FLORIDA ATLANTIC UNIVERSITY
COLLEGE OF ENGINEERING & COMPUTER SCIENCE
Department of Civil, Environmental & Geomatics Engineering

Freight Mobility Research Institute

A Tier 1 USDOT University Transportation Center

Annual Report

2017 2018

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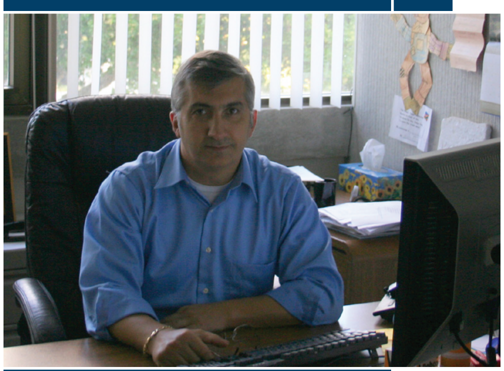


LETTER FROM THE DIRECTOR

I am very pleased to provide this annual report for the Freight Mobility Research Institute (FMRI) activities from 2017-2018. It is my pleasure and honor to direct the FMRI, a Tier 1 University Transportation Center housed in the Department of Civil, Environmental and Geomatics Engineering within FAU's College of Engineering and Computer Science. Our Institute was one of only 20 institutes selected for funding from the United States Department of Transportation (USDOT) in 2016.

The FMRI partners consist of a collaboration of faculty, researchers, and students, coming from Florida Atlantic University (lead), Hampton University, Portland State University, Texas A&M University (College Station), University of Florida, University of Memphis, and the University of Minnesota (Minneapolis).

Our highly skilled group of individuals have the expertise and experience required to address the critical issues affecting planning, design, operation, and safety of the nation's intermodal freight transportation systems. The FMRI's research goals are to improve freight mobility through information technology, freight network modeling, and operations, intermodal logistics, as well as freight and supply chain sustainability. This collaborative research aims to promote smart cities, improve multi-modal connections, system integration and security, data modeling, and analytical tools for optimizing freight movements. The Institute also will have a significant educational impact through integrated education and outreach components.

The FMRI's mission is to strengthen our nation's economic competitiveness by embracing innovative research projects in order to create efficient and safe freight systems, train current and future transportation leaders and workforce, and to engage with industry to enhance collaboration between agencies.

Dr. Evangelos I. Kaisar

Professor & Director

Freight Mobility Research Institute, Florida Atlantic University

GOALS & OBJECTIVES

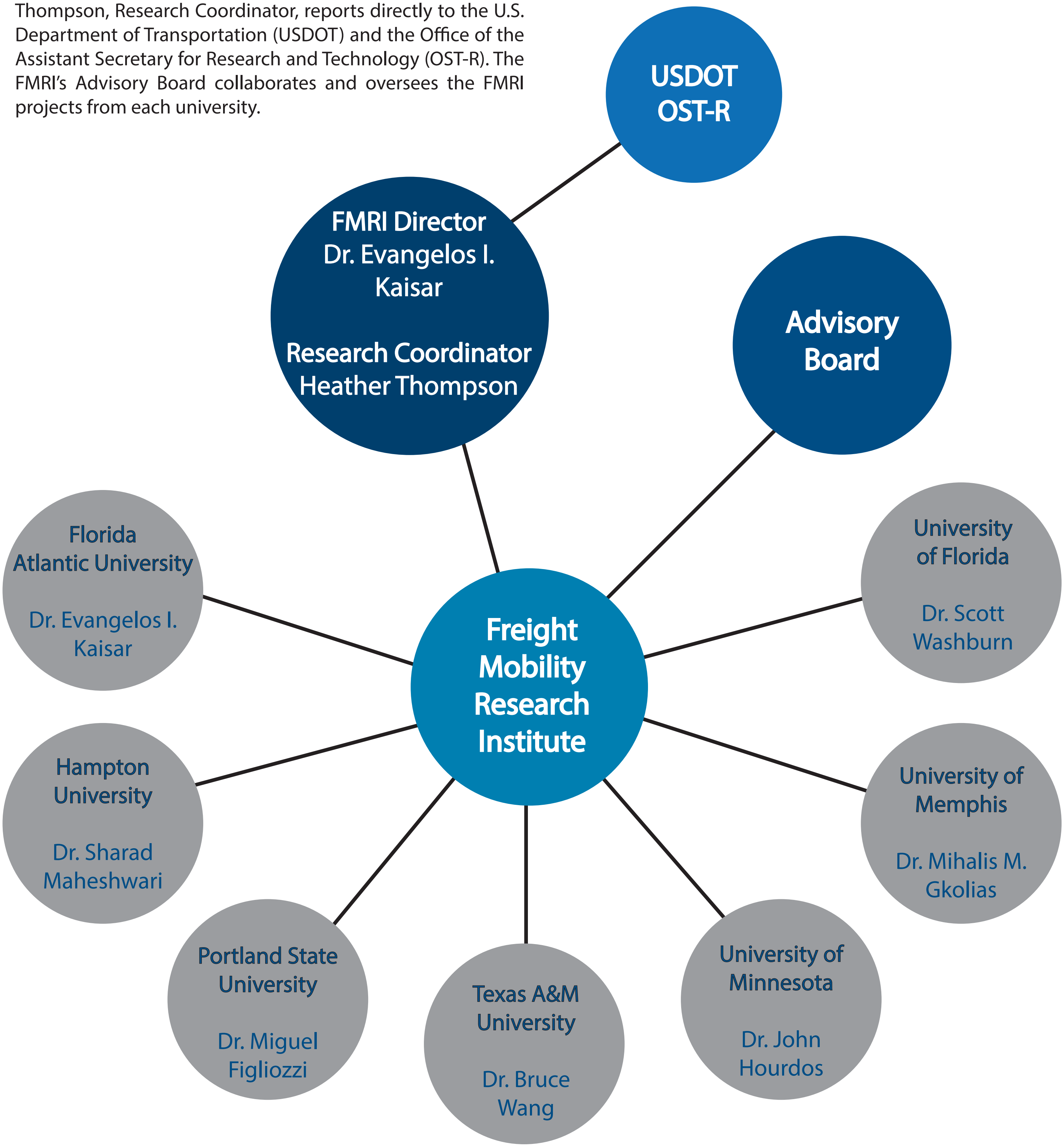
The Freight Mobility Research Institute's (FMRI) contribution focuses on promoting smart cities, improving multimodal connections, system integrations and security, data modeling, and analytical tools. The ultimate goal of the FMRI is to optimize freight movements for improving the overall freight transportation efficiency.

The FMRI's mission is to address critical issues affecting planning, design, operation, and safety of the nation's intermodal freight transportation systems, in order to strengthen nation's economic competitiveness. Efficient and safe freight movement is inextricably linked to the economic vitality of a local area, state, region and beyond. In consultation with stakeholders, as well as the USDOT's strategic priorities, the FMRI members focus their research on improving freight mobility through information technology, freight network modelling and operations, intermodal logistics, as well as freight and supply chain sustainability. The researcher's efforts (i) support maintaining and developing mobility in the face of growing traffic and shrinking resources; (ii) develop methodologies for improving the performance of the U.S. freight transportation system; (iii) increase border-crossing efficiency while maintaining security and resilience; and (iv) improve air quality for improving public health, reducing energy consumption, and congestion.

The FMRI assembled top experts on freight transportation, network modeling, sustainability, and ITS, representing leading universities across the nation with deep connections to local, state, and regional communities. Each university has an established transportation research center/lab where leading-edge research can be conducted. All the FMRI partners are motivated to embrace innovative research projects, train current and future transportation leaders and workforce, and engage with the industry to enhance collaborations between agencies by improving efficiency and safety, sustainability, reduced traffic congestion, and develop standards to ensure interoperability today and in the future. At the same time, the center has a significant educational impact. The consortium members have a successful history of enhancing interdisciplinary learning opportunities and engaging underrepresented groups. This commitment will be continued and improved via integrated education and outreach components that leverage ongoing activities.

Organizational Chart

The FMRI consists of seven university partners, led by Florida Atlantic University. Dr. Evangelos Kaisar, Director, and Heather Thompson, Research Coordinator, reports directly to the U.S. Department of Transportation (USDOT) and the Office of the Assistant Secretary for Research and Technology (OST-R). The FMRI's Advisory Board collaborates and oversees the FMRI projects from each university.



FMRI Team and Advisory Board

FMRI Executive Committee

Evangelos I. Kaisar, Ph.D.
Institute Director
Florida Atlantic University

Mihalis M. Gkolias, Ph.D.
Associate Director
University of Memphis

John Hourdos, Ph.D.
Associate Director of Research
University of Minnesota

Sharad Maheshwari, Ph.D.
Associate Director of Education
Hampton University

FMRI Research & Education Team

Evangelos I. Kaisar, Ph.D.
Professor & Director of the FMRI
Florida Atlantic University

Sabyasachee Mishra, Ph.D.
Assistant Professor
University of Memphis

Miguel Figliozzi, Ph.D.
Professor
Portland State University

Bruce Wang, Ph.D.
Associate Professor
Texas A&M University

Mihalis M. Gkolias, Ph.D.
Associate Professor
University of Memphis

Scott Washburn, Ph.D., P.E.
Professor
University of Florida

John Hourdos, Ph.D.
Research Associate Professor
University of Minnesota

Yunlong Zhang, Ph.D.
Professor
Texas A&M University

Sharad Maheshwari, Ph.D.
Professor
Hampton University

FMRI Key Staff

Evangelos I. Kaisar, Ph.D.
Institute Director
Freight Mobility Research Institute
Florida Atlantic University

Heather Thompson
Research Coordinator
Freight Mobility Research Institute
Florida Atlantic University

Stavroula Manta
Assistant Research Coordinator
Freight Mobility Research Institute
Florida Atlantic University

FMRI Advisory Board

Charles Edwards
Director, Strategic Planning/Logistics
North Carolina Department of Transportation

Rickey Fitzgerald
Rail and Motor Carrier Manager
Florida Department of Transportation

Bob Hillier
Transportation Planning/Freight Coordinator
City of Portland, Bureau of Tranportation

Caitlin Hughes
Director, Office of Freight Management and Operations
Federal Highway Administration
United States Department of Tranportation

Nicole Blackwell Katsikides
Associate Research Scientist, Freight Mobility Analysis
Texas A&M Transportation Institute

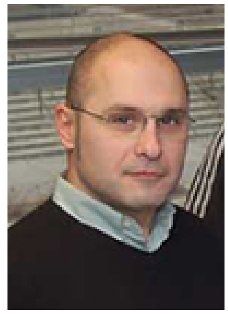
Beth R. Kigel
President & CEO
Palm Beach North Chamber of Commerce

Cynthia Borrum Matthews
Manager, Operations Planning and Engineering
FedEx Corporation

Dan Murray
Vice President
American Transportation Research Institute

Bill Rogers
Senior Program Officer
National Cooperative Freight Research Program

FMRI Partner Biographies



Dr. John Hourdos is the Director of the Minnesota Traffic Observatory and a Research Associate Professor in the Department of Civil, Environmental, and Geo-Engineering at the University of Minnesota. Dr. Hourdos has been a full time researcher with the Civil Engineering department since 1996. Dr. Hourdos has extensive experience with the theoretical and practical aspects of traffic flow theory and modeling, as well as traffic safety. His current research focuses on Traffic Operations optimization, evaluation of Active Traffic Management systems, and Macro-Meso-Micro hybrid simulation modeling and applications.

Dr. Chen-Fu Liao is a senior research associate in the Department of Mechanical Engineering at the University of Minnesota-Twin Cities. His research interests are in the area of data systems, navigation and development of assistive technologies for decision support. His recent research includes fright performance analysis using probe vehicle data and vehicle classification using inductive loop signature technology. Dr. Liao has over 16 years of experience in embedded computing, data analysis, wireless communications, and intelligent transportation systems.

Portland State
UNIVERSITY

Dr. Miguel Andres Figliozzi is a Professor in the Civil and Environmental Department at Portland State University. Prof. Figliozzi directs the multidisciplinary Transportation Technology and People (TTP) lab and has published extensively in the area of innovative freight vehicle technologies, urban deliveries, city logistics, routing-logistics optimization, and emissions and transportation sustainability.

Dr. Bruce Wang is an Associate Professor at Texas A&M University. His expertise is mainly in the area of freight logistics and operations research. He is active member with TRB and other transportation organizations.

TEXAS A&M
UNIVERSITY.

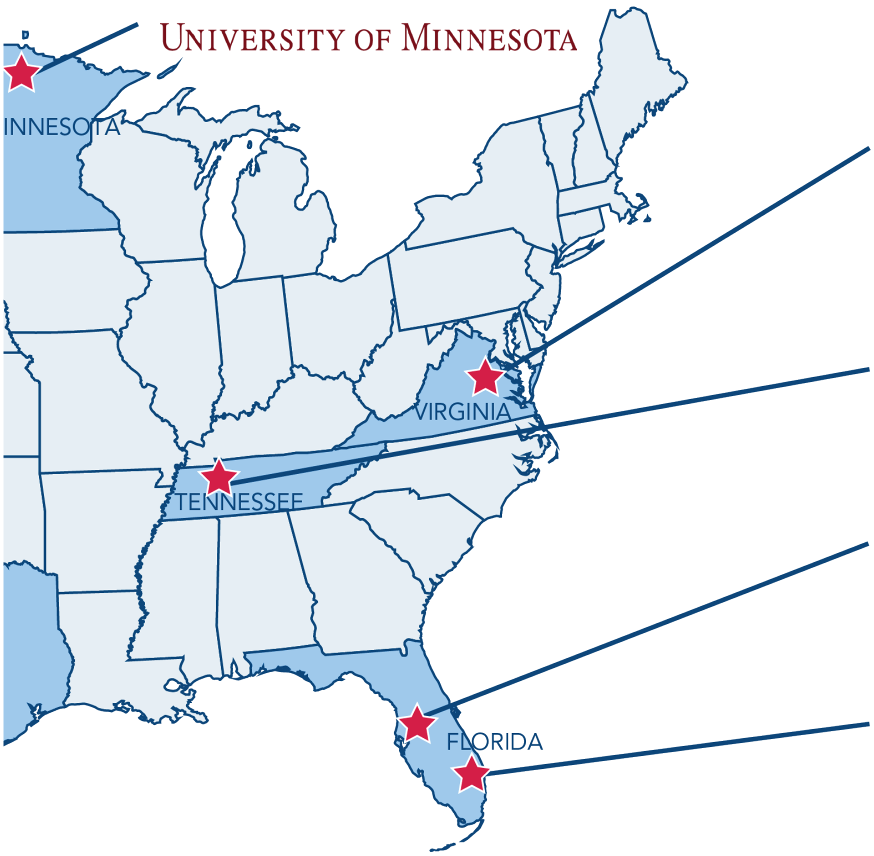
Dr. Scott Washburn is a Professor in the Department of Civil and Coastal Engineering at the University of Florida. Dr. Washburn's areas of expertise include traffic flow theory, traffic operations analysis, traffic simulation model development and testing, development of traffic analysis and level of service computational methodologies and complementary software tools. Dr. Washburn's primary research efforts are aimed at improving and enhancing traffic analysis methods, particularly those contained in the Highway Capacity Manual (HCM). Of particular focus in his efforts is commercial vehicles; namely, more realistic modeling of the vehicle dynamics and better understanding of driver perceptions of level of service.

Dr. Yunlong Zhang is a Professor at Texas A&M University. His expertise Include modeling and simulation, traffic operations, and signal optimization. He is active member with TRB and other transportation organizations.

Dr. Sharad K. Maheshwari is a Professor in the Department Business Administration at the Hampton University. His main area of teaching and research interests are supply chain management, transportation management, distracted driving, quality management, project management and business education. He has worked on several grants from the US Department of Transportation. He was associate director of education and technology transfer of the Hampton University's UTC.

Dr. Mihalis M. Golias is an Associate Professor with the Department of Civil Engineering at the University of Memphis. He is the chair of the Standing Committee on Ports and Channels of the Transportation Research Board (TRB), National Academies of Science (NAS); the co-Director of the Biologistics Cluster, FexEx Institute of Technology at the University of Memphis, and the Associate Director of the Freight Mobility Research Institute at Florida Atlantic University. His teaching and research covers the areas of maritime and freight transportation; physical network vulnerability; capital/operational resource allocation for network improvements; and multi-level multi-criteria decision making.

University of Minnesota

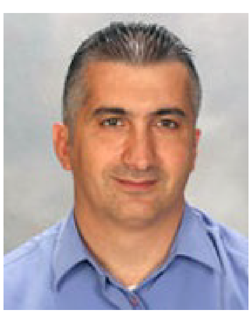


HAMPTON UNIVERSITY
THE STANDARD OF EXCELLENCE

THE UNIVERSITY OF MEMPHIS

UF UNIVERSITY of FLORIDA

FAU
College of Engineering & Computer Science
Florida Atlantic University



Dr. Evangelos I. Kaisar is a Professor and Director of the Geomatics and Transportation Engineering program at the Department of Civil, Environmental and Geomatics Engineering at Florida Atlantic University. In addition, Dr. Kaisar is the Director of the Freight Mobility Research Institute (FMRI) a USDOT TIER 1 Transportation Center. Prior to coming to Florida Atlantic University, he was a project manager for the Maryland Transportation Authority (MdTA). Dr. Kaisar is an expert in transportation systems analysis, large scale mathematical modeling, traffic management, logistics, and preparedness catastrophic management. Dr. Kaisar has over fifteen years of experience in research and education, as well as, vast experience in managing research programs and administrative expertise.

Dr. Sabyasachee Mishra, is Assistant Professor of Civil Engineering and the co-director of FedEx Institute of Technology at the University of Memphis. His expertise includes travel demand modeling, network investment decision making, transportation planning, economics, and impact of disruptive technological innovations on transportation. He is involved with a number of national and state Transportation projects from U.S. Department of Transportation (USDOT), Federal Highway Administration, Tennessee DOT, Maryland State Highway Administration, Maryland DOT, and Michigan DOT.

FMRI Performance Measures

23
# of professional or peer presentations

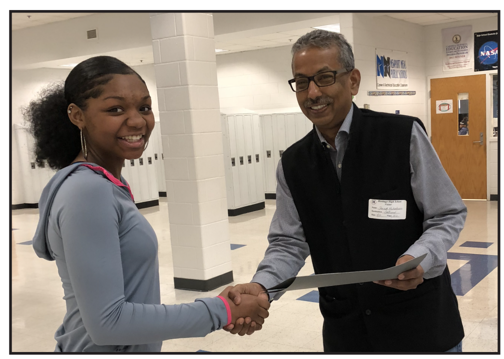
2
# of courses developed

2
# of workshops and webinars

3
# of cost-share projects

9
# of journal publications

10
# of educational initiatives



7
# of projects funded

14
# of student participation in seminars and conferences

19
# of research students

9
# of summer interns

FMRI Timeline and Milestones

December 2016

FMRI received USDOT award to improve the nation's mobility of goods

January 2017

Student Poster Showcase & CUTC Meeting at the Annual TRB Meeting in Washington, DC

First FMRI partner meeting at FAU

February 2017

FMRI website launched

April 2017

FDOT Mobility Division visited the FMRI at Florida Atlantic University

June 2017

First FMRI and USDOT partner meeting at FAU

2017 CUTC Annual Summer Meeting in Buffalo, NY

Established the first educational activities:

- Creation of new graduate course at FAU: CGN:5935 Advanced Transportation Operations & Logistics Management
- Transportation Summer Camp at FAU for middle school students
- Summer Transportation Institute at Hampton University

July 2017

Year 1 projects established

November 2017

FMRI co-sponsored the 5th Annual UTC Southeastern Region Conference

January 2018

FMRI participated in the TRB Annual Meeting in Washington, DC

CUTC Meeting & FMRI partner meeting in Washington, DC

March 2018

Second FMRI partner meeting at FAU

June 2018

CUTC Annual Summer Meeting in Minneapolis, MN

Year 2 projects established

June/July 2018

Transportation Summer Camp at FAU for middle school students

FMRI Funded Projects | Year 1 Projects

Modeling the Sustainability of Commercial Vehicle Technologies - Phase I

Dr. Miguel Figliozzi

The integration of more sustainable vehicles in goods distribution and service delivery depends on a number of factors related to vehicle costs, technology, infrastructure, energy sources, and financial incentives (Feng and Figliozzi, 2012). Energy cost fluctuations and the rapid evolution of vehicle types and engine technologies creates a highly uncertain environment. Problems and issues faced by policymakers, transportation planners, and private companies are rapidly evolving over time. In addition, new vehicle technologies such as unmanned aerial vehicles (UAVs) or drones have the potential to disrupt last mile deliveries and supply chains.

The comparison of conventional diesel vehicles and cleaner vehicles is not straightforward because there are substantial trade-offs regarding vehicles costs, payload, range, and supporting infrastructure. The comparison is even more complex regarding UAVs since this is a new vehicle type and technology. There is scant or no research that addresses the fundamental environmental, logistics and cost trade-offs associated with the widespread adoption of UAVs for last mile deliveries.

The main goal of this project is to develop robust tools and models to analyze UAVs environmental, logistical, and cost tradeoffs. More specifically, the research project will: (1) review and analyze key UAV characteristics, limitations, and capabilities, (2) model and compare UAV and conventional ground vehicle lifecycle emissions and sustainability aspects, (3) model and compare UAV operational and long-term costs, and (4) analyze the potential impacts of widespread UAV adoption on freight planning models and tools.

Eco-Driving Study on Trucks along Signalized Arterial with Significant Freight Traffic

Dr. Yunlong Zhang & Dr. Bruce Wang

Eco-driving is a concept of reducing fuel consumption and greenhouse gas emissions through changing driving behaviors. Along with a signalized arterial, frequent driving mode changes in decelerating, stopping/idling, and accelerating contribute to elevated levels of fuel consumption and emissions. Because of the extra distance and time needed for deceleration and acceleration of heavy trucks, and because of the significantly alleviated fuel consumption rate and emission rates during the acceleration processes of these trucks, the driving decisions of the trucks not only have major impacts on the mobility but also have significant environmental and economic impacts.

The objective of this research is to develop eco-driving strategies by optimizing the speed profiles of the trucks along a signalized arterial to minimize fuel consumption and emission while maintaining good mobility of the corridor. Two significant differences exist between this proposed study and prior studies. Firstly, the study has a focus on trucks which have distinct characteristics in acceleration, deceleration, and speed. These characters will have significant impacts on traffic operations as well as fuel consumption and emissions for an arterial with significant freight traffic. Secondly, this study will specifically consider market penetration and compliance rate of eco-driving from truck drivers and other drivers. The market penetration and compliance rates will significantly affect the results of optimization and also call for different modeling approaches, from a deterministic one to one that is probabilistic and considers uncertainties.

The optimization is based on current traffic conditions including current truck speed modes and the queuing conditions at the downstream intersection and also based on the current signal states including SPaT data. A queue detection algorithm considering the connected vehicle market penetration rate will be considered. Evaluations will be made for different scenarios of traffic and signal conditions with both a macroscopic procedure and a microscopic approach that integrates EPA's MOVES models with a microscopic traffic simulation program (VISSIM). The optimization solutions based on mobility considering trucks as well as cars will also be compared with those that minimize fuel consumption and emissions, and integrated optimization strategies will be explored.

This research will also explore the additional benefits in mobility, fuel consumption, and air quality by considering the interactions of signal control and truck eco-driving decisions under a connected operation environment. Trucks will be assumed to be connected (or have a high market penetration rate) and communicate with the infrastructure (signal control), and the benefits from the combination of eco-driving decisions in real time and adaptive signal control will be further evaluated, and strategies and methodology for real-time implementation will be explored.

Game Theory Applications for Seaport Cooperation, Competition, and Co-Opetition

Dr. Mihalis Gkolias & Dr. Sabyasachee Mishra

Applications of game theory in maritime transportation (ports and liner shipping network in specific) has been on the rise in the last decade (Lee and Song, 2017) and one research direction that has been proposed is the development of models that can capture cooperation/competitions between marine container terminal operators (MCTOs) and liner shipping companies. MCTO and/or port cooperation especially seems like a natural reaction to the rapid changes in the liner shipping industry in the form of new (and perhaps unstable) alliances and demand/supply volatility. In this project, we investigate the applicability of game theory models (e.g., multi-objective, Bertrand/Nash equilibrium problems -with or without equilibrium constraints-, Nash Bargaining and Equilibrium, Stackelberg etc.) to model cooperation, competition, and co-opetition between marine container terminal operators (MCTOs), seaports, and liner shipping alliances. The objective is to develop a mathematical framework that will maximize port revenues, minimize port costs and increase freight fluidity through our nation's seaports.

FMRI Funded Projects | Year 1 Projects continued

Enhancement of Transportation Network Analysis Tools for Truck-related Planning and Operations

Dr. Scott Washburn

The state-of-the-art in traffic operations analysis methods that explicitly consider the impacts of large trucks has improved considerably over the last decade. Micro-simulation tools and deterministic analytic methods such as those in the Highway Capacity Manual (HCM) offer reasonably robust methods for explicitly accounting for large trucks. However, there are still several areas where improvements in the methods and the tools are needed. Two areas, in particular, are network-level analysis and travel time reliability analysis, and even more so, the combination of these two areas. Conducting the network-level analysis entails the modeling of traffic assignment that can accurately forecast the truck flow distribution.

However, most of the existing models do not work well due to their restrictive assumption that the passenger car equivalent (PCE) value of trucks is flow-independent, i.e., the PCE value is given and does not vary with traffic conditions. Such an assumption is not consistent with the HCM, although it can simplify the model. On the other hand, while micro-simulation is very suitable for performing network-level analysis, the computational burden can become unreasonable when travel time reliability analysis is factored in, as this will increase the number of simulation runs several-hundred fold. The HCM includes methods for analyzing travel time reliability, but only at the facility level.

This project aims to improve the state-of-the-art for accounting for the impact of trucks at the network level. This will be accomplished in two ways: (1) extending the methodology for multiclass user-equilibrium (UE) traffic assignment to account for flow-dependent PCEs of trucks, and (2) using the HCM freeway facility analysis methodology to calculate travel time in the UE route choice methodology instead of the traditional BPR (Bureau of Public Roads) function.

Identify Potential Causes of Truck Bottlenecks on Freeways and Develop Mitigation Strategies

Dr. Chen-Fu Liao & Dr. John Hourdos

Freight transportation provides a significant contribution to our nation's economy. Reliable and accessible freight network enables business in the Twin Cities to be more competitive in the Upper Midwest region. Accurate and reliable freight data on freight activity is essential for freight planning, forecasting and decision making on infrastructure investment. Building on our previous research to measure freight mobility and reliability along key freight corridors in the Twin Cities metro area, this project will leverage our previous development for assessing truck congestions and travel time reliability to identify and investigate potential causes of truck bottlenecks and develop mitigation strategies on major truck highway corridors in the 8-county metro area. In addition, we will also include key freight corridors that connect to the regional freight centers in St. Cloud, Mankato, and Rochester areas. We plan to investigate potential causes of truck bottlenecks for recurring and non-recurring congestion conditions by merging truck volume and congestion information on a GIS framework for spatial analysis. We also propose to develop a systematic reporting tool to rank truck bottlenecks truck highway corridors. This tool will allow agencies to monitor the truck bottlenecks and evaluate the impact of deployed mitigation strategies on a regular basis.

The objectives of this project are to (1) identify truck bottlenecks and assess congestion impact, (2) examine and analyze trucking activity nearby congested areas and investigate possible causes of recurring congestions, (3) develop and recommend potential mitigation solutions for improving system performance for all users, and (4) develop a systematic reporting tool to rank truck bottlenecks and use the tool to evaluate the impact of deployed mitigation strategies.

Modeling Adoption of Autonomous Vehicle Technologies by Freight Organizations

Dr. Sabyasachee Mishra & Dr. Evangelos Kaisar

Over the last few years, a rapid explosion of new technologies has created opportunities to address critical freight transportation challenges in urban, suburban and rural areas. Some examples of new technologies include expansion of e-commerce, 3-D printing, deliveries by unmanned aerial vehicles (UAVs or drones), and potential applications of automated and connected vehicles in freight transportation (e.g. truck platooning). These new technologies are also influencing consumer behavior and thereby reshaping freight supply chains at the urban, regional, and international level.

The autonomous vehicle technologies use new features including smartphones, vehicle fleet tracking (GPS, and location-based systems), sensors (V2V, V2I), enhanced imaging technologies, and other sources that arise from broader smart city initiatives. While the fully autonomous vehicle technology is yet to come, some of the new features are already available and some freight organizations are already adopting them. These new technologies and data sources are creating new challenges for freight planners in identifying the potential non-adopters and adopters. In addition, how the adoption will vary over time. Adoption methods available from consumer behavior research are mostly based on individuals and limited to organizations. The general adoption methods cannot be directly used in modeling adoption of freight organizations.

The main objectives of this project are to (1) review rapidly emerging technologies affecting freight planning and operations, (2) survey stakeholders to identify their inclination, and (3) outline future research steps necessary to meet future local agencies, MPOs and state DOTs freight planning and performance evaluation needs.

FMRI Funded Projects | Year 1 Projects continued

Truck Parking Study: Unveiling the Parking Space density and Truck Volume relationship: Phase I

Dr. Bruce Wang & Dr. Yunlong Zhang

Truck parking has been a national concern for many years. There are several reasons behind it. One is that truck driving and on-duty hours are regulated by the federal law for the sake of traffic safety. Truckers cannot drive for more than 7 hours within any consecutive 24 hours of time. Truckers, especially those for inter-city travel, must find a resting spot when the driving hours reaches its federally enforced limit. Due to unavailability of truck parking space at locations, it is needed, truckers are often found to park illegally on highway ramps or other unsafe spots. Alternatively, some truckers are caught driving beyond the hours limit, which significantly contributes to the highway fatality rate.

The objective of this study is to study the relation between truck volume and parking space density in a simulation environment as Phase I. The truck space availability issue is essentially one between volume and density subject to boundary conditions. The intuitive observation is that a higher volume demands more parking space statistically. The boundary condition is that there must be a minimum density no matter how low the volume is. In realistic situations such as those along the corridors of I-94 in Wisconsin and Minnesota as well as I-35, HW29 in Iowa and Texas, the team believes that there must be an inherent relationship between the space needed and the truck volume. The study means is a computer simulation, which allows to flexibly examining all different situations along the interstate highways in terms of volumes and density. The goal is to explore a statistical formula for this relationship in a hope that policymakers may use to examine the adequacy of truck parking space within their jurisdiction areas.

FMRI Cost-Share Projects

Guidance for Identifying Corridor Conditions that Warrant Deploying Transit Signal Priority and Queue Jump

Dr. Evangelos Kaisar

The primary objective of this project is to develop a guidance for transit agencies in identifying corridor conditions that warrant Transit Signal Priority (TSP) and queue jump. Guidance regarding minimal threshold for citeria in evaluating the suitability of a corridor for TSP and queue jump will be developed.

Funded by: Florida Department of Transportation

Measure of Truck Delay and Reliability at the Corridor Level

Dr. Chen-Fu Liao & Dr. John Hourdos

This project aims to measure truck performance measures using the National Performance Measurement Research Dataset (NPMRDS) from the USDOT. We worked with stakeholders to identify key freight corridors with recurring congestion in peak periods in the Twin Cities Metro Area (TCMA). We will use 24 months of NPMRDS data to measure travel time reliability and estimate truck delay at corridor level and to identify system impediments during peak periods.

Funded by: Minnesota Department of Transportation

Commercial Heavy Vehicle Impacts on Signalized Arterial Corridor Performance

Dr. Scott Washburn

The objective of this research is to identify improvements that can be made to the Highway Capacity Manual (HCM) urban streets analysis method that will better account for the impacts of commercial vehicles on arterial corridor operations. This study showed some significant differences between the measured saturation flow rate values and those calculated from the new HCM approach and showed that two seconds is not even sufficient for a traffic stream of 100% passenger cars.

Funded by: Florida Department of Transportation

FMRI Educational Initiatives

Lectures & Workshops

Traffic and Freight Operations Lecture

Dr. John Hourdos from the University of Minnesota presented a traffic and freight operations lecture at the Wayzata High School in Plymouth, MN, as part of the Wayzata Honors Mentor Connection.

September 13, 2017

Logistics Lecture Series

Dr. Sharad Maheshwari and Dr. Kelwyn D'Souza from Hampton University hosted a lecture series about reverse logistics in Johnson & Johnson procurement and inventory analysis., as well as Canon supply chain. The lecture series was attended by Hampton University faculty members from the School of Business, as well as students. The lectures were very well-received and included information on global supply chain, local supply chain, production, warehousing, material management, inventory reduction, operations, and logistics.

September 2017/April 2018

Lessons Learned from Hurricanes: Evacuation & Resilience

Dr. Evangelos Kaisar from Florida Atlantic University participated in the "Lessons from Hurricane Irma for Increasing Resilience: From Practice to Revising Plans and Policy." The workshop was hosted by the Center of Urban & Environmental Solutions (CUES) of FAU.

November 28, 2017

High School STEM Teachers Workshop

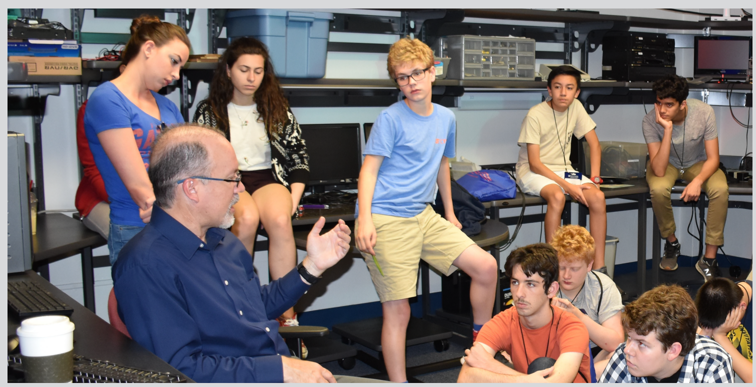
STEM teachers from Heritage High School participated in a workshop at Hampton University. The objective is to encourage high school teachers to include lesson elements of logistics and transportation in order to expose young students to the engineering field.

December 9, 2017

High School Essay Competition

Hampton University sponsored an essay competition at Heritage High School in Newport News, Virginia. The essays focused on issues dealing with land, air, and water transportation modes related to freight logistics. The purpose is to encourage high school students to research important issues related to freight transportation.

April 16, 2018



UF Gator Computing Camp

Dr. Scott Washburn hosted a 2-hour session for University of Florida's Gator Computing Camp. The lecture focused on computing in transportation engineering to a group of high school students interested in the field.

June 12, 2018

FMRI Summer Transportation Camps

The Freight Mobility Research Institute holds Summer Transportation Camps at Florida Atlantic University and the Summer Transportation Institute at Hampton University. The transportation camps cover topics such as port resilience, automated and connected vehicles, smart cities, public transportation, planning, safety, communications, logistics, and freight operations. FAU students are also exposed to engineering programs, such as ArcGIS based spatial analysis and VISSUM-based intersection simulations, while HU students went on field trips to facilities, created team-oriented projects, and listened to guest speakers.

Summer 2017/2018

FMRI Presentations

Kaisar E., “Freight Mobility Research Institute (FMRI).” Florida Chamber of Commerce, Trade and Logistics Meeting, Lakeland, FL, March 2017.

Ali S., Zerpa L., Kaisar E., “Guidance for Implementing Transit Signal Priority”, FSITE Summer Meeting 2017, Naples, FL, June 2017.

Figliozzi, M., “A Study of Unmanned Aerial Vehicles Energy and CO2 Emissions Efficiency.” City Logistics Conference, Phuket, Thailand, June 2017.

Figliozzi, M., “Drones for Commercial Last-Mile Deliveries: A Discussion of Logistical, Environmental, and Economic Trade-offs.” University of Toronto CEE Seminar, Toronto Canada, September 2017.

Kaisar E., “Freight Mobility Research Institute (FMRI): Challenges”, Florida Department of Transportation, Tallahassee, FL, September 2017.

Dhanak M., Kaisar E., “Port Resiliency Assessment Tool.” MSC Annual Review Meeting by the Department of Homeland Security, Washington DC, October, 2017.

Figliozzi, M., “Modeling Unmanned Aerial Vehicles (Drones) Costs.” INUF Conference, Long Beach, CA., October 2017.

Ali S., Kaisar E., Hadi M., “Guidance for Identifying Corridor Conditions that Warrant Deploying Transit Signal Priority.” 5th Annual UTC Conference for the Southeastern Region, November 2017.

Kaisar E., Ali S., Charisis A., “Port Recovery in the Aftermath of Oil Spill Incident.” 5th Annual UTC Conference for the Southeastern Region, November 2017.

Manta S., Kaisar E., Vlahogianni E., “Evaluation of Bus Routes Efficiency Using Data Envelopment Analysis (DEA) and Free Disposal Hull (FDH) Approaches.” 5th Annual UTC Conference for the Southeastern Region, November 2017.

Ali S., Zerpa L., Kaisar E., Masters K., “Guidance for Identifying Corridor Conditions that Warrant Deploying Transit Signal Priority.” 97th Annual Meeting of the TRB, Washington, DC, 2018.

Figliozzi, M., “A Study of Unmanned Aerial Vehicles Energy and CO2 Emissions Efficiency.” 97th Annual Meeting of the TRB. Washington, DC, January 2018.

Henesey L., Kaisar E., Dhanak M., "Experiences in Resilience for Global Ports and Terminals." 97th Annual Meeting of the TRB. Washington, DC, 2018.

Kaisar E., Gundersen E., "Data Envelopment Analysis Model for Assessment of Safety and Security of Intermodal Transportation Facilities." 97th Annual Meeting of the TRB, Washington, DC, 2018.

Kong X., Eisele W., Zhang Y. and Cline D., “Evaluating the Impact of Real-Time Mobility and Travel Time Reliability Information on Truck Drivers’ Routing Decisions.” Transportation Research Board 97th Annual Meeting, January 2018.

Pujats* K., Golias M.M., Mishra S., “Marine Container Terminal Cooperation: A Nash Bargaining Approach.” 97th Annual Meeting of the TRB. Washington, DC, 2018.

Kaisar E., “FMRI research updates.” Broward Metropolitan Planning Organization's Freight Transportation Advisory Committee Meeting, April 2018.

Figliozzi, M., “How Sustainable Are Drone (UAV) Deliveries?” PSU Transportation Seminar. Portland, OR, April 2018.

Charisis A., Kaisar E., "Containership Routing and Scheduling with Multiple Time Windows." 5th Biennial Marine Transportation System Research and Development Conference, June 2018.

Kaisar E., “Short Sea Shipping vs. Trucking: A Cost-Benefit Analysis Using Mathematical Modeling.” 5th Biennial Marine Transportation System Research and Development Conference, June 2018.

FMRI Presentations | continued

Simpson, J., Mishra, S., Talebian, A., Golias, M., and Kaisar, E., "Disaggregated Prediction of Adoption Rate of Autonomous Trucks by Freight Organizations." Autonomous Vehicles Symposium, San Francisco, CA, 2018.

Figliozzi, M.*, Tucker C., and Polikakhina P., "Drone Deliveries Logistics, Efficiency, Safety and Last Mile Trade-offs." ILS Conference, Lyon, France, July 2018.

FMRI Publications

Figliozzi, M. A., "Lifecycle Modeling and Assessment of Unmanned Aerial Vehicles (Drones) CO2e Emissions." Transportation Research Part D: Transport and Environment, 57, 251-261, 2017.

Kong X., Eisele W., Zhang Y. and Cline D., "Evaluating the Impact of Real-Time Mobility and Travel Time Reliability Information on Truck Drivers' Routing Decisions." Transportation Research Board 97th Annual Meeting, 2018.

Pujats* K., Golias M.M., Mishra S., "Marine Container Terminal Cooperation: A Nash Bargaining Approach." 97th Annual Meeting of the TRB, Washington, DC, 2018.

Chen C., Zhang X., Yao Y., Zhang Y., Rong J., and Liu X., "Driver's Eco-Driving Behavior Evaluation Modeling Based on Driving Events." Journal of Advanced Transportation, 2018.

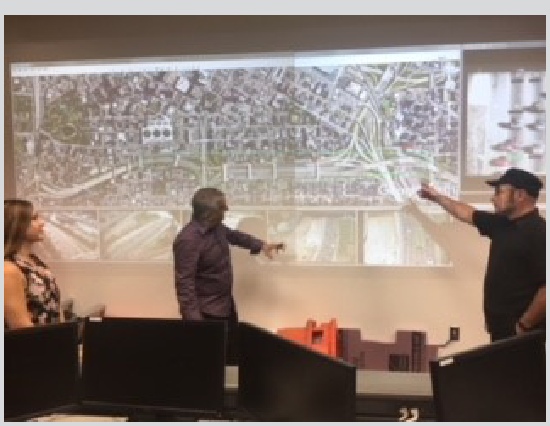
Liao, C. "Measure of Truck Delay and Reliability at the Corridor Level." Cost-Share Final Project, 2018.

Kamonthep T., Zhang Y., and Ye X., "Platoon Recognition Algorithm Using Connected Vehicle Technology." Journal of Intelligent Transportation Systems Technology Planning and Operations, 2018.

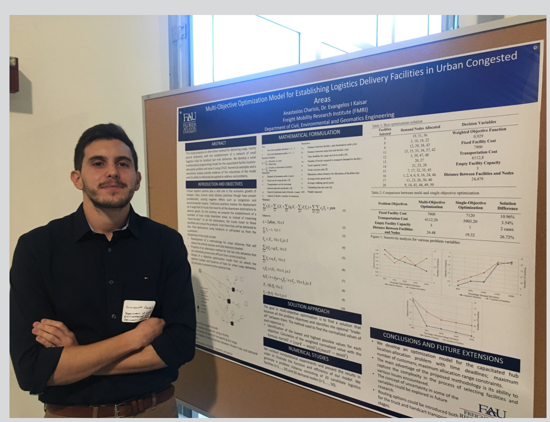
Kong X., Eisele W., Zhang Y. and Cline D., "Evaluating the Impact of Real-Time Mobility and Travel Time Reliability Information on Truck Drivers' Routing Decisions." Transportation Research Record, 2018.

Wu,Y., Zhao, X., Rong J., and Zhang Y., "The Effectiveness of Eco-Driving Training for Male Professional and Non-Professional Drivers." Transportation Research Part D: Transport and Environment, Vol. 59, pp 121-133, 2018.

Simpson, J., Mishra, S., Talebian, A., and Golias, M., "Disaggregated Prediction of Adoption Rate of Autonomous Trucks by Freight Organizations." Transportmetrica-A: Transportation Science (Under review).



The FMRI is dedicated to the development of student education and research. Our student researchers have a hands-on experience with our research projects, classroom instruction, and other educational initiatives. The Institute aims to prepare students for real issues plaguing the transportation industry in the betterment of mobility.



ITE Student Chapter Activities

The Institute of Transportation Engineers (ITE) Student Chapter is constantly looking for new ways to involve more students. The ITE hosts distinguished speaker series in both spring and fall semesters at the Boca Raton campus. Affiliated faculty, students, and staff from the departments of Civil, Environmental, & Geomatics Engineering; Computer & Electrical Engineering & Computer Science; and Ocean & Mechanical Engineering regularly attend the series.

Guidance for Identifying Corridor Conditions that Warrant Deploying Transit Signal Priority and Queue Jump

MD Sultan Ali — March 1, 2017
Research Assistant, Florida Atlantic University

Introduction of Women's Transportation Seminar (WTS), Area of Transportation Engineering and Benefits of WTS

Somaye Fakharian, Ph.D. — April 12, 2017
Lead ITS Engineer, WSP

Opportunities for Enhancing the Robustness and Functionality of the Dedicated Short-Range Communications (DSRC) Infrastructure Through the Use of Satellite Digital Audio Radio Service (DARS)

Richard A. Michalski — April 18, 2017
Principal Chief Engineer, Sirius XM
Christa Petros
VP of Product Development, Sirius XM

Evaluation of Pedestrian and Bicyclist Performance Measures by Using Crowd Monitoring Technologies in Southeastern Florida

Bratislov Ostojic — September 20, 2017
Research Assistant, Florida Atlantic University

Data-Based Decision Support: A Journey from Data to Information

Yan Xiao, Ph.D., P.E. — October 25, 2017
Research Associate, Florida International University

Improve the Level of Service of Free-Floating Bike Sharing - Its Connectivity with Freight Applications

Yu Zhang, Ph.D. — November 8, 2017
Associate Professor, University of South Florida

Applications of Game Theory to Container Terminals

Mihalis M. Gkolias, Ph.D. — December 6, 2017
Associate Professor, University of Memphis

Dynamic Modeling and Perimeter Control in Large-Scale Urban Networks

Nikolas Geroliminis, Ph.D. — December 20, 2017
Associate Professor, École Polytechnique Fédérale de Lausanne

Self-Driving Books - How our Standard Practices will Change in the Age of Connected Vehicles

Eric Lindstrom, P.E., PMP — February 21, 2018
Associate Engineer, Kittelson & Assoc.
Nathalie Rodriguez Sosa
Engineering Associate, Kittelson & Assoc.

Freight Mobility Research Institute aims to contribute to the life-long learning of transportation engineering. Along with the classroom experience, educational initiatives sponsored by the FMRI would provide opportunities to students to become familiar with the numerous fields of transportation engineering and gain practical experiences and knowledge. The FMRI is a proud affiliate of the Institute of Transportation Engineering. The ITE Student Chapters from participating universities closely collaborate with the FMRI to organize educational events, lectures, and conferences for promoting the center's work.

MD Sultan Ali, Officer (far left)
Anastasios Charisis, Treasurer (center left)
Dr. Evangelos Kaisar, Advisor (center)
Stavroula Manta, President (center right)
Bratislov Ostojic, Officer (far right)