

<b>Submission Date:</b> December 2, 2024
<b>Lead Recipient/Grant Number:</b> University of Arkansas / 69A3552348331
<b>Principal Investigator Institution:</b> Texas A&M Transportation Institute
<b>Center Name:</b> Maritime Transportation Research and Education Center
<b>USDOT Research Priority:</b> Preserving the Existing Transportation System
<b>Primary USDOT Strategic Goal</b> ( <i>select drop down</i> ): Safety
<b>Principal Investigator(s) with ORCID(s) and Contact Information:</b> C. James Kruse (ORCID ID 0000-0002-7519-161X)— <a href="mailto:j-kruse@tti.tamu.edu">j-kruse@tti.tamu.edu</a> — 713-613-9210 Mary Beth Hueste (ORCID ID 0000-0002-6259-6298)— <a href="mailto:mhueste@civil.tamu.edu">mhueste@civil.tamu.edu</a> — 979-845-1940 Stefan Hurlebaus (ORCID ID 0000-0002-1720-4208) — <a href="mailto:shurlebaus@civil.tamu.edu">shurlebaus@civil.tamu.edu</a> — 979-845-9570
<b>Project Partners:</b> N/A
<b>Project Type</b> ( <i>select drop down</i> ): Applied Research
<b>Project Research Topic Type</b> ( <i>select drop down</i> ): Maritime Sustainable and Resilient Infrastructure
<b>Transportation Modes Involved</b> ( <i>check all that apply</i> ): <input checked="" type="checkbox"/> Waterway <input checked="" type="checkbox"/> Road <input type="checkbox"/> Rail <input type="checkbox"/> Pipeline <input type="checkbox"/> Other
<b>Research Project Funding:</b> \$71,500 will come from MarTREC funds and \$61,000 will be matching funds, for a total of \$132,500.
<b>Project Start and End Dates</b> (Format month/day/year to month/day/year): 01/01/2025 to 5/31/2026.
<b>Project Title:</b> Vulnerability Assessment of Bridges Crossing Major US Rivers in Support of a Safe and Resilient Transportation System
<b>Project Abstract (Brief Description):</b> This project will assess and evaluate the vulnerability of bridges on major inland waterways to allisions. The project will compile and synthesize the inventory of vehicle bridges across the Mississippi, Columbia, and Ohio Rivers. A list of allision incidents from 2003-2024 will be compiled using Coast Guard marine casualty reports. Based on the latest requirements for design of bridges to withstand allisions, the project will identify the bridges that are most vulnerable. The project will review options for bridge protection, considering bridge strengthening versus replacement. An estimate of annual barge traffic passing under the bridges will be used to indicate criticality.
<b>USDOT Priorities:</b> <i>Describe how the project supports US DOT priorities and the RD&amp;T strategic goals. Also describe how the project engages in breakthrough, advanced, or transformative research.</i> Ensuring the safety of the national transportation network requires an understanding of the vulnerabilities that may disrupt transport both in waterways and within the infrastructure that interacts with these systems. Several major allisions with bridges have happened over the last 2 decades. These allisions have resulted in fatalities, substantial economic impact, and inconveniences to the traveling public. it is essential to assess and understand the vulnerabilities of bridges to allisions to reduce the risk of allisions and promote a safer and more resilient transportation network that supports multimodal supply chains.

**Outputs (results of the work performed):** Describe what new research, technology, or process this research project is expected to produce or has produced. The outputs could include processes and methods; data, hardware, software and databases; invention disclosures, patent filings, inventions, etc. Also describe any new partnerships outside of the UTC consortium that may be established or have been established through the project.

Planned deliverables include: 1. Inventory of bridges on the three rivers being studied 2. Listing of bridge allisions on these rivers from 2003-2024. 3. Listing of bridges most vulnerable to allisions. 4. Discussion of potential bridge protection options. 5. Final Project Report documenting the work performed, methodologies, outcomes, and suggested next steps.

**Outcomes/Impacts:** Describe the application of the output and any changes this output has or will make to the transportation system, or its regulatory, legislative, or policy framework, including a description of products or patents, or a change in practice, or instances of research results informing policy decisions. Discuss how this research output will positively impact the transportation system in terms of safety, reliability, durability, costs, etc.

This project will provide information that is currently lacking in the evaluation of potential bridge strikes. This will allow the Coast Guard, US Army Corps of Engineers, and local governments to target and work on the highest priority bridges.

**Technology Transfer Activities:** Describe planned activities that will make research results available to potential users in a form that can be implemented, utilized, commercialized or otherwise applied. What percent of the budget

An executive summary will be provided. The Transportation Research Board will be consulted regarding opportunities to present the project findings through webinars, presentations at the annual meeting, or conferences throughout the year. We plan to spend 10% of the budget on technology transfer activities.

**Final Research Report:** Upon completion of the project, provide a URL link to final report will be provided

**Project Deliverables:**  PI agrees to submit all deliverables within 4 weeks after the project end date.

**Data Management Plan (DMP):**  PI has reviewed and agrees to adhere to MarTREC DMP. Proposed project DMP must be attached to the submission email along with this form.

**Center Director Approval Signature and Date:**



01.02.25