

Spring
2023

The National Transportation Center at Morgan State University is pleased to present its bi-annual newsletter. This issue highlights the launch of our new research center, technological contributions made by our PIs, and our discussions with a variety of media outlets. We encourage you to follow our upcoming publications and educational webinars to stay up to date on the latest in transportation research.



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New SMARTER Center to Launch this Year

Morgan State University has been tapped to lead [the SMARTER Center](#), a USDOT University Transportation Center (UTC) established in partnership with Howard University, University of Delaware, University of Maryland, University of Pittsburg, University of Virginia, Virginia Tech, and West Virginia University. Morgan State will be the first HBCU and the first university in Maryland to lead a regional UTC.

The Center will work with the region's state Departments of Transportation and other public and private sector partners to facilitate innovation, strategic planning, and the development of a diverse transportation workforce in the Mid-Atlantic. The consortium has been awarded a \$15 million federal grant from to carry out its research and education program.

The University will helm the organization amid growing transportation challenges for the region. Food deserts, rising transit costs, and congestion along ports and interstate corridors have threatened to hamper regional economic development in recent years. Challenges caused by climate change, especially flooding, are expected to constrain transit networks as well, often with

disproportionate impacts on less affluent communities.

The Center's research activities will focus on providing immediate and near-immediate implementation capabilities for policy makers, industry, and the public at large. Its researchers will explore novel applications for emerging technologies like machine learning, connected and automated vehicles, and electric vehicles to strengthen the region's transportation network.

The UTC's leadership have emphasized their commitment to community involvement, a principle which they say informs the consortium's efforts to engage underserved communities and community-based organizations in research and workforce development initiatives. Equity and sustainability considerations are thus at the forefront of the Center's efforts to improve mobility in the region, and expanding multimodal transit options, both for rural urban travelers, remains a key priority in meeting those ends.

View the full DOT announcement and a comprehensive list of grantees [here](#).

NTC Researchers Receive Transportation Research Board Award

A Paper submitted by UMEC researchers was selected as one of the top-rated papers of this year's TRB Conference.

"Investigating the Traffic Behavior of Bicyclists in Interaction with Car Users on Shared Bike Lanes Without Physical Barriers" was submitted by Dr. Anam Ardesheri, Dr. Eazaz Sadeghvazeri, and Dr. Mansoureh Jeihani.



Celebrating Women in STEM at the National Transportation Center

Women have made achieved greater representation in a variety of disciplines over the last several decades. Engineering and Transportation, despite their historic male bias, have been no stranger to this trend.

CBS News Baltimore visited the National Transportation Center this month to discuss the Center's ongoing research and the challenges women in STEM fields experience with Director Mansoureh Jeihani. Dr. Jeihani has led the NTC since 2020 and is the first woman to serve as Director.

"In different seminars and conferences, I have been the only woman in the room or one of very few women in the room. Sometimes it's intimidating, but I learned I can do it, Dr. Jeihani told CBS. "And usually we have to work harder, much harder, to show that we are capable of that."

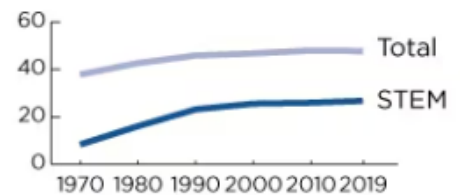
The interview was held at the NTC's Safety and Behavioral Analysis Lab, where students and researchers have been using the facility's state-of-the art testing equipment to evaluate work zone practices, distracted driving behavior, and other topics in transportation safety. The CBS segment showcased how Morgan State University students have been making use of lidar sensors to gather three-dimensional data from the area's four-way intersections.

The Transportation Research Board, an organization which regularly publishes NTC research, similarly recognized the work Dr. Jeihani and the Center have done to mentor women in the STEM field.

"I'm incredibly proud of the meaningful work that I and the other women of color at the National Transportation Center have done to support our students. Education & hands-on experience remain the best ways for women in the field to break barriers," Dr. Jeihani told the board.

NTC researchers, many of whom are women and immigrants, are following in the Director's example by pursuing Ph.D.'s and publishing high-quality research in a variety of transportation sub-fields, from cycling infrastructure and autonomous vehicles to safety assessments and demographic analyses.

Percentage of Women in US Labor Force



Source: US Census Bureau



Two Patents Awarded to NTC Researchers

UMEC researchers have been awarded two patents for their outstanding technological contributions to the transportation field.

The first is method by which vehicles can communicate with traffic infrastructure to optimize their speed, thereby improving fuel efficiency and throughput throughout the entire traffic system. The invention also presents promising applications for use in autonomous vehicles.

The second patent is a small, autonomous vehicle designed to transport wheelchair users with little to no input from the traveler during their trip. This vehicle can drastically improve mobility and independence for those who depend on wheelchairs to get around.

Congratulations to the talented transportation professionals who keep the NTC on the cutting edge of the industry.

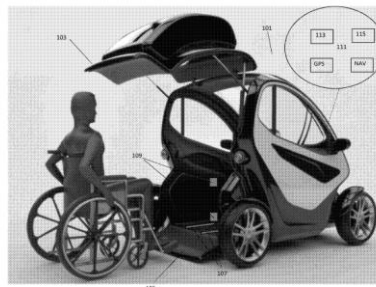
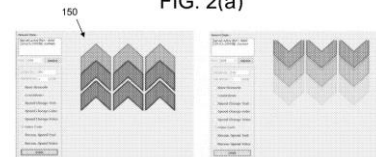


FIG. 2(a)



UMEC Researcher Recognized for Analysis of Baltimore's Transit Deserts

UMEC Researcher Ramina Javid has won the 2023 GIS for Transportation Symposium Student Paper Contest. Her study, "Identifying Transit Deserts in Baltimore City: Equity Analysis Using GIS" applies spatial analysis techniques to locate neighborhoods in the city that lack essential transit services, providing valuable data for future research and policy.

Researcher Spotlight: Hesham Rakha

Dr. Hesham Rakha, Director of the Center for Sustainable Mobility at Virginia Tech, was recently named a fellow by the ASCE Board of Direction. Dr. Rakha has 35 years of experience in transportation research, having published over 540 peer-reviewed papers and book chapters. His exceptional contributions to the Urban Mobility & Equity Center frequently explore novel bicycle modeling methods and promote the use of this sustainable transportation method in an integrated, multimodal transit system.





Making Sense of Rising Gas Prices

Among the many economic shocks to hit Americans in 2022, none were as persistent—or visible—as rising gas prices. The average price for a gallon of regular gasoline peaked at nearly \$5 in mid-June, a \$2 increase from its price a year earlier and a \$3 increase from average prices in 2020.

While inflation has affected many of the commodities that Americans regularly buy, gas prices have a unique psychological impact on the way we think about government and the economy. NTC Director Mansoureh Jiehani spoke with reporters at NBC News and the New York Times to discuss why.

“When the gas price changes, it changes everything,” said Jiehani. “It gradually causes rising prices in many items as transportation costs rise, and people know it. That’s why there’s a panic every time the gas prices go up.”

These feelings are amplified by the specific limitations of the American transportation system. The United State is uniquely car-centric, and many parts of the country lack even basic public transit options. While micro-mobility programs like electric scooter rentals and bikeshare have become more widespread, the necessity of personal automobiles for medium- and long-distance trips means that traveling invariably becomes more expensive when gas prices go up.

“We need gas to go to work, get groceries, healthcare, to take our kids to school.” Dr. Jiehani told NBC News. “There is no quick and easy substitute. In most parts of the country, there is no integrated and reliable transit system.”

Growing public interest in passenger rail and buses have the potential to ease Americans’ reliance on cars and gasoline. Until multimodal transit systems become common across the United States, urban and rural communities alike will be vulnerable to sudden price hikes.

National Average Gas Price



Source: GasBuddy, CNBC

VOLUNTEER Drivers Needed

We are always looking for individuals to participate in our driving simulator studies. It’s fun, safe, and contributes to valuable transportation research.

Sign up now at:

bit.ly/3FVQXuQ

STAY INFORMED

Visit our Website

The best way to stay up to date on UMEC’s research and technology transfer activities is to visit our website at

<https://morgan.edu/umec>



Ongoing and Completed UMEC Projects

COMPLETED

Investigating the Effect of Connected Vehicles (CV) Route Guidance on Mobility and Equity; Dr. Mansoureh Jeihani, Dr. Ali Haghani (University of Maryland)

Multi-depot and Multi-school bus Scheduling Problem with School Bell Time Optimization; Dr. Ali Haghani (University of Maryland)

Integrated Optimization of Vehicle Speed Control and Traffic Signal Timing: System Development and Testing; Dr. Hao Chen (Virginia Tech), Dr. Hesham Rakha (Virginia Tech), Dr. Mansoureh Jeihani

EQUITABLE COMPLETE STREETS: Data and Methods for Optimal Design Implementation; Dr. Cinzia Cirillo (University of Maryland), Dr. Mansoureh Jeihani, Dr. Paul Schonfeld (University of Maryland)

Developing an Intelligent Connected Vehicle based Traffic State Estimator; Dr. Hesham Rakha, Ahmed Abdelrahman, Dr. Hossam Abdelghaffar (all from Virginia Tech)

Impact of COVID-19 on Ridehailing and Other Modes of Transportation; Dr. Jianhe Du, Dr. Hesham Rakha, (both from Virginia Tech)

Developing Optimal Peer-to-Peer Ridesharing Strategies; Dr. Young-Jae Lee, Dr. Amirreza Nick

Optimum Connected Vehicle Speed Control on Signalized Roadways in Mixed Flow; Dr. Hao Chen (Virginia Tech), Dr. Hesham Rakha (Virginia Tech), Dr. Mansoureh Jeihani, Dr. Eazaz Sadegh

Bicyclist Longitudinal Motion Modeling; Dr. Hesham Rakha (Virginia Tech), Dr. Karim Fadhioun (Virginia Tech), Dr. Mansoureh Jeihani

How Mobility and Accessibility Affect Crime Rates: Insights from Mobile Device Location Datav

Dr. Lei Zhang, Mofeng Yang, Guangchen Zhao, Aref Darzi, Sepehr Ghader (all from University of Maryland)

Advanced Mobility for People with Disability: Autonomous Wheelchair Pilot Deployment at the BWI; Dr. Mansoureh Jeihani, Dr. Kofi Nyarko, Dr. Eazaz Sadeghvaziri, Dr. Cynthia Glass

Investigating Walking and Biking Activities Among Low-Income Americans; Dr. Eazaz Sadeghvaziri, Dr. Mansoureh Jeihani

Shared Bus/Bike Lane Safety Analysis: Assessing Multimodal Access and Conflicts; Dr. Celeste Chavis, Dr. Cinzia Cirillo (University of Maryland)

ONGOING

The Effect of COVID-19 on Mobility and Equity: A Case Study on Transit Users in Baltimore, MD; Dr. Mansoureh Jeihani, Dr. Celeste Chavis

Integrated Optimal Transit Network Design with MaaS Implementation; Dr. Young-Jae Lee, Dr. Amirreza Nickkar

The Typology of Transportation Accessibility: A Qualitative and Quantitative Meta-Analysis; Dr. Hyeon-Shic Shin

User Preference Analysis for Mobility-as-a-Service (MaaS) and Its Impact in Maryland; Dr. Young-Jae Lee, Dr. Hyeon-Shic Shin, Dr. Paul Schonfeld (University of Maryland)

Fare-Free Public Transportation: A full-scale real-world experiment in Arlington, Virginia; Dr. Cinzia Cirillo (University of Maryland), Dr. Hesham Rakha (Virginia Tech)

Analysis of Interrelated Network Improvement Alternatives; Dr. Paul Schonfeld (University of Maryland), Dr. Hesham Rakha (Virginia Tech)

Changes of Bikeshare and Other Non-Automobile Modes of Transportation During Covid; Dr. Jianhe Du, Dr. Hesham Rakha

Optimization of Vehicle Trajectories Considering Uncertainty in the Vicinity of Actuated Traffic Signals; Dr. Hesham Rakha, Amr Shafik, Seifelddeen Eteifa

Quantifying the Impact of C-V2x on Transportation system Efficiency, Energy and Environment; Hesham Rakha, KyoungHo Ahn

View all ongoing and completed UMEC projects at <https://www.morgan.edu/umec>.