Center for Advanced Multimodal Mobility Solutions and Education

CAMMSE

UNCCHARLOTTE

Annual Performance Indicators Report for University Transportation Centers

UTC 1987 2020

October 1, 2022 to September 30, 2023

Submitted by
Center for Advanced Multimodal Mobility Solutions and Education

Prepared for
Office of the Assistant Secretary for Research and Technology (OST-R)
U.S. DEPARTMENT OF TRANSPORTATION

University of North Carolina at Charlotte (Lead)	Charlotte, NC 28223
University of Texas at Austin	Austin, TX 78712
University of Connecticut	Storrs, CT 06269
Washington State University – Pullman	Pullman, WA 99164
Texas Southern University	Houston, TX 77004

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1. PROGRAM INFORMATION

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USDOT Tier 1 University Transportation Center
Annual Performance Indicators Report

Submitted to: U.S. Department of Transportation
Office of the Assistant Secretary for Research
and Technology (OST-R)

Grant Number: 69A3551747133

Project Title: Center for Advanced Multimodal Mobility Solutions
and Education (CAMMSE)

Center Director: Wei (David) Fan, Ph.D., P.E.
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Submission Date: October 24, 2023

DUNS: 06-630-0096

EIN: 56-0791228

Recipient Organization: University of North Carolina at Charlotte

Project/Grant Period: November 30, 2016 - September 30, 2024

Reporting Period Start Date: October 1, 2022

Reporting Period End Date: September 30, 2023

Report Term or Frequency: Annual Performance Indicators

Signature of Submitting Official:

2. PROGRAM-WIDE INDICATORS

University Transportation Centers Program Performance Indicators

UTC Name:	Center for Advanced Multimodal Mobility Solutions and Education (CAMMSE)
University:	Lead University: • University of North Carolina at Charlotte (UNCC) Consortium Member Universities: • University of Texas at Austin (UT Austin) • University of Connecticut (UConn) • Washington State University – Pullman (WSU) • Texas Southern University (TSU)
Grant #:	69A3551747133
Reporting Period:	October 1, 2022 - September 30, 2023

Performance Indicators	Total	UNCC	UT Austin	UConn	WSU	TSU
1. Number of transportation-related courses offered during the reporting period that were taught by faculty and/or teaching assistants who are associated with the UTC						
Undergraduate courses	22	0	5	9	2	6
Graduate courses	34	4	3	7	2	18
2. Number of students participating in transportation research projects during the reporting period funded by this grant						
Undergraduate students in research	1	0	1	0	0	0
Graduate students in research	25	5	4	5	3	8
3. Number of transportation-related advanced degree programs that utilize grant funds during the reporting period to support graduate students						
Masters level programs	5	1	1	2	0	1
Doctoral level programs	6	1	1	2	1	1
4. Number of students supported by this grant during the reporting period						
Undergraduate students	1	0	1	0	0	0

Masters students	6	0	0	0	0	6
Doctoral students	14	4	4	4	1	1

5. Number of degrees awarded during the reporting period to students supported by this grant

Undergraduate degrees	0	0	0	0	0	0
Masters degrees	6	0	1	0	0	5
Doctoral degrees	3	0	1	0	1	1

6. Number and total dollar value of research projects selected for funding during the reporting period using UTC grant funds (Federal and/or Recipient Share) that you consider to be applied research and advanced research

Number of applied research projects	7	0	2	0	0	5
Dollar value of applied research projects	$612,220.99	-	$186,814.00	-	-	$425,406.99
Number of advanced research projects	6	2	1	2	0	1
Dollar value of advanced research projects	$839,035.26	$600,000.00	$93,406.00	$62,295.00	-	$83,334.26

3. UTC-SPECIFIC INDICATORS

3.1. University of North Carolina at Charlotte

Part II – UTC-Specific Performance Indicators	
UTC Name	Center for Advanced Multimodal Mobility Solutions and Education (CAMMSE)
University	University of North Carolina at Charlotte
Grant #	69A3551747133
Reporting Period	October 1, 2022 - September 30, 2023

Category	Description of indicator	Metric
1. Research Capability	• Research results published in: *Applied Stochastic Models in Business and Industry, ASCE Journal of Transportation Engineering, Part A: System, Expert Systems with Applications, IET Intelligent Transport Systems, Journal of Safety Research, Journal of Transportation Safety & Security, Promet - Traffic&Transportation, Transportation Planning and Technology, Traffic Injury Prevention, Journal of Advanced Transportation.* • Transportation Research results presented at: the 11th International Conference on Traffic and Logistic Engineering (ICTLE 2023), the 23rd COTA International Conference of Transportation Professionals (CICTP 2023), Chang'an University International Symposium, International	• Number of refereed journal publications (12) 1. Hua, C. and Fan, W., Dynamic Speed Harmonisation for Mixed Traffic Flow on The Freeway Using Deep Reinforcement Learning, Accepted for Publication, *IET Intelligent Transport Systems,* September 2023. 2. Liu, S., Fan, W., Jiao, S. and Li, A., The Performance of Connected and Autonomous Vehicles with Trajectory Planning in a Fixed Signal Controlled Intersection, Accepted for Publication, *Promet - Traffic&Transportation*, July 2023. 3. Song, L. and Fan, W., Performance of State-Shared Multi-Agent Deep Reinforcement Learning Controlled Signal Corridor with Platooning-Based CAVs, *ASCE Journal of Transportation Engineering,*

| | | Conference on Transportation and Development (ICTD) 2023, 2023 NCDOT Research & Innovation Summit, FHWA Visit at UNC Charlotte, CEGR 6090/CEGR 8090/INES 8202 Course at UNC Charlotte, the 11th International Conference on Transportation and Traffic Engineering (ICTTE 2022), Missouri University of Science and Technology, NC Transportation Center of Excellence in Connected and Autonomous Vehicle Technology (NC-CAV), the Fifth Annual CAMMSE Research Symposium. | *Part A: System,* Volume 149, Issue 8, June 2023.
4. Islam, M.M., Newaz, A., Song, L., Lartey, B., Lin, S-C, Fan, W., Hajbabaie, A., Khan, M.A., Partovi, A., Phuapaiboon, T., Homaifar, A., Karimoddini, A., Connected Autonomous Vehicles: State of Practice, *Applied Stochastic Models in Business and Industry,* May 2023.
5. Song, L. and Fan, W., Intersection Capacity Adjustments Considering Different Market Penetration Rates of Connected and Automated Vehicles, *Transportation Planning and Technology,* Volume 46, Issue 3, pp. 286-303, February 2023.
6. Yang, T. and Fan, W., Evaluation of Transit Signal Priority at Signalized Intersections under Connected Vehicle Environment, *Transportation Planning and Technology,* Volume 46, Issue 2, pp. 145-159, February 2023.
7. Li, Y., Fan, W., Song, L. and Liu, S., Combining Emerging Hotspots Analysis with XGBoost for Modeling Pedestrian Injuries in Pedestrian-Vehicle Crashes: A Case Study of North Carolina, *Journal of Transportation Safety & Security*, January 2023.
8. Yang, T., Fan, W. and Song, L., Modelling Pedestrian Injury Severity in Pedestrian-Vehicle Crashes Considering Different Land Use Patterns: Mixed Logit Approach, *Traffic Injury Prevention*, Volume 24, Issue 2, pp. 114-120, January 2023.
9. Zhao, X.M., Gao, Y., Jin, S.J., Xu, Z., Liu, Z., Fan, W. and Liu, P, Development of a Cyber-Physical-System Perspective based Simulation |

		Platform for Optimizing Connected Automated Vehicles Dedicated Lanes, *Expert Systems with Applications,* Volume 213, Part B, 118972, March 2023. 10. Hua, C., Fan, W., Song, L. and Liu, S., Analyzing the Injury Severity in Overturn Crashes Involving Sport Utility Vehicles: A Latent Class Clustering and Random Parameter Logit Model, *ASCE Journal of Transportation Engineering, Part A: Systems*, Volume 149, Issue 3, March 2023. 11. Liu, S. and Fan, W., A Simulation Study on The Traffic Delay and Fuel Consumption of Connected and Autonomous Vehicles In Superstreet with Platooning, Signal Optimization, and Trajectory Planning, *Transportation Planning and Technology*, Volume 46, Issue 1, pp. 119-144, 2023. 12. Hua, C. and Fan, W., Freeway Traffic Speed Prediction under the Intelligent Driving Environment: A Deep Learning Approach, *Journal of Advanced Transportation*, November 2022. • Number of conference papers presented, and other presentations made (17) • Number of technical research reports published (0)
2. Leadership	• Editor-in-Chief*, International Journal of Transportation Science and Technology.* • Handling Editor, *TRR Inaugural Editorial Board of Transportation Research Record.* • Associate Editor, *IEEE Transactions on Intelligent Transportation Systems*, *ASCE*	• Editor-in-Chief (1) • Handling Editor (1) • Editorship (5) • Organizing committee chair, secretary, session chair or area editor of conference (6)

Journal of Transportation Engineering, Part A: Systems, Transportation Planning and Technology (2023-present). • Editorial Board, *Journal of World Review of Intermodal Transportation Research, Transportation Planning and Technology (2022-2023).* • Chair, 2022 CAMMSE Research Symposium. • Co-Chair, Connected and Autonomous Vehicles Section, World Transport Convention. • Secretary, TRB Committee on Light Rail Transit Systems (A0020C, AP075). • Conference Organizer and Moderator, the 22nd COTA International Conference of Transportation Professionals. • General Secretary, Board of Director, Chinese Overseas Transportation Association (COTA). • Advisory Board Member, ASCE National Artificial Intelligence (AI) Committee. • Member, ASCE National Connected & Autonomous Vehicles Impacts Committee, TRB Standing Committees (A0020C, ACP60, AP075, AHB60), WTC Shared Logistics and Transportation Systems Committee, NCDOT Fully Autonomous Vehicle (FAV) Research Working Group Committee, ASCE National Public Transport Committee, ASCE National Rail Transportation Committee, NCSITE Scholarship Committee. • Technical Reviewer, NCHRP (17-108, 08-157, 17-102), External Evaluator for University of	• Number of professional committees or board member (9) • Technical Reviewer (5)

		Sharjah, and Shenzhen Technology University.	
3. **Education and Workforce Development**	• Four existing graduate courses. • Five graduate students in CAMMSE projects. • Two degree programs in the Department of Civil and Environmental Engineering, College of Engineering, UNC Charlotte. • Four UNC Charlotte ITE student chapter seminars and twenty-six UNC Charlotte transportation graduate student weekly seminars. • The Fifth Annual CAMMSE Research Symposium.	• Transportation-related courses offered by faculty (4) • Number of students participating in CAMMSE-funded projects (5) • Number of transportation-related degree programs with students funded by CAMMSE (2) • Number of research symposium (1) • Number of transportation seminars (30) • Student scholarships or awards (4) 1. Shaojie Liu, Outstanding Reviewer Award, International Journal of Transportation Science and Technology, January 2023 2. Paul D. Cribbins Cup, Outstanding ITE Student Chapter, North Carolina Section of the Institute of Transportation Engineers, McKimmon Center, North Carolina State University, Raleigh, NC, November 17, 2022 3. Hengcong Guo, Don Blackburn Memorial Scholarship, North Carolina Section of the Institute of Transportation Engineers, McKimmon Center, North Carolina State University, Raleigh, NC, November 17, 2022 4. Yang Zhao, Roy D. Williams Memorial Scholarship, North Carolina Section of the Institute of Transportation Engineers, McKimmon Center, North Carolina State University, Raleigh, NC, November 17, 2022	

4. **Technology Transfer**	• Three presentations at the 2023 NCDOT Research & Innovation Summit • One presentation for FHWA Visit at UNC Charlotte • One presentation in CEGR 6090/CEGR 8090/INES 8202 Course at UNC Charlotte • One presentation at the 11th International Conference on Transportation and Traffic Engineering (ICTTE 2022) • One presentation at the Missouri University of Science and Technology • One presentation at the NC Transportation Center of Excellence in Connected and Autonomous Vehicle Technology (NC-CAV) • Five presentations at the Fifth Annual CAMMSE Research Symposium • One presentation at the 11th International Conference on Traffic and Logistic Engineering (ICTLE 2023) • One presentation at the 23rd COTA International Conference of Transportation Professionals • One presentation at the Chang'an University International Symposium • One presentation at the International Conference on Transportation and Development (ICTD)	• Presentations given at professional and academic meeting (17) • Number of professionals in the audience (est. 600)
5. **Collaboration**	• North Carolina DOT, Arizona State University, Carnegie Mellon University, University of Central Florida, University of Texas at Austin, Missouri University of Science and Technology, North Carolina A&T State University, and North Carolina State University in collaborative	• Number of collaborative partners (9) • Number of Center personnel involved (3)

	research and UNC Charlotte in providing cash, in-kind support, facilities, etc. • Research Collaboration with NC-CAV • Center personnel: Dr. Wei Fan, Dr. David Weggel, and Kim Wilson	

3.2. University of Texas at Austin

Part II – UTC-Specific Performance Indicators	
UTC Name	**Center for Advanced Multimodal Mobility Solutions and Education (CAMMSE)**
University	**University of Texas at Austin**
Grant #	**69A3551747133**
Reporting Period	**October 1, 2022 - September 30, 2023**

Category	Description of indicator	Metric
1. Research Capability	• Research results published in: *Research in Transportation Economics, Transportation Research Record.* • Transportation Research results presented at: the Transportation Research Board 102nd Annual Meeting, ASCE International Conference on Transportation and Development (ICTD) 2023, the Fifth Annual CAMMSE Research Symposium.	• Number of refereed journal publications (2) 1. Baumanis, C., Hall, J., and Machemehl, R., A machine learning approach to predicting bicycle demand during the COVID-19 pandemic. *Research in Transportation Economics*, 101276, March 2023. 2. Baumanis, C., Hall, J., Machemehl, R., & Wilkes, N., Perceptions of Bicycle Signal Faces and Associated Compliance: Results of an Online Survey. *Transportation Research Record*, June 2023. • Number of refereed conference proceedings (3) 1. Liu, H., Vishnoi, S., Claudel, C., *A Two-Stage Stochastic Model Considering Randomness of Demand in Variable Speed Limit and Boundary Flow Control.* Presented at the 102nd Transportation Research Board Annual Meeting, Washington, D.C. January 2023. 2. Hall, J., Sabillion, C., and Machemehl, R., *Equity as a Criterion for Transit Service Reduction During the COVID-19 Pandemic*, ASCE International Conference on Transportation and Development (ICTD) 2023, Austin, TX, June 2023. 3. Hall, J., Baumanis, C., and Machemehl, R., *Causal Analysis of*

			COVID-19 Government Interventions in Reducing Transit Ridership, ASCE International Conference on Transportation and Development (ICTD) 2023, Austin, TX, June 2023. • Number of technical reports (1) 1. Li, T. and Machemehl, R., *Developing Robust Smart Traffic Signal Control*, Technical Report for CAMMSE Research 2022 Project 07, U.S. Department of Transportation, September 2023.
2. **Leadership**		• Associate Editor, *IEEE Transactions on Intelligent Transportation Systems, ITE Journal - Institute of Transportation Engineers* • Editorial Board, *Transportation Research Part B, Transportation Research Part C, Journal of Infrastructure Systems* • Chair, TRB, Transit, Freight, and Logistics Subcommittee • Member, TRB, Transportation Network Modeling Committee	• Editorship (5) • Committee membership (2)
3. **Education and Workforce Development**		• Five undergraduate courses and three graduate courses • Three undergraduate student and seven graduate students in CAMMSE projects • One degree program in the Cockrell School of Engineering in the Civil, Architectural and Environmental Engineering Department	• Transportation related course offered by faculty (8) • Number of students participating in CAMMSE funded projects (10) • Number of transportation related degree programs with students funded by CAMMSE (1)
4. **Technology Transfer**		• Four presentations were made at the 102nd Annual Meeting of the Transportation Research Board • Four presentations were made at the Fifth Annual CAMMSE Research Symposium at UNC Charlotte	• Number of students supported by CAMMSE (2) • Number of students in courses taught by CAMMSE-related faculty members (385) • Presentations given at professional and academic meeting (11)

	• Two poster presentations and one presentation were made at the ASCE International Conference on Transportation and Development (ICTD) 2023	
5. Collaboration	• City of Austin and Austin District of TxDOT in collaborative research and UT's Center for Transportation Research providing in-kind support, facilities, etc. • National Science Foundation (NSF) on Project 2020 Project 08 • Prof. Thomaz Edison's group in ECE at UT Austin • Prof. Linda Boyle's group in Civil Engineering at University of Washington • Center personnel: Dr. Randy Machemehl, Dr. Christian Claudel, Carolina Baumanis	• Number of collaborative partners (5) • Number of Center personnel involved (3)

3.3. University of Connecticut

Part II – UTC-Specific Performance Indicators	
UTC Name	**Center for Advanced Multimodal Mobility Solutions and Education (CAMMSE)**
University	**University of Connecticut**
Grant #	**69A3551747133**
Reporting Period	**October 1, 2022 - September 30, 2023**

Category	Description of indicator	Metric
1. **Research Capability**	• Research results presented in: ASCE International Conference on Transportation and Development (ICTD) 2023, the Fifth Annual CAMMSE Research Symposium.	• Number of refereed journal publications (0) • Number of conference papers presented (1) • Rezwana, S. and N. Lownes, *Understanding the Changes in Public Perception towards Autonomous Vehicles Over Time*. ASCE International Conference on Transportation and Development (ICTD) 2023, June 2023. • Number of presentation (8) • Number of technical research reports published (2) 1. Mantri, S., Lownes, N., and Bergman, D., *Prioritizing People-Mixed Equilibrium Assignment for AV Based on Occupancy (Phase II)*, Technical Report for CAMMSE Research 2022 Project 08, U.S. Department of Transportation, September 2023. 2. Lownes, N., Rezwana, S., Shaon, R., Razaur, M., and Jackson, E., *Pedestrian Behavior and*

		Interaction with Autonomous Vehicles (Phase II), Technical Report for CAMMSE Research 2022 Project 09, U.S. Department of Transportation, September 2023.
1. Leadership	• Associate Editor, *Accident Intervention and Prevention, Journal of Transportation Safety and Security.* • Member, TRB Standing Committees (AP025, ADB10), ASCE Public Transportation Committee, Connecticut Transportation Institute	• Editorship (2) • Number of professional committees or affiliated centers (4)
2. Education and Workforce Development	• Nine undergrad course offerings and seven graduate course offerings • Four graduate students in CAMMSE projects • Degree programs in civil engineering and geography	• Transportation related courses offered by faculty (16) • Number of students participating in CAMMSE funded projects (5) • Number of transportation related degree programs with students funded by CAMMSE (4)
3. Technology Transfer	• One presentation at professional and academic meetings	• Presentations given at professional and academic meeting (1) • Number of professionals in the audience (est. 100)
4. Collaboration	• Connecticut DOT, Connecticut Transportation Institute. • Center personnel: Drs. Nicholas Lownes, John Ivan, Jin Zhu, Amy Burnicki.	• Number of collaborative partners (2) • Number of Center personnel involved (4)

3.4. Washington State University – Pullman

Part II – UTC-Specific Performance Indicators	
UTC Name	**Center for Advanced Multimodal Mobility Solutions and Education (CAMMSE)**
University	**Washington State University**
Grant #	**69A3551747133**
Reporting Period	**October 1, 2022 - September 30, 2023**

Category	Description of indicator	Metric
1. Research Capability	• Research results published in: *International Journal of Engineering, Journal of Public Transportation, International Journal of Disaster Risk Reduction, Transportation Research Part D, Philosophical Transactions of the Royal Society A, Sustainability.* • Research results presented at: the 2023 TRB Annual Meeting, the Fifth Annual CAMMSE Research Symposium, ASCE International Conference on Transportation and Development (ICTD) 2023.	• Number of refereed journal publications (6) 1. Willis, O., Zhang, Y., Reed, C., and Shi, X., Outreach Program for Middle and High School Students to Promote Transportation Engineering. *International Journal of Engineering Education,* 2023. 2. Ashraf, Md. T., Dey, K., Carrola, A., and Shi, X., Impacts of Real-time Transit Information on Transit Accessibility - A Case Study. *Journal of Public Transportation,* March 2023. 3. Ma, F., Lee, J. Y., Camenzind, D., and Wolcott, M., Probabilistic Wildfire risk assessment methodology and evaluation of a supply chain network. *International Journal of Disaster Risk Reduction,* November 2022. 4. Chen, C., Deng, Y., Li, M., and Shi, X., Key Climatic Factors Affecting Asphalt Pavement Roughness Differ in Different Climate Regions. *Transportation Research Part D: Transport and Environment*, September 2023. 5. Deng, Y., Zhang, Y., and Shi, X., Feasibility of Determining

		Asphalt Pavement Condition from Falling Weight Deflectometer Test and Finite Element Model Updating. *Philosophical Transactions of the Royal Society A*, July 2023.
		6. Zhao, J., Lee, J. Y., Camenzind, D., Wolcott, M., Lewis, K., and Gillham, O., Multi-Component Resilience Assessment Framework for a Supply Chain System. *Sustainability,* Volume 15, No.7, 6197. April 2023.
		• Number of presentations (6)
		• Number of technical research reports published (0)
2. Leadership	• Editor-in-Chief of *Journal of Infrastructure Preservation and Resilience*; Associate Editor, *Journal of Nondestructive Evaluation*; Editorial Board of *International Journal of Transportation Science and Technology.* • Director, Washington State Transportation Center; Site Director, Region 10 UTC: Pacific Northwest Transportation Consortium (PacTrans); Site Director, Tier 1 UTC: Environmentally Responsible Transportation Center for Communities of Concern (ERTC3). • Member, Transportation & Infrastructure Committee, Cold Regions Engineering Division of ASCE. • Affiliated Faculty, WSU Center for Environmental Research, Education, and Outreach, WSU Composite Materials & Engineering Center, Center for	• Editorship (3) • Number of professional committees or affiliated centers (5)

		Bioplastics and Biocomposites: A National Science Foundation I/UCRC. • Committee Research Coordinator, TRB Standing Committee on Resource Conservation and Recovery (ADC60 and now AMS20).	
3.	**Education and Workforce Development**	• Teaching the following undergraduate level course related to transportation: CE 405/505 Decision-making for sustainable and resilient civil infrastructure, and converted it into online course, 35 students • Two female faculty members, two female Ph.D. students, one international Ph.D. student contributed to CAMMSE activities	• Transportation related courses offered by faculty (4) • Number of students participating in CAMMSE funded projects (3) • Number of transportation related degree programs with students funded by CAMMSE (1)
4.	**Technology Transfer**	• Two presentations at the 2023 TRB Annual Meeting, one presentation at the Fifth Annual CAMMSE Research Symposium, two presentations at the ASCE International Conference on Transportation and Development (ICTD) 2023, one presentation at the PacTrans & WSDOT Summer High School Transportation Camp	• Presentations given at professional and academic meeting (6) • Number of professionals in the audience (210)
5.	**Collaboration**	• WSU Vancouver School of Engineering and Computer Science • Verisk Extreme Event Solutions • U.S. DOT Volpe Center • Center personnel: Dr. Xianming Shi, Dr. Jie Zhao, and Dr. Ji Yun Lee	• Number of collaborative partners (3) • Number of Center personnel involved (3)

3.5. Texas Southern University

Part II – UTC-Specific Performance Indicators	
UTC Name	Center for Advanced Multimodal Mobility Solutions and Education (CAMMSE)
University	Texas Southern University
Grant #	69A3551747133
Reporting Period	October 1, 2022 - September 30, 2023

Category	Description of indicator	Metric
1. Research Capability	• Research results published in: *Future Transportation.* • Research Results presented at: the Fifth Annual CAMMSE Research Symposium. • Invited presentations at: C2SMART virtual event, TSU Research Week, 7th Biennial Conference on the Marine Transportation System Innovative Science and Technologies Toward Greater Sustainability*.* • Published student thesis works based on their work on this project.	• Number of refereed journal publications (2) 1. Liu, J., Qi, Y., Tao, J., and Tao, T., Analysis of the Performance of Machine Learning Models in Predicting the Severity Level of Large-Truck Crashes. *Future Transportation*, 2(4), 939-955. November 2022. 2. Omosebi, O., Azimi, M., Olowokere, D., Wanyan, Y., Zhao, Q. and Qi, Y., Investigating Runway Incursion Incidents at United States Airports, accepted for publication, *Future Transportation*, September 2023. • Number of conference papers (1) 1. Zhang, Y., Alsmadi, I., Qi, Y. and Li, Z., *Trust Management and Attribute*-based *Access Control Framework for Protecting Maritime Cyber Infrastructure*, International Conference on Software and Data Technologies (ICSOFT), Rome, Italy, July 2023. • Number of student thesis published (3) • Number of presentation (8)
2. Leadership	• Associate Editor, *Current Trends in Civil & Structural Engineering, International Journal of Transportation Science and Technology.*	• Editorship (5) • Number of professional committees or affiliated centers (6)

		• Editorial Advisory Board member of *Asian Transport Studies.* • Member of Editorial Board, *Journal of Transportation Research Part D.* • Guest Editor, *Vehicles, Special Issues on Recent Developments in Intelligent Transportation System (ITS).* • Member, TRB Standing Committees (AT045, AW010, AW020, AW010(2), AW010(3)). • Member, Maritime Education, Training, and Outreach subcommittee of the Lone Star Harbor Safety Committee (LSHSC).	
3.	**Education and Workforce Development**	• Six undergrad courses and eighteen graduate courses taught. • Seven graduate students supported by CAMMSE projects. • One M.S. degree program in the College of Science, Technology and Engineering at TSU and one Ph.D. degree in school of Education. • Organized one Workshop: *"L.E.A.D – Leadership, Excellence, Achievement and Development Workshop".* • Co-organized and sponsored a summer school @ TSU with the Department of Transportation Studies. • Organized four CAMMSE-ITE joint seminar*.	• Transportation related courses taught by associated faculty (24) • Number of faculty in transportation areas (4) • Number of students participating in CAMMSE funded projects (8) • Number of transportation related degree programs with students funded by CAMMSE (2) • Number of seminars and workshops (7)

4. **Technology Transfer**	• During the reporting period, TSU published two peer-reviewed journal papers, one conference paper, and eight presentations. In addition, three CAMMSE sponsored students published their thesis works in ProQuest.	• Number of peer-reviewed journals (2) • Number of conference papers (1) • Number of student theses published (3) • Number of presentation (8)
5. **Collaboration**	• Collaborate with the Argonne National Laboratory, City of Houston, Houston BCycle, Houston METRO, TxDOT and Texas District of the Institute of Transportation Engineers (ITE). • Collaborate with peer universities to develop several new proposals. • Center personnel: Drs. Yi Qi, Lei Yu, Mehdi Azimi	• Number of collaborative partners (6) • Number of Center personnel involved (3)

Center for Advanced Multimodal Mobility
Solutions and Education