject to over-topping from waves during strong coastal storms impacting the safety and efficiency of vehicles and causing scour that can undermine the highway. Overtopping is of increasing concern due to sea level rise and climate changes to the intensity, duration, and number of storm events. Using test data from recent wave overtopping experiments conducted at the Hinsdale Wave Research Laboratory at Oregon State University, this study will assess safety of different types of vehicles coincidentally travelling on coastal highways subjected to overtopping. The test data included in this research are different combinations of wave forcing conditions and still water levels. Both grey infrastructure designs of embankments and a seaward nature-based wave attenuation design that used synthetic mangroves, will be considered. Applying different thresholds of overtopping conditions based on existing design standards (USACE Coastal Protection Manual), temporally variable system safety reliabilities will be evaluated. The temporal reliability is especially of interest for nature-based designs whose properties vary over the design life. Results can be used to evaluate safety probabilities of conventional designs and nature-based designs including the influence of sea level rise.	
US DOT Priorities: The proposed project supports the following <i>US DOT strategic goals</i> and <i>research priorities</i> : <i>Safety</i> – by making transportation infrastructure safer for all people using <i>Data-Driven Systems</i> ; and <i>Economic Strength and Global Competitiveness</i> – by creating and preserving <i>Resilient Supply Chains</i> reliant on coastal highways subjected to wave-overtopping.	
Outputs: The results of this work will develop new methods for evaluating the safety of the traveling public on highway embankments subjected to wave overtopping. The work will include partnerships with UTC member U. Puerto Rico Mayaguez, designers from engineering firms, and state transportation agencies.	
Outcomes/Impacts: The work will develop new methods of practice to allow engineers to evaluate existing designs and enable adaptations that will improve user safety while preserving transportation infrastructure assets subject to wave-overtopping.	
Final Research Report: URL to final Report will be provided upon completion.	