



**USDOT Tier 1 University Transportation Center  
Program Progress Performance Report #2**

Agency: USDOT Research and Innovative Technology Administration

Federal Grant #: DTRT13-G-UTC50

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

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Recipient Organization: University of Arkansas

Project/Grant Period: Start Date September 30, 2013  
End Date: September 30, 2017

PPPR#2 Reporting Period Start Date: April 01, 2014  
PPPR#2 Reporting Period End Date: September 30, 2014

Report Term or Frequency: six months

Signature:

## Maritime Transportation Research & Education Center (MarTREC)

MarTREC is a USDOT Tier 1 University Transportation Center funded in September 30, 2013 under MAP-21. Our consortium consists of the University of Arkansas (UARK), Fayetteville, AR; Jackson State University (JSU), Jackson, MS; Louisiana State University (LSU), Baton Rouge, LA; and University of New Orleans (UNO), New Orleans, LA. Each institution is strategically located to support the MarTREC theme and consists of renowned maritime transportation researchers dedicated to transferrable research and inclusive education and workforce development.

MarTREC's theme is building economic competitiveness through efficient, resilient, and sustainable maritime and multimodal transportation systems. Our vision is to be recognized as the Nation's premier source for expertise on maritime and multimodal transportation research and education.

### 1. Accomplishments of Goals and Objectives

#### 1.1 Research

Goal: MarTREC will conduct research that contributes to building economic competitiveness through efficient, resilient, and sustainable maritime and multimodal transportation systems.

Objectives:

- 1) Conduct research projects related to MarTREC's research goal
- 2) Engage a diverse set of faculty and students in MarTREC research activities
- 3) Disseminate research findings

Accomplishments:

Metric	Achieved PPPR#2	Objective Addressed
# of ongoing projects in each MarTREC research area	15	1
# of peer-reviewed journal articles (published, accepted, submitted)	11	3
# of conference presentations	12	3
# of tenure track faculty who conduct MarTREC research activities	13	2
# of external partners involved in center research activities	16	3
# of research activities that impact diversity through participants and/or outcomes	28	2
# of UG/G students participating in transportation research projects funded by UTC	29	2
# of MS/PhD transportation-related advanced degree programs	8	2
# of MS/PhD graduate students supported by MarTREC	18	2
# of MS/PhD students supported by MarTREC who received degrees	1	3

## 1.2 Leadership

Goal: MarTREC will become the premier source for expertise on maritime transportation research, education, and workforce development.

Objectives:

- 1) Demonstrate academic leadership towards MarTREC's leadership goal
- 2) Demonstrate industry leadership towards MarTREC's leadership goal

Accomplishments:

Metric	Achieved PPPR#2	Objective Addressed
# of national and regional leadership positions held	19	1
# of conference planning positions held	7	1
# of invited talks given	12	1
# of leadership and research awards received	2	1
# of impactful research citations by stakeholders	3	2
# of UG/G students participating in transportation research projects funded by UTC	29	1
# of junior faculty mentored	2	1
# of leadership workshops held	0	2
# of external grant proposals submitted	12	2

## 1.3 Education and Workforce Development

Goal: MarTREC will develop educational resources to elucidate scientific and engineering practices involved in maritime and multimodal transportation systems and practices.

Objectives:

- 1) Conduct education and workforce development (EWD) projects related to the EWD goal
- 2) Educate college students within MarTREC theme
- 3) Conduct workforce development related to MarTREC theme
- 4) Conduct outreach activities related to MarTREC theme
- 5) Make societal impact related to EWD goal

Accomplishments:

Metric	Achieved PPPR#2	Objective Addressed
# of projects in MarTREC educational and workforce development areas	10	1
# of UG/G transportation-related courses offered	18	2
# of distinguished lectures & seminars offered	0	3

participant count of distinguished lectures & seminars offered	0	3
# of short courses and workshops offered	0	3
participant count of short courses and workshops offered	0	3
# of technician certification programs offered	19	3
participant count of technician certification programs offered	301	3
# of educational modules and case studies developed	3	2
# of student-authored publications	9	2
# of student-presented presentations	5	2
# of K-12 summer programs offered	16	4
participant count of K-12 summer programs offered	754	4
% of female participants in K-12 programs	64%	4
% of minority participants in K-12 programs	42%	4
# of pre-college programs offered	1	4
participant count of pre-college programs offered	25	4
# of online K-12 educational resources posted	3	4

#### 1.4 Technology Transfer

Goal: MarTREC consortium institutions will participate in national, regional, and local education and workforce development outreach to provide state-of-the-art knowledge to private and public transportation organizations and provide a forum where government employees, academic researchers, and private sector can exchange ideas on current issues.

Objectives:

- 1) Transfer MarTREC outcomes into practice
- 2) Develop products in support of MarTREC technology transfer goal

Accomplishments:

Metric	Achieved PPPR#2	Objective Addressed
# of peer-reviewed journal articles (published, accepted, submitted)	11	2
# of conference presentations	12	2
# of technical briefs	4	2
# of guidebooks	1	2
# of short courses and workshops offered	0	1
participant count of short courses and workshops offered	0	1
# of conference planning positions held	7	1
# of editorial journal positions held	18	1
# of technician certification programs offered	19	1

participant count of technician certification programs offered	301	1
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### 1.5 Collaboration

Goal: MarTREC will continue our existing partnerships with maritime and multimodal transportation stakeholders and develop new partnerships at the consortium, institution, and project levels to facilitate our planned research, leadership, education, workforce development, and technology transfer activities.

Objectives:

- 1) Develop external partnerships related to MarTREC’s collaboration goal
- 2) Develop collaborative products related to MarTREC’s collaboration goal
- 3) Engage faculty and students in achieving MarTREC’s collaboration goal

Accomplishments:

Metric	Achieved PPPR#2	Objective Addressed
# of new collaborative partnerships formed	17	1
# of collaborative activities conducted	5	2
# of collaborative deliverables completed	1	2
# of collaborative team events held	2	2
# of collaborative outreach events held	5	2
# of faculty involved in collaborative activities	12	3
# of students involved in collaborative activities	22	3

### 1.6 Plans for Next Reporting Cycle

MarTREC has eleven new research products that we initiated during this six month reporting period. The faculty researchers will be engaging with industry experts to ensure that these and our other four projects are working transformational contributions. We will continue to expand our collaborative partnerships to support this. We will increase our focus on educational and technology transfer activities now that our research projects are up and running. We are holding a meeting of our Advisory Board on November 7, 2014.

## 2. Products

### 2.1 Publications

Journal Articles

1. Nachtmann, Heather, Kenneth N. Mitchell, Chase E. Rainwater, Ridvan Gedik, and Edward A. Pohl, “Optimal Dredge Fleet Scheduling with Environmental Work Windows,” Transportation

Research Record: Journal of the Transportation Research Board, No. 2426 (2014), pp. 11-19. (published)

2. Tong, Jingjing, Heather Nachtmann, and Edward Pohl, "Value-Focused Assessment of Cargo Value Decreasing Rate," submitted to the Engineering Management Journal in September 2014. (submitted)

3. Tong, Jingjing, Heather Nachtmann, "Cargo Prioritization and Terminal Allocation Problem for Inland Waterway Disruptions," submitted to Transportation Research Record in August 2014. (submitted)

4. "Simulation Study of Corridor Traffic Management Deployment Strategies in No-notice Evacuation in Downtown Jackson" by Lei Bu (student), and Feng Wang, under review by the J of Transportation Safety and Security. (under review)

5. "Current Practices of Acquiring Public Road Inventory Data in the United States", by Yuxiao Zhou (student), Yan Qi, James Fairly (student), and Feng Wang, under review of Journal of Advances in Transportation Studies. (under review)

6. Lowe, K., Reckhow, S., & Gainsborough, J., "Capacity and equity: Federal funding competition between and within regions", The Journal of Urban Affairs. (accepted)

7. Cowell, M., Gainsborough, J., & Lowe, K., "Resilience and mimetic behavior: Economic visions in the Great Recession", The Journal of Urban Affairs. (accepted)

8. Lowe, K. (Forthcoming) "Rethinking competition in TIGER: Lessons for federal funding and public administration", Public Works Management & Policy. (accepted)

9. Lowe, K. "Commute behavior of and accessibility for low-income workers in Post-Katrina New Orleans", Transportation Research Record.

10. John Renne and Peter Bennett, "Socioeconomics of Urban Travel Evidence from the 2009 National Household Travel Survey with Implications for Sustainability," World Transport Policy and Practice, Vol. 20, No. 4, pp. 7-27, 2014. (published)

11. Stich, Bethany, "Intermodal Transportation Disruption and Reroute Simulation Framework: Lesson for Freight Planning", Transportation Research Record, 2014. (published)

#### Conference Papers

1. Furkan Oztanriseven (student), Lizzette Pérez-Lespier, Suzanna Long, and Heather Nachtmann, "A Review of System Dynamics in Maritime Transportation," IIE Annual Conference, June 2014. (published)

2. "Development of Gate Control Model for Traffic Management in Localized Emergency Evacuation", by Lei Bu (student), Feng Wang, and Chuanzhong Yin. (accepted)

3. "Evaluation of Mississippi's Pavement Warranty Thresholds Using Pavement Management System Data", by Yan Qi, Feng Wang, Amin El Gendy, and Yibi Li (student). (accepted)

4. "Characterized Vessel Travel Times by Water Levels in Case Studies", by Ivy Riley (student), Kenneth Mitchell, Patricia DiJoseph, Robert Whalin, and Feng Wang. (accepted)

#### Presentations

1. Furkan Oztanriseven (student), "Disruption Cost Analysis of Inland Waterway Transportation," IIE Annual Conference, June 2014. (presented)

2. Furkan Oztanriseven (student), "A Review of System Dynamics in Maritime Transportation," IIE Annual Conference, June 2014. (presented)

3. Heather Nachtmann, "Regional Economic Impact Study of the McClellan-Kerr Arkansas River Navigation System," Mississippi River Commission Inspection Tour, August 2014. (presented)
4. "Characterizing Vessel Travel Times with Waterway Water Levels", presented by Ivy Riley (student) and Feng Wang on September 19, 2014 in The 2014 Southeast Symposium on Contemporary Engineering Topics (SSCET) and the UNO Engineering Forum. (presented)
5. Brian Wolshon, "Stroke, Aphasia, and Driving", presentation made to LSU Graduate Students (presented)
6. Brian Wolshon, "Road sign recognition", presentation made to North Oaks Hospital Stroke Group, Hammond, LA (presented)
7. Brian Wolshon, "Driving for with Aphasia", presentation made at Baton Rouge Rehab hospital stroke support group, Baton Rouge, LA (presented)
8. Adam Tatar & Carrie MacKay (students presenting on behalf of course of 11 graduate students). "Freight down the Middle: Neighborhood Impacts and Options," May 7, 2014 (presented)
9. James Amdal, "Container on Barge", Mississippi River Towns & Cities Initiative, Sept. 16-18, 2014, (Invited). (presented)
10. John Renne, "Beating the Great Recession". A National Inventory of Home Values in TODs from 1996 - 2013. International Transportation and Economic Development Conference, Dallas, Texas, April 10, 2014. (presented)
11. John Renne, "The Intersection between Transportation, Health and Quality of Life" Rotary Club, New Orleans, Louisiana, May 7, 2014. (presented)
12. John Renne and Students, "Multimodal and Transit-Oriented Development Potential in District C", Final Class Public Presentation, New Orleans Healing Center, May 5, 2014. (presented)

Books/Other One Time Publications

1. Tong, Jingjing, "Disruption Response Support For Inland Waterway Transportation," University of Arkansas Dissertation, August 2014. (published)
2. Lucien Bruno (Eisenhower Fellow), MURP Thesis, "Contested Road Space: Public Narratives and Bus Rapid Transit in Indore, India." (published)
3. Alexander DePriest, MURP Thesis, "Bus Shelters as Shared Public and Private Entities; and Bus Shelter Advertising Contracts (BSACs), a Product and Source of Global Change: an Overview, History, and Comparison." (published)

**1.2 Websites**

Website Title	Web Address
MarTREC	<a href="http://martrec.uark.edu/">http://martrec.uark.edu/</a>
Institute for Multimodal Transportation	<a href="http://www.jsums.edu/imtrans/">http://www.jsums.edu/imtrans/</a>
Gulf Coast Center for Evacuation and Transportation Resiliency	<a href="http://www.evaccenter.lsu.edu/">http://www.evaccenter.lsu.edu/</a>
Merrit C. Becker Jr. UNO Transportation Institute	<a href="http://transportation.uno.edu/">http://transportation.uno.edu/</a>

### 2.3 Technologies or Techniques

Nothing to report

### 2.4 Inventions

Nothing to report

### 2.5 Other Products

Nothing to report

## 3. Participants & Collaborating Organizations

### 3.1 Partnerships

Organization Name	Location	Collaboration
Louisiana Transportation Research Center	Baton Rouge, LA	Supply facilities and equipment and work site sharing
University of Cal Poly San Luis Obispo	San Luis Obispo, CA	Research collaborator
Port of New Orleans	New Orleans, LA	Financial support
Port of New Orleans - WGSO 990 AM Radio	New Orleans, LA	Technology transfer partner
Arkansas State Highway and Transportation Department	Little Rock, AR	Funded \$40,000 to MKARNS project as match
Mississippi Department of Transportation, Federal Highway Administration	Jackson, MS	Mississippi Summer Transportation Institute
Engineering Research and Development Center of the US Army Corps of Engineers	Vicksburg, MS	Supported summer internship for JSU students to conduct research in MarTREC research
Transportation Research Board	Jackson, MS	Supported a JSU student as "TRB Minority Research Fellow"
Trinity Christian Community Center for Gulf Coast Environmental Health Research, and Leadership	New Orleans, LA	Collaborative research
Strategic Initiatives at Tulane University	New Orleans, LA	Collaborative research
Mid-City Neighborhood Organization	New Orleans, LA	Collaborative research
Danny Robbins / DR Railroad	Russellville, AR	worksite sharing: DR TransLoad Facilities
Glenn Bell / Southeast Arkansas Economic	Pine Bluff, AR	Collaborative research



Development District		
Jeff Pipkin / Arkansas Valley Alliance for Economic Development	Russellville, AR	worksite sharing: Russellville Chamber of Commerce
Morris Jenkins / Arkansas Economic Development Commission	Little Rock, AR	Collaborative research
Van Thomas / White River Planning and Development District	Batesville, AR	Collaborative research
Kenneth Ned Mitchell, PhD, Research Civil Engineer, US Army Engineer Research and Development Center, Coastal and Hydraulics Laboratory	Vicksburg, MS	Collaborative research

### 3.2 Other Collaborators

Organization Name	Location	Collaboration
Ms. Jennifer Neubauer, Research Project Analyst, Arkansas Department of Parks and Tourism	Little Rock, AR	Contact
Mr. Mike Armstrong, Deputy Director, Arkansas Game and Fish Commission	Little Rock, AR	Contact
Dr. Dennis Phillip Robinson,	University of Arkansas at Little Rock	Contact
Gene Higgenbotham, Executive Director, AR Waterways Commission	Little Rock, AR	Contact
Deidre Smith, Waterways Branch Manager, OKDOT	Oklahoma City, OK	Contact
Mr. Matthew Tyler Henry, Regional Economist at the U.S. Army Corps of Engineers	Little Rock, AR	Contact
Texas A&M University	Jackson, MS	Collaborator on Coastal Hazards Center of Excellence
Central Connecticut State University	Jackson, MS	Collaborator for National Summer Transportation Institute (NSTI)
Alex King / Parsons Brinckerhoff,	Glastonbury, CT	Contact
Bruce Lambert / Institute for Trade and Transportation Studies	New Orleans, LA	Contact
Charles Laggan / Arkansas Midland Railroad	Malvern, AR	Contact
Gary Hunter / Railroad Industries Inc,	Reno, NV	Contact
Gene Higginbotham / Arkansas Waterways	Little Rock, AR	Contact

Commission		
Kurt Naumann / Arkansas Economic Development Commission	Little Rock, AR	Contact
Michael Henry / Arkansas State Highway and Transportation Department	Little Rock, AR	Contact
Minghua Qiu Miller / Arkansas State Highway and Transportation Department	Little Rock, AR	Contact
Steve Jones / Arkansas Economic Development Commission	Little Rock, AR	Contact

## 4. Impacts

### 4.1. Impacts on Principal Discipline

Significant impact has been made to the maritime and multi-modal transportation field from the publication of journal articles and presentations to the community. MarTREC researchers published cutting edge work in the areas of maritime transportation logistics and coastal community urban planning. This dissemination of these research efforts will guide best practice behavior in the maritime transportation industry.

### 4.2. Impacts on Other Disciplines

The research conducted in MarTREC is guided by practitioners. Much of the work conducted by the University of New Orleans contributes to the urban planning discipline in addition to the transportation community.

### 4.3 Impacts on Transportation Workforce Development

- At the University of Arkansas, Center for Training Transportation Professional (CTTP), certified 300 students in 8 transportation-related disciplines during reporting period.
- At the University of Arkansas, 26 students participated in semester-long transportation related internships during reporting period.
- ‘On the Move’ -- a youth outreach initiative designed to introduce New Orleans area k-12 students to the educational and career opportunities in the field of transportation. 4-03; 4-10; 4-17; 4-24; 5-01; 5-06, 2014 -- Joseph S. Clark High School – 6 workshops on technical side of transportation (i.e. engineering, mathematics, computing) with the Robotics Club. 65 students total for the 6 workshops.
- Lake Area New Tech Career Day, presented to 95 high school students, 4.23.14.
- "Who Works the Rivers" career education program for 11th and 12th grade students (100 students), 4.11.14
- Louisiana Girls Leadership Academy. Location: Nicholls State University; Topic: to develop high potential leaders in community and public service through responsible citizenship; Audience: student/participants from throughout LA, parents, educators, business, women government officials, industry, general public. Attendees: 106 during workshops; 300 closing event. 85% female; 10% minority. UTC (UNO) Associate

Directors, B. Stich and C. Short serve on the advisory board of the Louisiana Center for Women in Government and Business (LCWGB), the organization that presents the event, as well as on the planning committee, June 8-11, 2014.

- JSU's "Mississippi Summer Institute (MSTI)" project of 3 week summer camp program in June 9-29, 2014. We recruited 25 high school students (96% African Americans, more than 75% females) and exposed the students in STEM knowledge and transportation career opportunities.
- JSU's MSTI summer camp program, we included pre-college training seminars and SAT/ACT introduction lectures in the program
- JSU is an HBCU university and more than 90% of the students in our university enrollment are African Americans. We have impacted the minority students and the transportation community by funding research studies in MarTREC designated areas, supporting the MSTI project to foster interests in transportation among K-12 students.

#### **4.4 Impacts on Physical, Institutional, and Informational Resources**

Nothing to report

#### **4.5 Impacts on Technology Transfer**

The Center for Training Transportation Professionals educated more than 300 technicians on state of the art transportation construction principles and standards. This makes a significant contribution to the bringing research findings to practice.

#### **4.6 Impacts on Society beyond Science and Technology**

K-12 outreach and pre-college programs reached more than 750 students and educated these students about STEM careers in the transportation-related fields. More than 50% of the participants were from underrepresented groups in the STEM field. Opening these students' minds to these types of career opportunities can have a lasting impact on the future technologically training workforce in the EPSCOR (Experimental Program to Stimulate Competitive Research) states our consortium represents.

### **5. Changes/Problems**

Nothing to report

### **6. Special Reporting Requirements**

Nothing to report