



Semi-Annual Progress Report for University Transportation Centers #5

April 1, 2025 – September 30, 2025

Federal Agency: U.S. Department of Transportation, Office of the Assistant Secretary for Research and Technology

Federal Grant #: 69A3552348331

Project Title: Maritime Transportation Research and Education Center (MarTREC)

Center Director: Heather Nachtmann, Ph.D., Professor, Department of Industrial Engineering, University of Arkansas, hln@uark.edu, (479)575-3484

Center Manager: Sandy Sehon, B.S., University of Arkansas, sehon@uark.edu (479)575-7936

Submission Date: October 30, 2025

DUNS: 1914297450000

EIN: 71-6003252

Recipient Organization: University of Arkansas
800 W. Dickson St.
Fayetteville, AR 72701

Project/Grant Period: Start Date: June 1, 2023
End Date: May 31, 2029

Reporting Period End Date: September 30, 2025

Report Term or Frequency: Semi-annual

Signature:

INTRODUCTION

The Maritime Transportation Research and Education Center (MarTREC) is a U.S. Department of Transportation (USDOT) Tier 1 University Transportation Center funded through the Office of the Assistant Secretary for Research and Technology. MarTREC was competitively awarded under MAP-21, the FAST Act, and now through funding of the Bipartisan Infrastructure Law. MarTREC's vision is to be recognized as the nation's premier source for expertise on maritime and multimodal transportation research and education.

The MarTREC consortium consists of renowned maritime transportation researchers dedicated to transferable research and innovative education and workforce development. Our consortium consists of the University of Arkansas, Jackson State University, Louisiana State University, Texas A&M University/Texas Transportation Institute, University of New Orleans, and Vanderbilt University.

This semi-annual progress report is submitted as per our UTC grant reporting requirements.

1. ACCOMPLISHMENTS

What are the major goals of the program?

MarTREC will contribute primarily to the strategic goals of building Economic Strength and Global Competitiveness by addressing resilient supply chains and system reliability and connectivity. The following performance metrics are used to evaluate the effectiveness of our research, leadership, education and workforce development, and technology transfer and collaboration and assess our progress towards meeting our semi-annual goals.

Research Performance Metric	Semi-Annual Goal	Semi-Annual Progress
# of peer-reviewed journal articles (published, accepted, submitted)	10 / 6 month	11
# of conference presentations given	10 / 6 month	15
# of students participating in transportation research projects funded by UTC	10 / 6 month	32
Leadership Performance Metric	Semi-Annual Goal	Semi-Annual Progress
# of national and regional leadership positions held	5 / 6 month	41
# of invited talks given	5 / 6 month	5
# of leadership and research awards received	1-2 / 6 month	5
Education and Workforce Development Performance Metric	Semi-Annual Goal	Semi-Annual Progress
# of transportation-related degrees conferred to supported students	7 / 6 month	2
# of technician certification programs offered	4 / 6 month	7
# K-12 outreach programs offered	2-3 / 6 month	3
Technology Transfer and Collaboration Performance Metric	Semi-Annual Goal	Semi-Annual Progress
# of existing collaborative partnerships	10 / 6 month	51
# of new collaborative partnerships formed	2-3 / 6 month	20
# of project deliverables submitted	2-3 / 6 month	4
# of collaborative research/tech transfer agreements	1-2 / 6 month	0

What was accomplished under these goals?

- MarTREC's progress towards our semi-annual goals is presented in previous table.
- In June 2025, Center Director Heather Nachtmann and a team of researchers from University of Arkansas and Virginia Tech (lead) were awarded a \$1,500,000 grant from the U.S. Army Corps of Engineers to research *Soft Target Protection Against Unmanned Aerial System Threats*. The three-year project includes two current MarTREC researchers and builds on prior MarTREC modeling research.
- In July 2025, Center Director Heather Nachtmann along with other MarTREC researchers was awarded a \$7,000,000 research grant from the National Science Foundation. The four-year program, *ERISE-RII Arkansas Smart Transportation Research Incubator through Data Engineering and Science (AR-STRIDES)*, builds on prior MarTREC research to develop data-driven supply chain technologies and data analytics solutions for next generation transportation and logistics.
- In September 2025, Center Director Heather Nachtmann and researchers Robert Curry and Haitao Liao gave an invited briefing on MarTREC to Congressman Steven Womack and USDOT MARAD Acting Administrator Sang Yi.
- Four new research projects were started during this reporting cycle as presented below.

New Project Title	Lead Institution
Automatic Boundary Detection and Change Analysis Using Static and Dynamic Imagery - 7017	University of Arkansas
Community Resilience in Emergency Advanced Transport Education -The Next Frontier - 7021	Jackson State University
Improved Road Flood Predictability and Disruption Response Through the Synergistic Integration of Geospatial Databases, Process-Based Modeling, and Machine Learning - 7022	Jackson State University
Sustainable and Resilient Multimodal Transport Systems via Container-on-Barge - 7018	University of Arkansas

- Fourteen ongoing research projects continued during this reporting cycle as presented below.

Ongoing Project Title	Lead Institution
Vulnerability Assessment of Bridges Crossing Major US Rivers in Support of a Safe and Resilient Transportation System - 7023	Texas A&M Transportation Institute
Financing for Marine Transport: Analyzing the Impact of Resilient Infrastructure Investments for the Inland Waterways (Part II) – 7003	Vanderbilt University
Deploying Smart Watch Technology to Measure and Mitigate Heat Stress Among Maritime Transportation Workers - 7008	Vanderbilt University
Bracing for Impact: Developing Steel-Concrete Sandwich Panel Retrofits for Increased Bridge Pier Protection - 7013	University of Arkansas
Synthesis and Analysis of Maritime Supply Chain and Freight Indicators - 7015	University of Arkansas
Developing Optimization Methods for Maritime Escort Strategies for Littoral and Chokepoint Shipping Lanes - 7016	University of Arkansas
A Simulation and Decision-Support Tool for Vulnerability Reduction in Hazardous Material Transportation via the U.S. Inland Waterway Transportation System - 7012	University of Arkansas
An Elementary School STEMusical: Exciting the Future of STEM - 7014	University of Arkansas
Continuous Decision Plan for Optimizing Budget Allocation for Dredging Projects Considering Shoaling Effect within a Multi-year Horizon - 7007	Texas A&M University

An Automated Training Model for Selecting Maritime Traffic Monitoring and Tracking Model Types using AIS Data with Missing Information - 7009	Jackson State University
IoT Sensor Fusion for Low-Cost Cloud Based Monitoring for Resilient Levees and Embankments - 7020	Jackson State University
Mississippi Summer Transportation Institute 2025 - 7023	Jackson State University
Pathways for a Future-Ready Maritime Transportation Workforce - 7010	Jackson State University
AI-Driven Preventive Maintenance for Coastal Bridges in Marine Environments - 7011	Jackson State University

- Five research projects were completed during this reporting cycle as presented below.

Completed Project Title	Lead Institution
Evaluation of Employment Options in the Inland Waterways Sector - 7001	Texas A&M Transportation Institute
Modeling Drivers' En-route Diversion Behavior During Congestion: A Pilot Study - 7004	Louisiana State University
Strategies for Potential Emissions Reductions for Commercial Maritime Vessels at Ports - 7002	Texas A&M Transportation Institute
Economic Impact Analysis of Artificial Draft Restriction on the Lower Mississippi River Port Complex – 7005	University of New Orleans
Analyzing the Economic Development Impacts of Truck Parking in Louisiana – 7006	University of New Orleans

The MarTREC consortium leadership team is as follows:

Center Personnel	Title	Organization
Heather Nachtmann	Center Director	University of Arkansas
Michelle Barry	Center Associate Director	University of Arkansas
Stacy Williams	Center Associate Director	University of Arkansas
Sandy Sehon	Center Manager	University of Arkansas
Peggy Anderson	Research Advancement Specialist	University of Arkansas
Hiba Baroud	Site Director	Vanderbilt University
Jim Kruse	Site Director	Texas A&M Transportation Institute
Bethany Stich	Site Director	University of New Orleans
Bruce Wang	Site Director	Texas A&M University
Robert Whalin	Site Director	Jackson State University
Brian Wolshon	Site Director	Louisiana State University

How have the results been disseminated (submitted, accepted, published)?

- Eleven journal articles
- Fifteen presentations
- Twelve conference papers
- Three books/book chapters

What do you plan to do during the next reporting period to accomplish the goals?

- Continue work on ongoing research projects and begin new research projects
- Continue work on disseminating research outcomes

- Work on contributions to TRB Annual Meeting in January 2026
- Collaborate with other focused UTCs to host a UTC Symposium on mobility research in 2026
- Begin preparation to host our annual Professional Advisory Board meeting at the University of Arkansas in fall 2026
- Continue building collaborations to ensure MarTREC contributes use-inspired research serving USDOT and its associated constituents

2. PARTICIPANTS & COLLABORATING ORGANIZATIONS

What organizations have been involved as partners?

Advisory Board Member	Title	Organization
Harold Beaver	District Engineer, (Retired)	Arkansas Department of Transportation
Reese Brewer	Director	Frontier Metropolitan Planning Organization
Jack Buffington	Director, (Retired)	Mack Blackwell Transportation Center
Cassandra Caldwell	Executive Director	Arkansas Waterways Commission
Bryan Day	Executive Director	Port of Little Rock
Dan Flowers	Director, (Retired)	Arkansas Department of Transportation
Ann Gilbert	Executive Director	Arkansas Transit Association
Gary Hunt	Vice President, (Retired)	ABF Freight System, Inc.
Mike Johnson	Assoc. Vice Chancellor, Facilities (Retired)	University of Arkansas
Caren Kraska	President/Chairman	Arkansas & Missouri Railroad
Glenn Moore	Advisor, Cyber Security and Infrastructure Security Agency	U.S. Dept. of Homeland Security
Ned Mitchell	Research Civil Engineer	U.S. Army Corps of Engineers
Shannon Newton	President	Arkansas Trucking Association
Craig Philip	Professor, Civil Engineering	Vanderbilt University
Matthew Smith	Technical Director, Water Resources Infrastructure	U.S. Army Corps of Engineers
Melissa Tooley	Director, External Initiatives	Texas A&M Transportation Institute
Eric Wolfe	President	Watco Logistics

Have other collaborators or contacts been involved?

Existing Collaborators

1. Aaron Brantly, Virginia Tech, Blacksburg, VA, research collaboration
2. Brenda Dix, ICF Inc., research
3. Cathy Vienne, Propeller Club of New Orleans
4. Charles Colen, University of Arkansas at Pine Bluff, Pine Bluff, AR, research collaboration
5. Charles Doktycz, Argonne National Laboratory, research
6. Cheryl Keymer, North Arkansas College, Harrison, AR, research collaboration
7. Christine Titus, Greater New Orleans Port Safety Council, outreach
8. Colmore Christian, Alabama A&M
9. Connie Porter Betts, Louisiana Department of Transportation, board service
10. Craig Woolsey, Virginia Tech, Blacksburg, VA, research collaboration

11. Daniel Capparella, Greater Nashville Regional Council, outreach
12. David Scoggin, Global Logistics Expert, board service
13. Dawn Lopez, Turn Services, outreach
14. Donghoon Kim, Arkansas State University, Jonesboro, AR, research collaboration
15. Douglas Grubbs, Crescent Port Pilots Association (retired), board service and outreach
16. Doug Hutchings, Arkansas Research Alliance, research collaboration
17. Doug Mettenburg, J.B. Hunt Industry
18. Dwight Norton, Chief of Planning and Infrastructure, New Orleans Regional Transit Authority, board service
19. Greg Harris, New Orleans Public Belt Railroad, board service and outreach
20. Harrison Crabtree, Director, World Trade Center Greater New Orleans, board service
21. Jack Mays, Virginia Tech, Blacksburg, VA, research collaboration
22. James Davis, US Army Corps of Engineers, Vicksburg, MS, research collaboration
23. Jeff Roesel, New Orleans Regional Planning Commission, board service and adjunct instructor
24. Joannis Koutromanos, Virginia Tech, Blacksburg, VA, research collaboration
25. Kristi App, International Freight Forwarders & Customs Brokers Association of New Orleans, research
26. Kylee Mills, Port of New Orleans, outreach
27. Laura Berry, North Arkansas College, Harrison, AR, research collaboration
28. Laura Bryan, Principal Planner, City of New Orleans, board service
29. Laura Myers, University of Alabama
30. LCDR Chase Allvord, U.S. Navy, research collaboration
31. LCDR Dan Wright, U.S. Navy, research collaboration
32. Louisiana Disaster Resilience Initiative, board service
33. Louisiana Ports and Waterways Investment Commission, board service
34. Magdalena Asborno, USACE
35. Matt Gondolf, USC Berkely
36. Michael Roth, US Army Corps of Engineers, Vicksburg, MS, research collaboration
37. MS Emergency Management Agency (MEMA)
38. MS Department of Transportation
39. National Waterways Foundation
40. Ned Kenneth, USACE
41. Paul Matthews, Port of South LA, research, outreach, board service
42. Randy Guillot, President, Triple G. Express, Inc., research and board service
43. Rebecca Efroymsen, Oak Ridge Nations Laboratory
44. Reese Brewer, Frontier Metropolitan Planning Organization, advisory board member
45. Renee Amar, Executive Director, Louisiana Motor Transport Association, board service
46. Sanjib Sharma, Howard University
47. Saurav Kumar, Arizona State University
48. Scott Parr, Embry-Riddle Aeronautical University, research
49. Steve Olmsted, Arizona Department of Transportation, research
50. University of Louisiana, Maritime Academy Advisory Committee, board service
51. William App, President, J. W. Allen & Co., Inc., board service

New Collaborations

1. Bertiel Harris, FEMA
2. Bo Zeng, University of Pittsburgh
3. Eric Wolfe, Watco Logistics

4. Fan Bu, Texas Tech University
5. Greg Dejarnett, Alabama Emergency management
6. J.B. Ruhl, Vanderbilt University
7. Jesse Spencer-Smith, Vanderbilt University
8. John Walker, Caltrans
9. Jurgen Hackl, Princeton
10. Karin El-Basyouny, University of Alberta; Edmonton, Canada
11. Kelly Owens, INROADS
12. Kimberly Hilllard, Center for Social Entrepreneurship
13. LCDR Casey Rayburg, U.S. Navy, research collaboration
14. LCDR Ian Johnston, U.S. Navy (retired), research collaboration
15. Mike Sewell, Gresham Smith
16. Northwestern University Transportation Center
17. Rebecca Bian, University of Maine
18. Sarah Smith, Arkansas Research Alliance
19. Stephen Wong, University of Alberta; Edmonton, Canada
20. Yili Tang, University of Western Ontario, Canada

3. OUTPUTS

Journal publications, presentations, conference papers, and books

Journal Publications

1. Bista, S., Bhattarai, S., Sharma, S. & Talchabhadel, R. Local-scale flood hazard projections in historically vulnerable communities. *Model. Earth Syst. Environ.* 12, 5 (2026).
2. Bu, Fan, and Heather Nachtmann, "Forecasting Inland Waterway Container on Barge Volume: A Machine Learning Approach Using Economic Feature," *Applied Artificial Intelligence*, published August 2025.
3. Gupta, V.K, Burris, M., Wang, X., and Turnbull, K.F., 2025. The Impact of the I-35 HOT Lane Toll Cap on Congestion and Revenue. In press. *Research in Transportation Economics*. Elsevier Publisher.
4. Kang, L., Z. Zhang, B. Wolshon, S. Zhang, B. Yu, "Spatial and Socio-Cultural Dimensions of Air Transportation in China: Post-Pandemic Travel Trends and Relationships," Submitted July 2025. In press for publication in the *ASCE Journal of Transportation Engineering*, Part
5. Kondolf, G. M., Herbert, B., Dodd, A., & Serra-Llobet, A. (2025). Flood Control in Jackson, Mississippi: A Missed Opportunity to Reduce Inequitable Flooding Impacts *Water*, 17(4), 497.
6. Mllum, F. B., & Stich, B. (2025). Analyzing the impact of international trade policies, global pandemic, and geopolitical conflicts on the Lower Mississippi River port systems. *Case Studies on Transportation Policies* (under review)
7. Meng, Y., X. Wang, H. Tan, H. Liu, and W. Xu. 2025. Bayesian Procedures for Modeling Truck Route Choices. *IEEE Transactions on Intelligent Transportation Systems*. 26(8), 11647-11657.
8. Stich, B. and Mllum, F. B. Examining U.S. transportation and trade policy dynamics through the Advocacy Coalition Framework: A case study. *Journal of Transport Economics and Policy*. (under review)
9. Sultana, T., H. Hassan, and B. Wolshon, "Toward the Integration of Vehicle-to-Infrastructure (V2I) Communication in Transportation System: An Investigation of Drivers' Perceptions and Preferences for V2I Messages," *Journal of Intelligent Transportation Systems*, 2025. In Print.

10. Whalin, Robert W, Kwembe, Tor A, Jackson, Eric S, Nelson, Lancelot, and Tchakoua, Ingrid K (2024). Novel Big Data and Artificial Intelligence Analytics Methods for Tracking and Monitoring Maritime Traffics.
11. Wolshon, B., S.A. Parr, S.S. Parida, and S. Wong, "Roadway Traffic Assessment of the 2023 Maui Wildfire," Natural Hazards Review, 2025. In Print

Presentations

1. Amee, Marjea, and Nachtmann, Heather, "A Multi-Regional Economic Impact Analysis of Mississippi River Inland Waterway Transportation in Arkansas," IISE Annual Conference, June 2025.
2. Amee, Marjea, and Heather Nachtmann, "Evaluating the Economic Impact of Inland Waterways: A Comprehensive Review," IISE Annual Conference, June 2025.
3. Curry, Robert, Mitra, S., Sullivan, K. "Contested Logistics Models and Algorithms across the Department of Defense," Military Operations Research Symposium 2025, June 2025
4. Curry, R., Mitra, S. Sullivan, K., "Developing Optimization Methods for Maritime Escort Strategies for Littoral and Chokepoint Shipping Lanes," September 2025
5. Hebert, B, Chowdhury, M and Polk, D. Fragile, Invisible and at a Crossroads: Navigating Maritime Labor Dynamics, Workforce Development and Advancing Economic Mobility in the Maritime Industry to submitted to the 2026 National American Planning Conference
6. Khan, S., Khan, M. F., and Zohuruzzaman, A.Q.M. (2024). Climate Adaptive Slope Stabilization using Vetiver Grass. In AREMA 2024.
7. Lawson, Amelia., "Investigating Traffic Safety during Hurricane Evacuations: Analyzing Crash Rates and Contributing Factors in Florida," Association of Transportation Safety Information Professionals (ATSIP) at the 50th Traffic Records Forum (TRF), accepted July 2025
8. Nachtmann, Heather, Robert Curry, Haitao Liao, "MarTREC Overview," Invited presentation to Congressman Steven Womack and USDOT MARAD Acting Administrator Sang Yi, September 2025.
9. Philip, Craig, Moderator, SmartRivers Plenary Panel on Maritime Disruption, September 2025
10. Rahman, Zaidur, and Nachtmann, Heather, "From Roads to Rivers: Adapting Reinforcement Learning Solutions for Barge Transportation," IISE Annual Conference, June 2025.
11. Rahman, Zaidur, and Nachtmann, Heather "Smart Waterways: A Retrieval-Augmented AI Framework for Vessel Tracking and Decision Support," Smart Rivers 2025, September 2025.
12. Shifat, SE., Zohuruzzaman, A. Q. M., Darothy S.B., Li, Y., Khan, S., Cour, I.L., Shafi, N. (2025).
13. Wolshon, Brian, "Transportation Resilience and Safety," Beihang University, September 2025
14. Wolshon, Brian, "Route Diversion as Resilience Strategy: Driver Preference and Behavior," 2025 International Industry-Academia-Research Application Cooperation Conference, Hangzhou, People's Republic of China, July 2025
15. Zhang C.P, Quadrifoglio L. and Wang B., "Enhancing Container Terminal Efficiency through Scheduling Algorithms of AGV Dispatching for Tandem Quay Crane Operations", I-NUF, Los Angeles, CA, Apr 2025

Conference Papers

1. Amee, M., and Nachtmann, H., "Evaluating the Economic Impact of Inland Waterways: A Comprehensive Review," IISE Annual Conference Proceedings, June 2025. Status: Published.
2. Bhandari, A., Bhattarai, Y., Sharma, S. & Talchabhadel, R. Enhancing Transportation Resilience to Floods Using Machine Learning based Surrogate Model [Accepted]. in TRBAM-26 (Washington, D.C., 2026), Accepted for January 2026.

3. Fuller, J.D., Bian, R., Murray-Tuite, p., Wolshon, B., Characterizing Driver Route Flexibility – An International Analysis, Transportation Research Record: Journal of the Transportation Research Board, Presentation: Accepted, Publication: Rejected, undergoing revisions
4. Fuller, J.D., Behrens, R., Kowald, M., Workshop Synthesis: Surveys and Data to Support Transport Planning Processes, International Steering Committee for Transport Survey Conferences, 2025, Status: Published.
5. Lawson, A., Wolshon, B., Parr, S., El-Basyouny, K., Wong, S., Blain, M., Traffic Safety Assessment of Crashes for Hurricane Evacuations, Transportation Research Record: Journal of the Transportation Research Board, 2026, Status: Presentation: Accepted, Publication: Under Review
6. Lawson, A., Parr, S., Wolshon, B., Willoughby, S., Li, B., California and Arizona Wildfire Evacuation Safety Analysis, Transportation Research Record: Journal of the Transportation Research Board, 2026, Status: Under Review
7. Lawson, A., Parr, S., Wolshon, B., Wong, S., Crash Rate Analysis for Hurricane Evacuations, Transportation Research Record: Journal of the Transportation Research Board, Status: Undergoing revisions
8. Murphy, J., Tech Sim for Disasters; 1909 Technology Education Conference Accepted for 11/21/2025
9. Venugopal, M., “Strategies for Potential Emissions Reductions for Commercial Maritime Vessels at Ports,” Transportation Review Board, Accepted for January 2026
10. Wolshon, B., Zhang, Z., Liao, C., Cole, G., Fuller, J.D., Schmidt, J., Route Diversion Behavior in Urban China: Effects of Travel Time, Delay, and Navigation Preference, Transportation Research Record: Journal of the Transportation Research Board, Status: Undergoing revisions
11. Zhang, Z., Kang, L., Parr, S., Wolshon, B., Investigating Traffic Resilience and Clearance Time in Hurricane Evacuations: The Role of Population, Geographic Factors, and Evacuation Corridors, Transportation Research Record
12. Zhang, S., Zhang, Z., and Wolshon, B., Signalized Intersection Utilization and Resilience, Submitted August 2025. In press for publication

Books/Book Chapters

1. Mallum, F. B., Hayward, P., & Fleury, C. (2025). Book Chapter Publisher: From bayou heritage to blue-green corridors: The development of contemporary urban functions of New Orleans’ Bayou St. John and Lafitte Greenway. In [Philip Hayward] (1st Ed.), [Blue- Green Rehabilitation. Urban Leisure and Tourism in River Cities. (pp.22x–41). CAB International, United Kingdom.
2. Wolshon, B. and V.V Dixit, “Planning and Management of Transportation Systems for Evacuation,” Handbook of Emergency Response: A Human Factors and Systems Engineering Approach,” Second Edition, Taylor & Francis Publishing Inc., New York, in press 2025.
3. Wolshon, B. and S. Parr, Emergency and Major Event Transportation Systems Planning, Design, Management, and Operations, Elsevier Press, Book, in development for March 2026 publication.

Website(s) or other Internet site(s)

<https://martrec.uark.edu/>
<https://www.uno.edu/academics/colaehd/la/centers-institutes-affiliates/transportation>
<https://tti.tamu.edu/>
<https://www.vanderbilt.edu/vector/>

Technologies or techniques

- Collaborations with Industry on transportation research and development

- Disseminated work at conferences and various meetings with military officers
- All code and data generated from research made publicly available
- Research outcomes, methods, and data collection methods among various state DOT's share with State DOT employees via presentations at: Association of Transportation Safety Information Professionals (ATSIP), 50th Traffic Records Forum (TRF)
Expanding knowledge involving the use of smartwatch and computer vision technology to solve practical transport safety and mobility problems
- Use of computer vision for traffic safety analysis and use of smartwatches to identify stressful locations (Vandy)
- Collaboration in the development and submission of a new proposal to the Marine Transportation Research Center, focused on physically informed machine learning methods that embed physical laws into deterioration prediction.
- Established the explainable, physics-informed machine learning architecture using the Temporal Fusion Transformer (TFT) Model
- Developed a weather notification App with resource information before, during, and after an emergency

Inventions, patent applications, and/or licenses

- Nothing to report

Other products

- Nothing to report

4. OUTCOMES

MarTREC faculty have increased the body of knowledge through courses they teach at their universities:

Undergraduate Courses

1. Active Transportation Planning, Policy and Design
2. Car Culture & Suburbs
3. Case Studies in Risk and Reliability
4. Civil Engineering Systems
5. Data Analytics for Engineers
6. Decision Support Tools in Supply Chain and Logistics
7. Engineering Economic Analysis
8. Enterprise Risk Management
9. Geometric Design of Highways and Airports
10. Globalization & Mobility
11. Introduction to Incident Command Systems
12. Introduction to Transportation Engineering
13. Introduction to Operations Research
14. Network Optimization Methods in Data Science
15. Principles of Highway and Traffic Engineering
16. Risk, Reliability, Resilience Engineering
17. Senior Design Project

Graduate Courses

1. Active Transportation Planning, Policy and Design

2. Applied Techniques for Transportation Professionals
3. Case Studies in Risk and Reliability
4. Direct Study, Transportation Management
5. Engineering Hydrology
6. Enterprise Risk Management
7. Environment & Energy
8. Intermodal Freight Transportation
9. Introduction to Transportation Planning
10. Introduction to Optimization Theory
11. Network Optimization
12. Traffic Operations and Control
13. Transportation Policy and Administration

Short Courses

1. Webinar #1: "Bridging the Generational Divide: Recruitment, Retention, and the Aging Workforce"
2. Webinar #2: "Greening the Fleet: Sustainability and the New Maritime Worker" Shift to autonomous shipping and impact on demand for workers with new skill sets related to technology and data analysis.
3. "Waves of Disruption: From Supply Chain Shocks to Autonomous and AI Futures" Date: September 10th, 2025
4. Community Resilience Training- Weather Response and Transportation, July 2025
5. Planning workshop in collaboration with University of Alabama

5. IMPACTS

What is the impact on the effectiveness of the transportation system?

MarTREC faculty have impacted on the transportation system by holding **leadership positions** that engage with external transportation organizations and individuals:

1. Advisor, Alpha Pi Mu
2. Advisory Board Member on Transportation Research Part E: Logistics Review
3. Associate Editor, IEEE Transactions on Reliability
4. Board of Directors, American Concrete Institute (ACI)
5. Board Member and Past Chairman, Cumberland River Compact
6. Board Member, NASEM Governing
7. Board Member, National Waterways Foundation
8. Board Member, Southeastern Conference of Public Administration
9. Chair, TRB Standing Committee on Extreme Weather and Climate Adaptation
10. Chairman, Marine Board
11. Co-Chair, Committee, U.S. Gulf Coast, National Academies of Science, Engineering & Medicine (NASEM) Gulf Research Program
12. Co-chair, Risk and Resilience Measurement Committee Member in ASCE Infrastructure Resilience Division
13. Committee Chair, Transportation Research Board, Executive Committee and NRC Division
14. Committee Member, Green Shipping Corridor Stakeholders
15. Committee Member, IISE Scholarship
16. Committee Member, INFORMS Scholarship

17. Committee Member, Inland Waterway Transportation
18. Committee Member, NASEM Report Review
19. Committee Member, SmartRivers 2025 Conference
20. Committee Member, Transportation Research Board: Critical Infrastructure Protection
21. Committee Member, TRB Resilience Section
22. Committee Planning Member, 2026 NaTMEC conference
23. Editorial Board, Journal of Critical Infrastructure
24. Executive Committee Member, ASA Transportation Statistics Interest Group
25. Executive Committee Member, Global Young Academy
26. Lead Track Chair, IISE Annual Meeting Operations Research
27. Member, Advisory Council for Transportation Research, Arkansas Department of Transportation
28. Member, American Society for Public Administration Transportation Policy & Administration
29. Member, ERVA Standing Council, NSF Engineering Research Visioning Alliance
30. Member, Farish Street Revitalization Strategy Committee
31. Member, Federal Demonstration Partnership/NAS, Truitt-Felbinger Award Committee American Society for Public Administration
32. Member, IISE Transactions on Healthcare Systems Engineering
33. Member, Jackson Public School's Facility Repurposing & Advising Committee
34. Member, Board of Construction, City of Jackson
35. Member, Louisiana Ports and Waterways Investment Commission
36. Member, WTCNO International Trade Council
37. Member, Strategic Planning Committee ACSP
38. Member, Transportation Research Committee on Ports and Channels
39. Member-At-Large, Council of University Transportation Centers Executive Committee
40. Past Director Region 2, Epsilon Pi Tau International Tech Honorary (2014-2023)
41. Senior INFORMS Member
42. Trustee, Honorary, Epsilon Pi Tau International Tech Tech, Jackson State Chapter
43. US representative, World Association for Waterborne Transport Infrastructure (PIANC) Task 193

Awards bestowed upon MarTREC **faculty** as a result of their contributions to the understanding and awareness of transportation issues:

1. Rob Curry, Ph.D., MORS Wayne Hughes Award
2. Jessica Murphy, International Technology and Engineering Educator- Distinguished Technology Educator Award
3. Jessica Murphy, Epsilon Pi Tau International Technology Honorary- Professional Practice Award
4. Justin Chimka, Ph.D., John L. Imhoff Chair
5. Morgan Broberg, Ph.D., AISC Advancing Structural Steel Education Award

Awards bestowed upon MarTREC **students** as a result of their contributions to the understanding and awareness of transportation issues:

1. Fan Bu, American Society for Engineering Management, Best Dissertation Award, September 2025
2. Scholarship recipients to students for articles on maritime labor workforce development

What is the impact on the body of scientific knowledge?

Editorial journal positions currently held by MarTREC researchers:

1. Associate Editor, INFORMS Journal on Computing
2. Associate Editor, Maritime Economics and Logistics

3. Associate Editor, Natural Hazards Review
4. Associate Editor, Stochastics and Quality Control
5. Co-Guest Editor, Special Issue "Geography on Human Mobility Resilience," Journal of Transport Geography
6. Editorial Board, Quality Engineering
7. Editorial Board, ACI Structural Journal
8. Editorial Board, Engineering Structures
9. Editorial Member, ASCE Journal of Risk and Uncertainty
10. Editorial Member, Environment Systems and Decisions
11. Editorial Member, Journal of Infrastructure Policy
12. Area Editor, The Engineering Economist
13. Guest Editor, Special issue "Bayesian Methods in Big Reliability Data Analysis", Reliability Engineering & System Safety
14. Guest Editor, Special Issue "Multimodal Transport Resilience Modeling and Policy," Journal of Transport Geography
15. Guest Co-Editor, Special Issue "Recent Advances of Artificial Intelligence Innovations in Health Systems Engineering," IISE Transactions on Healthcare Systems Engineering
16. Review Editor, Frontiers in Water, Water and Built Environment
17. Reviewer, American Society of Engineering Education, Technology Interface International Journal

What is the impact on transportation workforce development?

- MarTREC graduated five students into the transportation workforce, one master's student and four doctoral students.
- The Center for Training Transportation Professionals at the University of Arkansas executed workforce development training programs through 27 classes, certifying 491 participants in seven areas: asphalt, aggregates, concrete, pavement, soils, stormwater management, and unpaved roads.
- Projects are training undergraduate students, graduate students, and research scientists to become independent researchers and future decision makers
- The future of workforce development will likely continue to focus on innovation, collaboration across sectors, and adapting to the challenges posed by technology, demographic shifts, and economic globalization
- Promote the multidisciplinary approach to emergency management

6. CHANGES/PROBLEMS

Changes in approach and reasons for change

- In June 2025, the General Provisions and IJIA Grant Deliverables and Reporting Requirements were updated. These changes impact MarTREC's operations in multiple ways. New UTC meeting requirements will impact travel and event expenses and time spent in preparation for these meetings. The new requirement of OST-R approvals on MarTREC's new research projects and other new activities (symposia, conferences, workshops, webinars, training, technical assistance, etc.) before the costs of those projects/activities begin to incur and any announcements of webinars or seminars intended for a public domain have resulted in modifications of MarTREC's project review and communication processes. New UTC guidance documents were shared with the MarTREC consortium.

- Currently, USDOT does not have an approved strategic plan, as the previous one that UTCs used in the 2023 competition has been withdrawn. MarTREC continues to focus on its strategic goals of Economic Strength and Global Competitiveness. Our team invested significant time ensuring that all ongoing projects, programs, website, and marketing materials fall within the guidance of the current federal administration. All guidance received from OST-R was shared with the MarTREC consortium.

Actual or anticipated problems or delays and actions or plans to resolve them

- Amy Shell, who served as the center manager for the past eleven years, left the center for a hard-funded position on campus. An internal search for a new center manager was successfully conducted, and the position was filled by Sandy Sehon whose has significant experience on the financial side of grant management. The transition slowed work for a couple of months, but no major delays in meeting grant requirements were incurred.
- Receipt of Year 3 funds was delayed from June 2025 to August 2025. MarTREC proceeded with its internal project request process and submitted new research projects for OST-R review once our Year 3 funds were received.
- MarTREC reviewed all under review, ongoing, and completed projects and activities to ensure adherence with the guidance of the current federal administration. One under-review project request was found to not align with current guidance and was subsequently not funded. A few ongoing projects were found to be partially misaligned with current federal research priorities. Each of these projects were revised by project PIs and reviewed by the Center Director. Project records were updated accordingly. One completed project was found to not align with current federal research priorities, and its report was archived as per guidance from OST-R.
- Anticipated Annual Progress Meeting was not held and excused as a grant requirement as per OST-R.
- MarTREC was selected to host the June 2025 Council of University Transportation Centers (CUTC) Summer Meeting in Northwest Arkansas. The center team spent significantly planning for this event in April and May 2025 and throughout the previous year. In May 2025, CUTC was informed that the UTC Program staff and OST-R leadership would not be holding the June 25 UTC Directors meeting that was to be held in conjunction with the 2025 CUTC Summer Meeting. It was anticipated that this, coupled with the recent UTC terminations and delayed 2025-2026 UTC funding, would result in extremely low meeting attendance. Therefore, the CUTC Executive Committee made the decision to cancel the 2025 CUTC Summer Meeting. No planned or actual event costs were incurred on the UTC grant.

Changes that have a significant impact on expenditures

- Receipt of Year 3 funds was delayed from June 2025 to August 2025. An additional step in starting new research projects has been added by the new requirement for OST-R to approve new research projects prior to their start. These changes have led to a delayed start for a limited number of new projects. This may slow research expenditures for the current and next reporting period. It is unknown if this will have a significant impact. If so, it is anticipated to only occur in the short term.

Significant changes in use or care of animals, human subjects, and/or biohazards

- Nothing to Report

7. SPECIAL REPORTING REQUIREMENTS

- Nothing to Report