



New Jersey Department of Transportation

24th Annual NJDOT Research Showcase



Advancing Equity in Transportation

NEW JERSEY DEPARTMENT OF TRANSPORTATION
24th ANNUAL NJDOT

RESEARCH SHOWCASE

OCTOBER 26, 2022

Conference Center at Mercer
1200 Old Trenton Road
West Windsor, NJ 08550

24TH ANNUAL NJDOT RESEARCH SHOWCASE

The **Annual New Jersey Department of Transportation (NJDOT) Research Showcase** is an opportunity for New Jersey’s transportation community to experience the broad scope of ongoing academic research initiatives and share technology transfer activities being conducted by institutions of higher education (IHE) partners and their associates. The Research Showcase is an important means for sharing knowledge and highlighting the benefits of transportation research, including NJDOT’s own program. Awards will be presented for research implementation, innovation, and recognition of outstanding university students studying in a transportation-related field.

This year’s Showcase theme, “Advancing Equity in Transportation” serves as the organizing frame for the remarks of our keynote speaker and panelists during the morning session. Executive Order 13985, **Advancing Racial Equity and Support for Underserved Communities Through the Federal Government**, issued on January 20, 2021, established a “whole of government approach” to advancing equity and opportunity at the Federal level and offers the following key definitions:

Equity – The term “equity” means the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment, such as Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality.

Underserved Communities – The term “underserved communities” refers to populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life, as exemplified by the list in the preceding definition of “equity.”

In response to the Executive Order 13985, the USDOT prepared its **Equity Action Plan** (January 2022) which highlights key actions that USDOT will take to expand access and opportunity to all communities while focusing on underserved, overburdened and disadvantaged communities.

Attendees at today’s event are encouraged to read the *Equity Action Plan*, a living document, which lays the foundation for institutionalizing equity in USDOT’s programs and policies. USDOT identified four focus areas – Wealth Creation, Power of Community, Interventions, and Expanding Access – to guide its equity advancement activities. These activities place people and communities at the center of USDOT’s equity efforts and should prove of continuing relevance to state, regional and local partners and other stakeholders in the private, non-governmental and academic sectors.

AGENDA

- 8:30 A.M. **Sign in and Networking**
Atrium
- 9:00 A.M. **Introduction and Housekeeping**
David Maruca, Program Development Administrator, Rutgers Center for Advanced Infrastructure and Transportation
- 9:10 A.M. **Welcome and Introductory Remarks**
Auditorium

Michael Russo, Assistant Commissioner, Planning, Multimodal, and Grants Administration, New Jersey Department of Transportation
- 9:15 A.M. **Opening Remarks**
Parth Oza, Acting Assistant Commissioner, Capital Program Management, New Jersey Department of Transportation
- 9:30 A.M. Valeriya Remezova, Deputy Division Administrator, Federal Highway Administration New Jersey Division
- 9:35 A.M. **Keynote Address**
Keith Benjamin, Associate Administrator for Highway Policy and External Affairs, Federal Highway Administration
- 10:20 A.M. **Research Poster Exhibit and Break** (Rooms 214/215)
- 10:40 A.M. **Perspectives on Advancing Equity in Transportation Panel Discussion**
Elkins Green, Director, Environmental Resources, New Jersey Department of Transportation

Veronica Murphy, Director's Office, Division of Local Aid & Economic Development, New Jersey Department of Transportation

Krishna Murthy, President, EZ Ride

Andrew Tunnard, Assistant Commissioner Transportation Operations Systems & Support, New Jersey Department of Transportation

Byron Nicholas, Supervising Transportation Planner, Hudson County Engineering
- 11:45 A.M. **Presentation of 2022 Awards**
Presented by Amanda Gendek, Manager, Bureau of Research, New Jersey Department of Transportation

 2022 Outstanding University Student in Transportation Research Award
 2022 NJDOT Research Implementation Award
 2022 Best Poster Award
 2022 NJDOT Build a Better Mousetrap Award
- 12:00 P.M. **Buffet Lunch and Research Poster Exhibit**
Additional lunch seating in rooms 122, 123
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CONCURRENT BREAKOUT SESSIONS

Presenters selected from abstract solicitation by NJDOT

- 1:10-1:35 P.M. **EQUITY AND MOBILITY**
Dining Room | Moderator: Omid Sarmad, Rutgers Center for Advanced Infrastructure and Transportation
Real-Time Traffic Signal System Performance Measure Phase II
Presenter: Peter J. Jin, Rutgers University-CAIT

CONCURRENT BREAKOUT SESSIONS continued

INFRASTRUCTURE

Auditorium | Moderator: Ryan Stiesi, Rutgers Center for Advanced Infrastructure and Transportation
Corrosion Performance of Ultra-High Performance Concrete in Uncracked and Cracked Beams
Presenter: Seyed Masoud Shirkhorshidi, New Jersey Institute of Technology

SAFETY

Room 216 | Moderator: Shane Mott, Rutgers Center for Advanced Infrastructure and Transportation
Development and Evaluation of a Pedestrian Crossing Alert System Using 2-Channel LiDAR Sensor
Presenter: Branislav Dimitrijevic, New Jersey Institute of Technology

1:45-2:10 P.M.

EQUITY AND MOBILITY

Dining Room | Moderator: Omid Sarmad, Rutgers Center for Advanced Infrastructure and Transportation
Assessing High-Resolution Connected Vehicle Data for TSM & O Applications
Presenter: Zijia Zhong, New Jersey Institute of Technology

INFRASTRUCTURE

Auditorium | Moderator: Ryan Stiesi, Rutgers Center for Advanced Infrastructure and Transportation
Design of Lego-Inspired Reconfigurable Modular Blocks for Automated Construction of Engineering Structures
Presenters: Rojyar Barhemat, Soroush Mahjoub, Victor C. Li, Yi Bao, Stevens Institute of Technology

SAFETY

Room 216 | Moderator: Shane Mott, Rutgers Center for Advanced Infrastructure and Transportation
Emerging Countermeasures for Pedestrian Safety: A Review of State of Art and Recent Advances
Presenters: Anahita Kakhani, Rowan University

2:20-2:45 P.M.

EQUITY AND MOBILITY

Dining Room | Moderator: Omid Sarmad, Rutgers Center for Advanced Infrastructure and Transportation
Factors Influencing the Fatality of Pedestrian and Bicyclist Involved Crashes in New Jersey
Presenter: Hannah Younes, Rutgers University-VTC

INFRASTRUCTURE

Auditorium | Moderator: Ryan Stiesi, Rutgers Center for Advanced Infrastructure and Transportation
Developing Electrically-Heated Flexible Pavement for Self-Deicing Application
Presenter: Ashith Padinhare And Marath Purakkal, Rowan CREATES

SAFETY

Room 216 | Moderator: Shane Mott, Rutgers Center for Advanced Infrastructure and Transportation
Complete and Green Streets: Effective Public Engagement Practices and Resources to Promote Safety and Advance Equity
Presenter: Sam Rosenthal, Rutgers University-VTC

1:10-2:45 P.M.

2022 RESEARCH POSTER EXHIBIT

Rooms 214/215

Decision Aided Cost and Construction Time Estimates for the Gateway Tunnel Project
Presenter: Ehsan Mehryaar, New Jersey Institute of Technology

Simulating Corrosion Induced Damage in Recycled Aggregate Concrete Systems
Presenter: Jin Fan, New Jersey Institute of Technology

Minimizing Total Cost of Work Zones on Two-Lane Roads with Managed Lanes
Presenter: Ahmed Edrees, New Jersey Institute of Technology

A Framework for Proactive Safety Evaluation of Intersection Using Surrogate Safety Measures and Non-Compliance Behavior
Presenter: Deep Patel, Rowan University

A Review on Seat Belt Compliance of Drivers and Front Passengers: Data Collection, Analysis, and Countermeasures
Presenter: Omar Al-Sheikh, Rowan University

Feasibility Study of Shared Mobility Programs as a First/Last-Mile Solution in Underserved Communities: A Case Study in Camden City, NJ

Presenter: Ruqaya Alfaris, Rowan University

Zero-Emission Bus Fleet: A Review of State Practices, Recent Developments, and Future Directions

Presenter: Zahra Vafakhah, Rowan University

How Distraction Triggers Speeding: An Observational Case Study in New Jersey

Presenter: Ahmed Sajid Hasan, Rowan University

Three-Dimensional Finite Element Modeling of Cold In-Place Recycled Asphalt Sections in Accelerated Pavement Testing

Presenter: Chenchen Huang, Cheng Zhu, Yusuf Mehta & Daniel Offenbacher, Rowan University

Use of 100% RAP for Repair Purposes

Presenter: Dr. Faisal Kabir, Rowan University

Recommendations for Improving NJDOT Specifications for Cold In-Place Recycling

Presenter: Ahmed Saidi, Rowan University

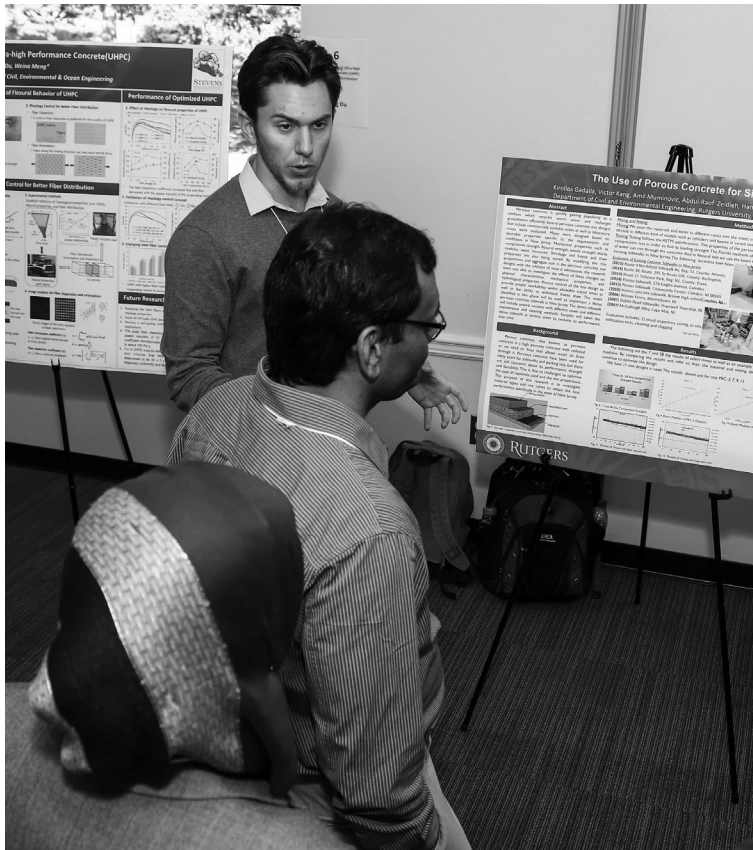
Assessment of the Impact of Binder grade on the Laboratory Performance of Fiber-Reinforced Asphalt Mixtures

Presenter: Ali Reza Khan, Ayman Ali, Yusuf Mehta, Rowan University

3:00 P.M.

ADJOURN

This program is organized by the NJDOT Bureau of Research in partnership with the Rutgers Center for Advanced Infrastructure and Transportation (CAIT) and the Rutgers Alan M. Voorhees Transportation Center. The event meets requirements for up to 3 professional development hours (PDHs) for continuing professional competency for licensed professional engineers. AICP maintenance credits are available for planners for the keynote speaker and panel session in the morning, and the safety and equity/mobility sessions in the afternoon.



ABOUT OUR PRESENTERS

Randall (Keith) Benjamin II, Associate Administrator for Highway Policy and External Affairs, Federal Highway Administration (FHWA), U.S. Department of Transportation (U.S. DOT)

Mr. Benjamin serves to advance the mission and goals of FHWA while working with all transportation stakeholders, including Members of Congress, State agencies, local communities, and other mobility users. He leads the Office of Policy and Governmental Affairs which is responsible for a variety of critical and diverse topics ranging from managing congressional affairs; housing FHWA's traffic and transportation performance data; collaborating with the international community on new highway technology, transportation research, and program innovations; and, performing studies and analyses of national transportation policy options. As a specialist with a multi-modal transportation background, he brings experience as a transportation professional in government, labor, and advocacy.

Prior to his swearing in on August 30, 2021, he served as the Director of the Department of Traffic and Transportation for the city of Charleston, South Carolina where he refocused the department on equitable mobility and passed the first citywide transportation plan in history. He also represented the city on the CARTA Transit Board, Charleston Aviation Authority, and the Berkeley-Charleston-Dorchester Council of Governments.

Previously, he formed the Federal Transportation Equity Caucus as a member of the policy office under U.S. DOT Secretary Anthony Foxx and was a manager with the Safe Routes to School National Partnership. He also held increasingly senior government affairs roles with the Transport Workers Union of America, AFL-CIO representing 150,000 members across the airline, railroad, and transit sectors after serving multiple members of Congress. He is a graduate and Deans awardee of Swarthmore College and a former fellow of both the American Council of Young Political Leaders (ACYPL) to Kenya and Ethiopia and the National Association of City Transportation Officials Leadership program. Keith is happy to return Washington, D.C. where he lives with his wife and son.

Amanda Gendek, Manager, Bureau of Research, New Jersey Department of Transportation

Amanda earned a B.S. in Environmental Science from Stockton University and spent her early career in the private sector conducting environmental site evaluations and remedial investigations for residential and industrial sites. After leaving the private sector, she spent 14 years acquiring environmental clearances for various transportation projects for the New Jersey Department of Transportation (NJDOT). During this time, she earned her M.S. degree in Environmental Policy from the New Jersey Institute of Technology. Her current role as the Manager of NJDOT's Bureau of Research affords her the opportunity to work with partners and stakeholders at the federal, state, university, and local levels to develop and conduct research that improves safety, operations, and mobility for all road users. She is the designated Transportation Research Board (TRB) state representative as well as a voting member of the AASHTO Research Advisory Committee (RAC). She also serves on the AASHTO RAC Program Management & Quality task force. In addition to managing the Research Bureau's program of activities, she is an Executive Member of the NJ's State Transportation Innovation Council (STIC). In partnership with the

Federal Highway Administration (FHWA), the NJ STIC is responsible for implementing proven, market-ready innovations, such as those in FHWA's Every Day Counts (EDC) program. She participates in several transportation events and conferences throughout the state, speaking about NJ STIC's successful innovative initiatives and promoting STIC efforts. Under Amanda's leadership, the NJ STIC received the 2019 STIC Excellence Award for fostering a strong culture of transportation innovation.

Elkins Green, Director, Environmental Resources, New Jersey Department of Transportation

Elkins Green is a 40 plus year NJDOT employee, who has served for the last 16 years as a member of the Department's Senior Executive Service as Director of the Division of Environmental Resources. His Division ensures that the Department's actions and activities comply with applicable federal and state requirements, and is the central point of contact for environmental policy. He also currently serves as the Department's representative on the Interagency Council for Climate Change Resilience and the Environmental Justice Interagency Council. He holds a Bachelors of Arts degree and Master degree in Urban Planning from Rutgers University, and is a Certified Public Manager. A true team player, Elkins values the importance of team work and building lasting relationships with his coworkers, as well as striving to make a positive difference in the functions of the Department.

David Maruca, Program Development Specialist, Rutgers Center for Advanced Infrastructure and Transportation

David Maruca has been a Program Developer for Rutgers Center for Advance Infrastructure and Transportation (CAIT) since 2013. He is responsible for developing, coordinating and administering several CAIT transportation safety programs. Prior to joining CAIT, he was an enlisted member of the New Jersey State Police where he served in many different capacities including as an Academy Instructor and Unit Head of both Construction and the Motor Coach Compliance Safety Audit Review Unit. He ultimately achieved the rank of Lieutenant before retiring from the Transportation Safety Bureau after 27 years of service. David holds a Master's degree in Education from Seton Hall University.

Veronica Murphy, Director's Office, Division of Local Aid & Economic Development, New Jersey Department of Transportation

Veronica Murphy is an Executive Assistant for Special Projects and subject matter expert for the Local Aid Resource Center at NJDOT, a central source of information for assisting communities with project planning, project delivery, grant application, guidance through the federal process, and other services. She has spent most of her 18 years at NJDOT working in project development and project management. She is a subject matter expert on Community Impact Assessment and Public Involvement, and worked on the development of the study areas community profile and determining an appropriate outreach program for these projects. She was part of a team that was tasked with facilitating the safe passage of pedestrians across a busy highway in Union County, New Jersey. The team successfully implemented a shuttle service for the corridor. She also led the outreach efforts for the Pulaski Skyway rehabilitation project. In 2005, she was the project manager for the Northeast Community Impact Assessment Workshop, which was a collaboration between NJ DOT, the Federal Highway Administration,

and the Transportation Research Board (TRB). At TRB, Veronica chairs the Standing Committee on Community Resources and Impact and serves as a member of the Standing Committee on Public Engagement and Communications.

Krishna Murthy, President, EZ Ride Transportation Management Authority

Krishna Murthy is the President & CEO of EZ Ride. Over the last 30 years, he has overseen the organization's growth from serving the Meadowlands with just three employees to launching statewide programs with 100+ employees, increasing annual revenues from less than half a million to more than \$7 million, and accumulated assets worth about \$10 million. Under his leadership, EZ Ride has evolved from a "transportation broker" to a "transportation provider" that serves about 300 businesses in Northern New Jersey today. EZ Ride's shuttle program operates 24x7, and while it struggles for ridership like other transit systems, it served more than 2,000 riders daily before the pandemic. In the last few years, EZ Ride has launched EZ Ryde4Life – a statewide transportation program with Lyft & Uber for older adults and low-income riders that currently provides about 5,000 rides a month and bicycle and pedestrian programs for kids in more than 300 different schools and municipalities. In 2013, EZ Ride was recognized as the Urban Transportation System of the Year by the Community Transportation Association of America (CTAA) and the Outstanding TMA in 2008 by the Association of Commuter Transportation (ACT). He has a background in planning, engineering, and business. He graduated from Columbia Business School, City University of New York, and Pratt Institute in Brooklyn. Before immigrating to the U.S. in 1989, Krishna graduated from the National Defence Academy and the Indian Military Academy and served as a Captain in the Indian Army.

Byron Nicholas, Supervising Transportation Planner, Hudson County Office of Engineering

Byron Nicholas is Supervising Transportation Planner for Hudson County, NJ where he works to allocate, develop and manage a multi-million dollar portfolio of multimodal federal and state funded transportation projects and studies with a focus on equitable practices and strategies. He also serves as the vice-chair of his regional MPO's Transportation Advisory Committee. Prior to this role, he worked in the Geometric Design unit of New York City Department of Transportation. He is also the Founder of Grid City Planning, LLC. d/b/a Black + Urban, an online publication created as a safe space for African American and underrepresented urban planners, designers and forward thinkers. He has received both his Master's degree in Urban Planning ('13) and Bachelor's degree in Environmental Design ('11) from the University at Buffalo. Byron holds a Professional Planners License for the State of New Jersey (PP) and is a member of the American Institute of Certified Planners (AICP) with over 9+ years of urban planning experience.

Parth Oza, Acting Assistant Commissioner, Capital Program Management and Deputy State Transportation Engineer, New Jersey Department of Transportation

Parth Oza was appointed to the position of Acting Assistant Commissioner, Capital Program Management (CPM) on July 1, 2022. As a key member of the New Jersey Department of Transportation's senior leadership team, he is charged with delivering an annual Capital Program of \$600 million plus in state and federal projects

as well as overseeing a work force of more than 1,300 employees in six Divisions within CPM. He is responsible for leading an active Construction Program valued at \$5 billion with 250 plus active Highway and Bridge construction projects. He serves as a voting member on the AASHTO Highway Subcommittee, and as one of two Deputy State Transportation Engineers of the Department. Prior to his current appointment he was the Assistant Division Director of the Bureau of Operations Support and Engineering where he successfully delivered 50 plus construction projects valued at \$300 million plus annually. In 2012, he received a Bachelor of Science (BS), Civil Engineering degree from Rutgers University and a Master of Business and Science (MBS), Engineering Management from Rutgers University in 2021. Parth is a registered Professional Engineer (PE) in the State of New Jersey.

Valeriya Remezova, Deputy Division Administrator, Federal Highway Administration, New Jersey Division Office

Dr. Valeriya Remezova began her FHWA career in 2005 as an Area Engineer in the New York Division. For the past 13 years, she took on various leadership roles in the Division as the Senior Operations Engineer, Local Programs Manager and Planning & Environment Team Leader. In these positions, she led multi-disciplinary teams of outstanding professionals working in planning, environment, design, construction, preventive maintenance and local projects' programs. In November 2017, she joined New Jersey Division as the Deputy Division Administrator. In this role, she manages a high performing Division Team, assists the New Jersey Division Administrator in stewardship and oversight of over \$1 billion annual New Jersey State Department of Transportation Federal Aid program. Her accomplishments and leadership have been recognized by the USDOT Secretary for EEO, FHWA Executive Director for Diversity Management, and the NJ Division Administrator for Outstanding Performance awards, and featured in the Spring 2020 edition of Public Roads focused on female leaders in transportation. Prior to FHWA, she worked as the Design-Build Engineer-in-Charge at the New York City Department of Transportation where she led a successful delivery of the first in New York City \$70 million Design-Build project, implemented FHWA East River Bridges Preventive Maintenance Program, and contributed extraordinary efforts in the aftermath of the September 11, 2001 terrorist attack. Valeriya has over 36 years of civil engineering experiences; B.S., M.S., and PhD in Civil Engineering from Odessa Institute of Civil Engineering, Ukraine.

Michael Russo, Assistant Commissioner, Planning, Multimodal and Grant Administration, New Jersey Department of Transportation

Michael Russo was appointed to the position of Assistant Commissioner in August 2017. He is responsible for managing the Divisions of Statewide Planning, Multimodal Services, Local Aid and Economic Development, and Environmental Resources. Prior to becoming Assistant Commissioner, he served as the Director of Local Aid and Economic Development leading a team of professional and administrative staff in five Local Aid offices responsible for the Department's \$530 million Local Aid program. Earlier in his career, he served in various capacities including Project Engineer of a Roadway Design Squad, District Engineer of the Freehold Local Aid Office, and Manager of the Bureau of Design Coordination and Geometric Design. He also served in the Division of Project Planning and Development managing Concept Development and Feasibility Assessment efforts on projects throughout the state including the

I-295/Route 42/I-76 Direct Connection Project. Michael received a Bachelor of Science degree in Civil Engineering from the University of Miami.

Andrew Tunnard, Assistant Commissioner, Transportation Operations, Systems and Support, New Jersey Department of Transportation

Andrew Tunnard joined NJDOT in July 2011 where he served as the Executive Director, Operations before his promotion to Assistant Commissioner, Operations in April 2014. He is a retired Navy Commander where he served for more than 22 years in both active duty and reserve duty assignments. During his military career

he was involved in Operation Desert Storm; Operation Restore Hope (Somalia); Operation Enduring Freedom and the Haitian earthquake relief efforts. He also has more than 13 years of private sector managerial experience where his responsibilities included running operations domestically and internationally. As Assistant Commissioner of Transportation Operations Systems and Support, he is responsible for more than 1,600 personnel and more than 25,000 pieces of equipment to maintain NJDOT's transportation infrastructure. Andrew received his Bachelor of Arts degree in History from the Virginia Military Institute and his Masters in Business Administration from Marywood University.



24TH ANNUAL NJDOT RESEARCH SHOWCASE PARTNERS

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Please visit the NJDOT Technology Transfer website
and the New Jersey State Transportation
Innovation Council page:

<https://www.njdottechtransfer.net/>

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* To confirm the acceptance of these PDHs for continuing professional competency for licensed professional engineers, please consult the licensure board of that state.