USDOT Tier 1 University Transportation Center

FAST ACT Program Progress Performance Report #1

Federal Agency: Office of the Assistant Secretary for Research and Technology

Federal Grant ID #: 69A3551747130

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, 479.575.6021

Submission Date: June 30, 2017

DUNS: 1914297450000

EIN: 71-6003252

Recipient Organization: University of Arkansas

Project/Grant Period: Start Date November 30, 2016
End Date: September 30, 2022

Reporting Period Start Date: December 1, 2016
Reporting Period End Date: May 31, 2017

Report Term or Frequency: six months

Signature: [Signature]
**Maritime Transportation Research & Education Center (MarTREC)** consortium consists of the University of Arkansas (UARK), Fayetteville, AR; Jackson State University (JSU), Jackson, MS; Louisiana State University (LSU), Baton Rouge, LA; University of New Orleans (UNO), New Orleans, LA; Texas A&M University/Texas Transportation Institute (TAMU/TTI); and Vanderbilt University (VU).

1. **Accomplishments**

1.1 **What are the major goals of the program**

<table>
<thead>
<tr>
<th>Research Effectiveness Metric</th>
<th>Annual Goal</th>
<th>6 month progress</th>
</tr>
</thead>
<tbody>
<tr>
<td># of peer-reviewed journal articles (published, accepted, submitted)</td>
<td>20/yr</td>
<td>15</td>
</tr>
<tr>
<td># of conference presentations given</td>
<td>20/yr</td>
<td>23</td>
</tr>
<tr>
<td># of students participating in transportation research projects funded by UTC</td>
<td>20/yr</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Leadership Effectiveness Metric</th>
<th>Annual Goal</th>
<th>6 month progress</th>
</tr>
</thead>
<tbody>
<tr>
<td># of national and regional leadership positions held</td>
<td>10/yr</td>
<td>32</td>
</tr>
<tr>
<td># of invited talks given</td>
<td>10/yr</td>
<td>4</td>
</tr>
<tr>
<td># of leadership and research awards received</td>
<td>3/yr</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education and Workforce Development Effectiveness Metric</th>
<th>Annual Goal</th>
<th>6 month progress</th>
</tr>
</thead>
<tbody>
<tr>
<td># of transportation-related courses offered</td>
<td>50/yr</td>
<td>29</td>
</tr>
<tr>
<td># of technician certification programs offered</td>
<td>8/yr</td>
<td>13</td>
</tr>
<tr>
<td># K-12 outreach programs offered</td>
<td>5/yr</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Technology Transfer Effectiveness Metric</th>
<th>Annual Goal</th>
<th>6 month progress</th>
</tr>
</thead>
<tbody>
<tr>
<td># of project deliverables submitted</td>
<td>5/yr</td>
<td>0</td>
</tr>
<tr>
<td># of technical briefs</td>
<td>5/yr</td>
<td>0</td>
</tr>
<tr>
<td># of editorial journal positions held</td>
<td>5/yr</td>
<td>12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Collaboration Effectiveness Metric</th>
<th>Annual Goal</th>
<th>6 month progress</th>
</tr>
</thead>
<tbody>
<tr>
<td># of existing collaborative partnerships</td>
<td>20/yr</td>
<td>2</td>
</tr>
<tr>
<td># of new collaborative partnerships formed</td>
<td>5/yr</td>
<td>2</td>
</tr>
</tbody>
</table>
1.2 What was accomplished under these goals
In this start-up phase we have conducted three consortium conference calls. Accomplishments have been in the areas of communicating policies and procedures, understanding data management plans, and sharing past, current, and potential project information among the team and possible collaboration with Army Corps of Engineers. The Center has set up its prime award and five subawards and each consortium member has access to funds and is ready to begin work. We also created and submitted our center’s approved Data Management Plan. The Center Director and Center Coordinator attended the CUTC meeting in Buffalo, New York. The next cycle will reflect research accomplishments under our goals.

1.3 How have the results been disseminated
No results at this time

1.4 Plans for next reporting period
As a FAST ACT grant recipient we look forward to being up and running with projects during the next reporting period. The faculty researchers will continue to engage with industry experts to ensure that these projects are making transformational contributions. The consortium will continue to expand our collaborative partnerships to support this. We will continue to emphasize educational and technology transfer activities. Our next annual Advisory Board meeting is November 10, 2017.

2. Products

2.1 Publications

Journal Articles

Conference Papers
4. Yin, C., L. Bu (student), and F. Wang, "Optimization of Transshipping Freight of Less than Container Load at Port Rail-Sea Container Intermodal Terminal," World Transport Convention annual meeting, Beijing, China, February 2017. (submitted)
8. Freitas, J. (student) and H. Baroud, “Impact of Climate Change and Infrastructure Risk Management on Arctic Shipping,” 12th International Conference on Structural Safety & Reliability (ICOSSAR), 2017. (under review)

Conference Presentations


Books/Other One Time Publications
Nothing to report

2.2 Websites

<table>
<thead>
<tr>
<th>Website Title</th>
<th>Web Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>MarTREC</td>
<td><a href="http://martrec.uark.edu/">http://martrec.uark.edu/</a></td>
</tr>
<tr>
<td>Institute for Multimodal Transportation</td>
<td><a href="http://www.jsums.edu/imtrans/">http://www.jsums.edu/imtrans/</a></td>
</tr>
<tr>
<td>Gulf Coast Center for Evacuation and Transportation Resiliency</td>
<td><a href="http://www.evaccenter.lsu.edu/">http://www.evaccenter.lsu.edu/</a></td>
</tr>
<tr>
<td>Merritt C. Becker Jr. UNO Transportation Institute</td>
<td><a href="http://transportation.uno.edu/">http://transportation.uno.edu/</a></td>
</tr>
<tr>
<td>Texas A&amp;M Transportation Institute</td>
<td><a href="https://tti.tamu.edu/">https://tti.tamu.edu/</a></td>
</tr>
<tr>
<td>Vanderbilt Center for Transportation and Operational Resiliency (VECTOR)</td>
<td><a href="http://www.vanderbilt.edu/vector/">http://www.vanderbilt.edu/vector/</a></td>
</tr>
</tbody>
</table>

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 Collaborative Partnerships

<table>
<thead>
<tr>
<th>Existing Partnership Name</th>
<th>Location</th>
<th>Collaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Kenneth Ned Mitchell, US Army Engineer Research and Development Center Coastal and Hydraulics Laboratory</td>
<td>Vicksburg, MS</td>
<td>research collaborator</td>
</tr>
<tr>
<td>Dr. John Renne, Florida Atlantic University</td>
<td>Boca Raton, FL</td>
<td>research collaborator</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>New Partnership Name</th>
<th>Location</th>
<th>Collaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brandon Zinser, Don Bradley, Eddie Jackson, John Gordon Central Intermodal Authority Meeting</td>
<td>Central Arkansas</td>
<td>research collaborator</td>
</tr>
<tr>
<td>Glenn Moore and Chad Johnston (DHS); Matt Kauffman (DHS HQ); James Butler (DHS HQ/Argonne National Labs); David Bertelin from Arkansas Dept. of Emergency Mgmt.</td>
<td>State and Federal</td>
<td>research collaborator</td>
</tr>
</tbody>
</table>
4. Impacts

4.1 Principal Disciplines
Nothing to report

4.2 Other Disciplines

Related External Grants
2. "Next Generation Ex-Post Analysis for Transportation Economics," (AASHTO EconWorks)
3. "A Virtually Connected Laboratory for Introducing Self-driving Car Technology through a New Mobile-learning Pedagogy," (NSF IUSE)
4. "Coastal Resilience Center of Excellence," subcontract from University of North Carolina, (DHS)
5. "Coastal Flood Risk Reduction," subcontract from Texas A&M University (NSF, PIRE project)
6. “RII Track 4: Collaborative Research to Advance Enhanced Landfill Mining,” (NSF EPSCoR)
7. “Building Louisiana coastal resilience to shocks and stressors through collaborative citizen-expert data collection, analysis, and intervention,” (Gulf Research Institute)
8. “Converting Vulnerable Landscapes to Resilient and Sustainable Community Assets,” (Metro Water Services project)

4.3 Human Resources (Transportation Workforce Development)

K-12 Programs
• During this time period the University of Arkansas Engineering Recruiting office engaged over 1000 students

Pre-College and Recruitment
• The University of Arkansas Engineering Career Awareness program (ECAP) is designed to recruit students who are underrepresented in the field of engineering, and to give these students the support they need to feel comfortable, confident and ready to succeed. The ECAP program provides financial assistance to qualifying students, but ECAP is much more than a scholarship. Starting with the three-week summer bridge program and continuing through graduation and beyond, ECAP students become part of a family.

Internships
1. One logistics internship with J.B. Hunt
2. Two Arkansas State Highway and Transportation Department internships

Short Courses and/or Workshops
1. “Use of Geospatial technologies for improving society (here and abroad)”, mini workshop held for 5 middle school girls in Dickson, TN by J. Camp and D. Martin

4.4 Physical, Institutional, and Informational Resources

Student and Professional Societies and Organizations

1. American Indian Science and Engineering Society
2. National Society of Black Engineers
3. Society of Hispanic Professional Engineers
4. Society of Women Engineers
5. Women Impacting Supply Chain Excellence
6. WTS

Leadership Positions

1. Junior Vice President of Programs, Public Sector OR Section, INFORMS
2. President Elect, American Society for Engineering Management
3. President, American Society for Engineering Management
4. Member, Advisory Council for Transportation Research, Arkansas State Highway and Transportation Department
5. Chair, ASCE Methods of Design Committee
6. Member, Transportation Research Board Committee (ABJ90 - Freight Transportation Data)
7. Sub-committee chair, TRB, (ABG20- Transportation Training and Education)
8. Special Projects Subcommittee Chair, Geo-Institute Soil Properties and Modeling
9. Member, TRB Pavement Management Committee
10. Member, TRB Emergency Evacuation Committee
11. Vice chair, AFP-40 committee, TRB
12. Education Director, University of North Carolina, Coastal Resilience Center of Excellence
13. Professional Committee, Serving as an Executive Officer (Industry Representative) for the American Society of Engineering Education’s (ASEE)
14. Subcommittee Member, Office of Marine Engineering Division (OMED)
15. Chair, Standing Committee on Emergency Evacuation, Transportation Research Board
16. Committee member, Standing Committee on Emergency Evacuation, Transportation Research Board
17. Member, TRB Intermodal Freight Transport Committee; American Society for Public Administration Section on Transportation Policy and Administration Executive Committee
18. Marine Board Member, Transportation Research Board
19. Resilience Section Committee Member, Transportation Research Board
20. ASCE /COPRI Subcommittee on Alternative Financing for Waterways Infrastructure Member
21. Chair, Committee for a Study of Propane Gas Pipeline Facilities, TRB
22. Member, Committee on Domestic Transport of Energy Products, TRB
23. Southeast Regional Vice Chair for the Professional Engineers in Higher Education (PEHE) Executive Board of the National Society of Professional Engineers (NSPE), 2016-2017.
25. Member of the ASCE Committee on America’s Infrastructure (CAI) for the development and release of the 2013 and 2017 Report Card on America’s Infrastructure (2012-Present). Representing CAI on the ASCE Excellence in Journalism Award Committee (2016-2017).
26. Member of the New Professionals Council for the Environment and Water Resources Institute, ASCE (2015-Present)
27. Creative Catalyst at The Curb Center for Art, Enterprise, and Public Policy, Vanderbilt University (2015-Present)
28. Member, Environment and Urban Planning Academy Advisory Board, Glencliff High School (2010-Present)
29. Education Outreach Chair, Nashville Section, American Society of Civil Engineers (2010-Present)
30. Reviewer for publications: (1) ASCE Journal of Infrastructure Systems; (2) Risk Analysis; (3) International Journal of Sustainable Transportation (IJST)
31. Freight Modeling Subcommittee Chair of TRB AT015: Freight Planning and Logistics Committee
32. TRB Committee Chair: Ports and Harbors

Leadership Awards

4.5 Technology Transfer

Transfer of Results
2. Interdisciplinary Data Science, Predictive Analytics, and Big Data Retreat, - Several MarTREC PI’s presented on their MarTREC projects, May 15, 2017
3. Central Intermodal Authority Meeting, April 17, 2017 – MarTREC PI’s discussed current and potential projects with central Arkansas Intermodal leaders.
5. Dr. Ned Mitchell, United States Army Corps of Engineers (USACE) Engineer Research and Development Center (ERDC) held a webinar, with all MarTREC Site Directors on May 18, 2017 to discuss current and potential project collaborations.

Editorial Journal Positions
1. Associate Editor, Operations Research Letters
2. Associate Editor, Economic Quality Control
3. Editor, International Journal of Six Sigma and Competitive Advantage
4. Editorial Board, International Journal of Quality Engineering and Technology
5. Associate Editor, Engineering Management Journal
6. Area Editor, The Engineering Economist
7. Editor Board Member, Journal of Geotechnical and Geological Engineering
8. Editorial Board Member, Journal of Frontiers of Structural and Civil Engineering (FSCE)
10. Guest Co-Editor, Journal of Advanced Transportation
12. Board Member, Transportation Research Part E: Logistics Review
4.6 Society beyond Science and Technology

Conference Planning Positions
1. Cluster Co-chair, Public Sector OR Cluster, INFORMS 2017
2. Co-chair, Road Safety and Emergency Management Section Technical Committee, 2017 World Transport Convention (WTC), Beijing, China
4. Organizing Committee Member, Smart Rivers 2017, PIANC Biennial Waterway Research Conference

Diversity
1. Presentation at the Women in Transportation Seminar (WTS), Louisiana Chapter
2. Six officially recognized diverse student societies and organizations

5. Changes/Problems
Nothing to report

6. Special Reporting Requirements
Nothing to report