BIL MarTREC Tier 1 UTC Project Request Form
Completed form should not exceed 2 pages
Return to Amy Shell at shell@uark.edu

Submission Date: 03/06/2025
Lead Recipient/Grant Number: University of Arkansas / 69A3552348331
Principal Investigator Institution: Jackson State University
Center Name: Maritime Transportation Research and Education Center
USDOT Research Priority: Preserving the Existing Transportation System
Primary USDOT Strategic Goal (*select drop down*): Safety
Principal Investigator(s) with ORCID(s) and Contact Information: Dr. Jessica Murphy, Ph.D., (ORCID # 0000-0001-8340-4163) Jessica.l.murphy@jsums.edu, 601) 979-1145
Project Partners: The National Weather Service, MS Emergency Management Agency, Jackson Fire Department, JSU Public Safety, MS Urban League, Engineer Research and Development Center
Project Type (select drop down): Education and Workforce Development
Project Research Topic Type (select drop down): Disruption Response and Transportation Planning for Coastal and River Valley Communities
Transportation Modes Involved (check all that apply): ☒Waterway ☒Road ☐Rail ☐Pipeline ☐Other
Research Project Funding: Federal funding**: $60,000,** non-Federal funding: **$30,000** from Jackson State University, Total funding amount: **$90,000**, funding for planned Technology Transfer activities: **$45,000**
Project Start and End Dates: 07/01/2025 to 05/31/2026
Project Title: Community Resilience in Emergency Advanced Transport Education -The Next Frontier
Project Abstract (Brief Description): The Community Resilience in Emergency Advanced Transport Education -The Next Frontier project's goal is to assist the State of Mississippi create education, training, and preparedness for transportation emergency response for professionals and communities regarding weather considerations. Moreover, the Community Resilience in Emergency Advanced Transport Education -The Next Frontier project will help local Emergency Management professionals, educators, public and private organizations, and the community increase preparedness and response initiatives through advanced disaster simulation technology training and mobile app development. This will enhance discussion-making and critical thinking and help to decrease response time when weather is a major factor during an emergency transportation event.
USDOT Priorities: The Community Resilience in Emergency Advanced Transport Education -The Next Frontier project supports US DOT priorities of promoting safety during inclement weather events, reducing congestion, and improving the mobility of people This project will promote safety through mobile app early notifications and alerts to both Emergency Management professionals and communities and education on how to interpret alerts. To further promote safety during inclement weather events and reduce traffic congestion the following activities will be incorporated: 1) The development and incorporation of a mobile app with evacuation routes, traffic alerts, shelter locations, etc. for weather events, and 2) The simulation technology training will help Emergency Management response professionals further enhance response initiatives (i.e. decrease response time and weather considerations impacting response to determine alternate routes) through interactive simulated emergency incident weather scenarios. The simulation training will enhance efficiency and promote timely response in a safe environment. The RD&T strategic goals are encouraged through applied science and research through technology development and implementation through the app

development and the simulations training scenarios. The advanced training and data attained through pre- and post-surveys and interviews will help transform emergency response transportation consideration for Emergency Management professionals and the community.

Outputs (results of the work performed): Artificial Intelligence has been around for decades. However, the integration of AI in a broader spectrum is becoming more prevalent and is a growing consideration in Emergency Preparedness and Response. Our research will focus on emergency transportation for Emergency Management professionals and AI used in the Advanced Disaster Management System (ADMS) at Jackson State. ADMS is an unscripted and open-ended virtual reality simulator; the outcomes are based on the users' decisions, and the user will experience the consequences of decisions, good or bad. ADMS relies on physics-based technology and built-in artificial intelligence to provide a true-to-life experience set in real-time. The results of decisions for emergency response and emergency response executions during the ADMS training will be produced at the end of the training exercise through the virtual training platform. Participants can further enhance decision-making and considerations regarding traffic volume and traffic flow with inclement weather considerations. The participants (e.g., Emergency Management professionals and community members) will aid in research initiatives through pre-surveys (how do they deem their preparedness and response) before training on ADMS and post-surveys (how they deem themselves improving after completing simulations training). Simulated scenarios generated can include both roadways and waterways in which to demonstrate emergency response considerations with weather factors to promote safe and sustainable mobility. Through interviews, participants can provide feedback to help enhance training focused on transportation issues surrounding weather events. In addition, the Mobile App provides another tool for early weather notification and updates. Research from this endeavor can assist our teams in better understanding transportation needs (evacuation routes, weather forecasts, driving conditions, directions to shelters, alternate routes, etc.). Such information can be placed in the App to better assist the community and our professionals.

Outcomes/Impacts: Regarding the Advanced Disaster Management System (ADMS), participants (e.g., Emergency Management professionals and community members) can further enhance decision-making and considerations regarding traffic volume and traffic flow with inclement weather considerations. This can be achieved through the engagement of natural and man-made disaster scenarios in which participants must make vital decisions in emergency response. Participants will engage in tabletop discussions and identify lessons learned for continuous emergency response improvement when considering weather and transportation. As aforementioned, the Mobile App provides another tool for early weather notification and updates. Research from this endeavor can assist our teams in better understanding transportation needs. Overall, the safety and reliability of both the simulation training and app are forms of technology that will lead to minimizing loss of life and property.

Technology Transfer Activities: This project aims to host at least two ADMS training sessions with community and Emergency Management professionals. hands-on training and obtaining a higher-level experience that makes ADMS an effective tool for planning, rehearsing, assessing, and enhancing the skills of any individual, team, or organization with a role in the incident and disaster management or response. The APP development promotes early notification and provides information regarding weather and transportation considerations through emerging technologies.

Final Research Report: Upon completion of the project, 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: _Heather Nachtmann_ 04.01.25