UNIVERSITY TRANSPORTATION RESEARCH CENTER
and NEW YORK INSTITUTE OF TECHNOLOGY Present:

2019 Transport-Tech Summit

TRANSPORTATION TECHNOLOGY SYMPOSIUM:
INNOVATIVE MOBILITY SOLUTIONS

FRIDAY, NOVEMBER 1, 2019
8:00 AM - 5:00 PM

NYIT AUDITORIUM ON BROADWAY,
1871 BROADWAY, NEW YORK, NY 10023

CONFERENCE PARTNERS

WiFi: NYIT-Guest Password: CobaltBlue

UTC

THALES

WINDELS MARX Windels Marx Lane & Mittendorf, LLP

NEW YORK INSTITUTE OF TECHNOLOGY

ITS-NY Intelligent Transportation Society of New York

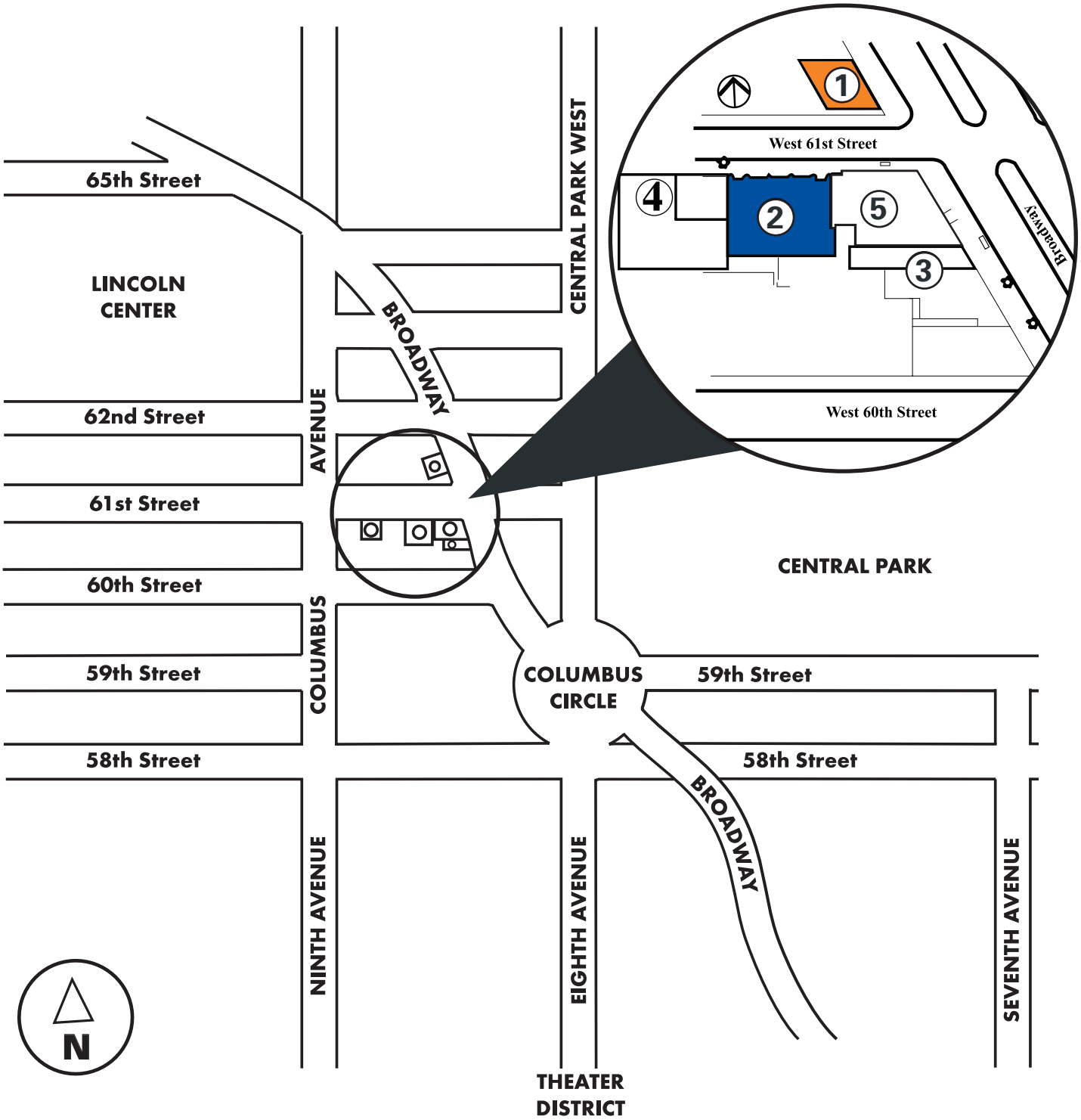
SMART DRIVING CARS

NEW YORK INSTITUTE OF TECHNOLOGY

Manhattan Campus Map

Auditorium 1 — ① **NYIT Auditorium on Broadway**
1871 Broadway

Auditorium 2 (11th Floor) — ② **New Technology Building**
16W. 61st St.



PROGRAM OVERVIEW

8:00am - 9:00am Auditorium 1

Breakfast & Registration

9:00am– 9:20am Auditorium 1

Welcoming Remarks

9:20am – 9:45am Auditorium 1

Introductory Remarks:

Honorable Diana Furchtgott-Roth,
Deputy Assistant Secretary for Research and Technology (OST-R), USDOT

9:45am – 11:15am Auditorium 1

Plenary Session 1

Technology and the Future of Mobility – Above & Below Ground!

11:15am –-11:30am Auditorium 1

Coffee Break

11:30am– 12:45pm Auditorium 1

Breakout Session 2

Connected and Automated Vehicles - How to Make it Happen

11:30am– 12:45pm Auditorium 2

Breakout Session 3

Transportation Data Modeling, Analysis & Applications

12:45pm – 1:45pm Auditorium 2

Luncheon

1:45pm –- 3:00pm Auditorium 1

Breakout Session 4

Transportation Technology for Traffic & Mobility Management

1:45pm –- 3:00pm Auditorium 2

Breakout Session 5

Transportation Technology and Data to Achieve Desired Outcomes: Equity, Accessibility, and Sustainability

3:00pm – 3:15pm Auditorium 1

Break

3:15pm – 3:45pm Auditorium 1

Keynote Speaker:

Hon. Ydanis Rodriguez, NYC Council member

3:45pm – 5:00pm Auditorium 1

Plenary Session 6

Meeting the Challenges of Mobility

5:00pm – 5:10pm Auditorium 1

Closing Remarks

CONFERENCE PARTNERS

Program Details

8:00am - 9:00am
Auditorium 1

Breakfast & Registration

9:00am - 9:20am
Auditorium 1

Welcoming and Introductory Remarks

Dr. Babak D. Beheshti, Dean, College of Engineering and Computing Sciences, NYIT
Dr. Camille Kamga, Director, UTRC
Matthew W. Daus, Transportation Technology Chair, City University of New York, CCNY/UTRC

9:20am - 9:45am
Auditorium 1

Introductory Remarks

Honorable Diana Furchtgott-Roth, Deputy Assistant Secretary for Research and Technology (OST-R), USDOT

9:45am - 11:15am
Auditorium 1

Plenary Session 1

Technology and the Future of Mobility – Above & Below Ground!

Moderator:

Matthew W. Daus, Transportation Technology Chair, City University of New York, CCNY/UTRC

Presenters:

Duncan Lewis
Thales Transport & Security, Inc
Modernizing the Subway System

Dr. Mohamad Talas
New York City Department of Transportation (NYCDOT)
New York City Connected Vehicles Pilot Demo

Alison Pascale
Audi
Perspectives from Audi on the Future of Mobility

11:15am - 11:30am
Auditorium 1

Break / Poster Exhibition *Posters will be displayed from 9:00 am to 4:00 pm in the Auditorium 1 Foyer*

Carrie Conton, Prairie View A&M University (PVAMU)
Eco-driving Strategy for Connected Autonomous Vehicles Encountering Truckplatoons Merging on the Highway

Robert DeDomenico, CargoFish
A Comparative Energy and Economic Analysis of Last Mile Distribution Modes

Robert L. Gordon and Charles Ardilio, ALMAGuide, LLC
Bringing Dynamic Message Sign Information Into Vehicles

Mina Lee, Graduate Student; Joseph Y. J. Chow (NYU)
Forecasting E-scooter Competition with Direct and Access Trips by Mode and Distance in NYC

Anil Mujumdar, Visiting Lecturer, School of Law, The University of Alabama
Transportation Safety Technology Initiatives Focusing on Defensive and Universal Design

Srushti Rath and Joseph Y.J. Chow, New York University
Air Taxi Skyport Location Problem for Airport Access

Patricio Vicuna, Dr. Camille Kamga, Dr. Kyriacos Mouskos, and Dr. Sandeep Mudigonda
Transit Network Design Problem (Transit-ND) - Impact on Network Travel Time Using a Transportation Planning Model (TPM) Using a Transportation PlanningModel (TPM)

11:30am – 12:45pm
Auditorium 1

Breakout Session 2

Connected and Automated Vehicles- How to Make it Happen

Moderator:

Dr. Camille Kamga
UTRC

Presenters:

Dr. James Cohen
CUNY
Innovative Mobility Technology in Historical Context

Dr. Ondrej Pribyl
Czech Technical University
Effects of Connected and Automated Vehicles in a Cooperative Environment

Anil Mujumdar
University of Alabama
Unintended Consequences of Autonomous Vehicles: Facilitation of Human Trafficking

Dr. Quanyan Zhu
New York University
A High-Capacity Low-Waiting Time Intersection Management System for Connected and Autonomous Vehicles

11:30am - 12:45pm
Auditorium 2

Breakout Session 3

Transportation Data Modeling, Analysis & Applications

Moderator:

Dr. Hongmian Gong
Hunter College, City University of New York

Presenters:

Pam Cruz
Streetlight Data
Multimodal Planning and Travel Demand Management with Big Data

Saeed Vasebi, and **Dr. Yeganeh M. Hayeri**
Stevens Institute of Technology
Investigating Taxi and Uber Competition in New York City: Multi-agent modeling by reinforcement-learning

Dr. Catherine T. Lawson
University at Albany, SUNY
State-of-the-Art Web-Based Congestion, Reliability and Incident analysis

Drs. Stanley Young and Joshua Sperling
National Renewable Energy Laboratory and
Dr. Camille Kamga and Dr. Sandeep Mudigonda
The City College of New York
Exploring Long term of ACES and Employer Providing Mobility

Leo Tsang
Port Authority of NY/NJ
If Automated Vehicles (AV) become ubiquitous in New York New Jersey Region in 2040…

12:45pm – 1:45pm
Auditorium 2 Foyer

Luncheon

1:45pm – 3:00pm
Auditorium 1

Breakout Session 4

Transportation Technology for Traffic & Mobility Management

Moderator:

Dr. Mahdieh Allaviranloo
UTRC/CCNY

Presenters:

Dr. Michael Shenoda
Farmingdale State College
Evaluation of LIRR At-Grade Intersections for Implementation of Adaptive Traffic Signal Control

Dr. Scott Levine
SUNY Platz
Optimal Allocation of Curbside Space

Adam S. Levine
New York State Department of Transportation
Irene Sadko, P.E., LEED AP BD&C, Manager Regional Program Coordination, Engineering and Construction, MTA Bridges and Tunnels
Moving Beyond Work Zones: Maintaining Mobility Across New York City Agency Boundaries

Dr. Jerome Lutin
NJ TRANSIT (Retired)
How We Are Testing an Automated Collision Avoidance and Emergency Braking System for Buses and What We Have Learned So Far

1:45pm - 3:00pm
Auditorium 2

Breakout Session 5

Transportation Technology and Data to Achieve Desired Outcomes: Equity, Accessibility, and Sustainability

Moderator:

Dr. Alison Conway,
UTRC/CCNY

Presenters:

Ashley Berg
RedRoute
Innovative Call Center Automation to Improve the Customer Experience

Denisolt Shakhbulatov, Arshit Arora, Dr. Ziqian (Cecilia) Dong
New York Institute of Technology,
Dr. Roberto Rojas-Cessa
New Jersey Institute of Technology
Blockchain Implementation for Analysis of Carbon Footprint across Food Supply Chain

Paul Rivers, Dr. Hongmian Gong, and **Dr. William Solecki**
Hunter College, CUNY
A Smartphone App Survey to Encourage Sustainable and Healthy Travel Mode Choices

Dr. Ricardo Daziano
Cornell University
Encouraging EV Use: An Analysis of Survey Data about EV Uptake in Tompkins County and in Upstate New York.

Nick Bhashyam and James Dorman
Athena Insights
Finally TNC Data

3:00pm - 3:15pm
Auditorium 1

Break

3:15pm - 3:45pm
Auditorium 1

Keynote Speaker

Hon. Ydanis Rodriguez
New York City Council Member

3:45pm - 5:00pm
Auditorium 1

Plenary Session 6

Meeting the Challenges of Mobility

Moderator:

Dr. Robert E. Paaswell
UTRC/CCNY

Presenters:

Dr. John C. (Giancarlo) Falcocchio
New York University
Expanding Micro Mobility in the Manhattan CBD Requires Taking Road Space from Private Cars

Matthew Rosenbloom-Jones
Union Internationale des Transports Publics
What MaaS Means for Fixed Route Transit and Communities.

Gerry Bogacz
New York Metropolitan Transportation Council
Developing A Regional Planning Vision for Shared Mobility

Dr. Rae Zimmerman
New York University
Challenges of Multimodal Networks Interconnecting Transportation Technologies: CAV and other Mode Innovations

5:00pm - 5:10pm
Auditorium 2 Foyer

Closing Remarks

Introductory Remarks

Honorable Diana Furchtgott-Roth

Deputy Assistant Secretary for Research and Technology (OST-R), USDOT

Diana Furchtgott-Roth is the Deputy Assistant Secretary for Research and Technology (OST-R). She seeks to ensure that research, development and technology activities and budgets across the Department are fully aligned with the Department's strategic goals and key areas of interest, and that Departmental statistics are reliable and of the highest quality. Ms. Furchtgott-Roth focuses on the deployment of innovation in America's transportation system, with the goal of lowering barriers in the development of new technology.

Prior to joining DOT, she was Acting Assistant Secretary for Economic Policy at the U.S. Department of Treasury. She has been a senior fellow and director of Economics21 at the Manhattan Institute for Policy Research and an adjunct professor of economics at The George Washington University. She previously served as Chief Economist of the U.S. Department of Labor; Chief of Staff of the President's Council of Economic Advisers; Deputy Executive Director of the Domestic Policy Council; and Junior Staff Economist at the Council of Economic Advisers. Ms. Furchtgott-Roth is the author of five books and was a columnist for MarketWatch.com and Tax Notes. She received her BA in economics from Swarthmore College and her M.Phil. in economics from Oxford University.

Keynote Speaker

Honorable Ydanis Rodriguez

NYC District 10 Council Member

Council Member Ydanis Rodriguez, represents the 10th Council District, which includes the neighborhoods of Washington Heights, Inwood and Marble Hill. There is literally no other greater champion for our community, our voice. These neighborhoods, filled with hardworking residents, continuously strive to maintain a robust and authentic identity of a multicultural, working class community.

However, the city's aggressive transformation has inadvertently imperiled the district's position as an ethnic enclave of working class people filled with immigrants. It is, ergo, imperative that District 10 synchronizes their wealth of opportunities and growth potential into actionable plans. Ydanis recognizes this unique, and yet, powerful position of the district. He wholeheartedly believes and knows the district can seize the future by pioneering the cultivation of a technological and health hub. He envisions District 10 developing into a conglomeration of advancement, diversity, and empowered community through private-public partnerships infused with mixed use of resources. Given Council Member Rodriguez's recent accomplishments – both city and municipal wide – we can confidently trust and know District 10 is, indeed, bound to actualizing this reality.

District 10 would not be the way it is without its main visionary crusader and incomparable public servant: Ydanis Rodriguez.

Welcoming Remarks

Dr. Babak D. Beheshti

Dean, College of Engineering and Computing Sciences, New York Institute of Technology
NYIT

Babak D. Beheshti is professor and Dean of College of Engineering and Computing Sciences at New York Institute of Technology (NYIT). College of Engineering and Computing Sciences (CoECS) has over 50 full time faculty, and approximately 3000 students, pursuing undergraduate and graduate programs in two New York based campuses, as well as in Vancouver, BC. Babak has been a full time faculty member at NYIT for over 30 years.

Babak's areas of research include secure embedded systems, wireless sensor networks, and wireless systems. He is author of numerous technical papers in these areas. Babak is a recipient of the IEEE, MGA Leadership Award, IEEE Millennium Medal, the IEEE Long Island Section Athanasios Papoulis Outstanding Educator Award (given for noteworthy contributions to engineering education), and three IEEE Region 1 Awards, including 2008 IEEE Northeastern Region Technical Innovation Award "For Providing Technical Leadership in the Development of State-of-the Art Reconfigurable Wireless Technologies."

He has over 20 years of experience in R&D for embedded systems and wireless technology industry, where he has successfully managed joint R&D programs with Asian, European, and U.S. companies including Siemens Mobile, Nokia, Samsung, KDDI, and LG.

Dr. Camille Kamga

BREAKOUT SESSION 2
MODERATOR,

University Transportation Research Center
UTRC

Camille Kamga is Director for the University Transportation Research Center (UTRC) and an Associate Professor of Civil Engineering at The City College of New York. As a consortium of 18 major U.S. academic institutions, UTRC asserts a significant role in the Federal Region 2 and nationally, conducting research and projects on surface transportation, carrying out training and educational programs and actively disseminating the results of its work.

It is one of the few such Centers in the U.S. federally designated since 1987. Dr, Kamga is a member of the TRB's Urban Transportation Data and Information Systems Committee (ABJ30). He serves in the Board of Director of the Intelligent Transportation Society of NY – a professional group providing education and outreach to foster the understanding of ITS applications and technologies.

He is also a member of Education and Research Committee of the International Association of Transportation Regulators. He holds a Ph.D. in Civil Engineering from the Graduate Center of the City University of New York, specializing in Intelligent Transportation Systems (ITS). He is the 2006 recipient of the National Pikarsky Award for Outstanding Dissertation in Science and Technology from the Council of UTC.

Matthew W. Daus

PLENARY SESSION 1
MODERATOR

Transportation Technology Chair, City University of New York, CCNY/UTRC

Matthew W. Daus, Esq. currently serves as Transportation Technology Chair at the City University of New York's (CUNY) Transportation Research Center of The City College of New York, where he conducts research, and continues to be extensively published as an expert on ground transportation regulation and technology. As a CUNY Distinguished Lecturer for the past 9 years, he taught courses on transportation history, policy, sustainability, for-hire regulation and technology. Mr. Daus also continues to serve for the past 10 years as President of the International Association of Transportation Regulators (IATR), a non-profit educational and advocacy peer group of government transportation regulators from around the world promoting best regulatory and innovative practice.

Commissioner Daus is the longest serving Chairman of the New York City Taxi and Limousine Commission (TLC), serving for 8 ½ years. Prior to his tenure as Commissioner, Mr. Daus served in executive and other positions in NYC government for almost 20 years at several agencies including as General Counsel to the TLC and the NYC Community Development Agency, as Special Counsel to the TLC and NYC Trade Waste Commission, as a NYC Human Rights Prosecutor, and as Commissioner of the NYC Civil Service Commission. Mr. Daus is a partner and currently chairs the Transportation Practice Group at Windels Marx Lane & Mittendorf, LLP.

Plenary Session 1

Moderator

Matthew W. Daus,
Transportation Technology Chair, City University of New York, CCNY/UTRC

Presenters:

Duncan Lewis
Thales Transport & Security, Inc

Duncan Lewis is the CEO and General Manager for Thales' ground transportation business in the United States. With more than 30 years of industry experience, Mr. Lewis encourages innovative techniques and processes to evolve the transportation business and drive growth initiatives in the U.S.

Mr. Lewis is also responsible for ensuring the success of major transportation agency projects with customers including the Port Authority of New York and New Jersey, the Metropolitan Transportation Authority, and the San Francisco Municipal Transportation Agency.

Mr. Lewis previously served as Vice President, Bids & Projects and Vice President, Operations for the U.S. transportation business of Thales. He also held senior management positions with Alcatel Transportation in the U.S. prior its acquisition by Thales, as well as management positions with an engineering software technology startup.

He was part of the product team that developed some of the early advanced train control systems for Thales, and for nearly three decades Thales has been pioneering innovations in rail signaling technologies that now operate in more than 20 cities around the globe.

He holds a Bachelor of Science in Electrical Engineering with Honors specializing in computers from Queen's University in Ontario, Canada.

Dr. Mohamad Talas
New York City Department of Transportation (NYCDOT)

Dr. Mohamad Talas bring long standing career experience in traffic engineering and continue with over 27 years in Traffic Engineering and Operation experience in New York City Department of Transportation. He currently serves as the Director for the NYC Department of Transportation ITS project Management, Research and Development where he supervises the Intelligent Transportation System projects and initiatives in New York City. These projects include the development and implementation of the New York City Traffic Computerization System at the Traffic Management Center modernizing and operating over 12,000 signals and the currently deployed Active Traffic Management System in in Manhattan(Midtown In Motion) and NYC Connected Vehicle Pilot Deployment.

He has earned PHD in Transportation Planning and Engineering at NY-Poly University, Master degrees in Transportation, Planning and Engineering and master in Electrical Engineering from Fairleigh Dickinson University. He is a licensed Professional Engineer and a member in the Intelligent Transportation Systems America organizations and ITE and a member of Intelligent Transportation Systems Advance Transportation Controller National Standards

Alison Pascale
Audi of America

Pascale has over 25 years of combined legislative and executive branch experience developing and implementing public policy with a focus on automotive safety, manufacturing, transportation policy and international trade. At Audi, Pascale works to advance federal and state policies that will accelerate the safe deployment of automated vehicle technologies. She engages and informs elected officials on vehicle technologies, develops and advises on public policy and legislative initiatives, builds and expands stakeholder coalitions, and initiates innovative approaches to prioritize vehicle safety.

Prior to coming to Audi, Pascale was Director of Governmental Affairs, Policy and Strategic Planning at the National Highway Traffic Safety Administration (NHTSA). In her senior leadership position at NHTSA, Pascale developed and implemented initiatives to reform the agency; played a key role in developing agency guidance on highly automated vehicles; and implemented changes to improve NHTSA's defects and recall mission. Pascale also oversaw all aspects of NHTSA's interactions with Congress.

Pascale previously was a senior advisor to Senator Carl Levin from Michigan, worked in the House of Representatives and at the Government Accountability Office and was a Presidential Management Fellow. She holds undergraduate and graduate degrees from American University in International Studies and International Relations.

She lives in Arlington, Virginia, with her husband and two children. When not at the office she can be found on the tennis court, traveling with her family or on a lake in Maine.

Breakout Session 2

Moderator

Dr. Camille Kamga
University Transportation Research Center

Presenters:

Dr. James Cohen
City University of New York

Jim Cohen, Ph.D. is Professor Emeritus at the City University of New York (CUNY) and Associate Director of Research at CUNY's Institute for Transportation Systems. Cohen's recent research concerns the history of high speed technology, including high speed trains and alternative ground transport such as Personal Rapid Transit, Air Cushion Vehicles, and hyperloop systems. He has written about the origins of high-speed technology; transnational exchanges of technology between the U.S., France, Britain, and Japan; and relationships between science, industry, and government in the development of high speed technology. Prior to this recent work, Cohen's research focused on the financial, economic, and political history of passenger railways in the U.S., Europe, and Asia. His publications appear in journals, such as Enterprise and Society, Journal of Transport History, Research in Transportation Business and Management, Urban Affairs Quarterly; and Histoire des chemins de fer de France; as well as in edited volumes published in the U.S. and France. He serves on the Editorial Board of the Journal of Urban Technology, and is active in professional associations such as T2M, Society for the History of Technology, and the Business History Association.

Dr. Ondrej Pribyl
Czech Technical University

Prof. Ing. Ondrej Pribyl, PhD., vice dean for international relations and the head of Department of applied mathematics at the Faculty of Transportation Sciences at the Faculty of Transportation Sciences at the Czech Technical University in Prague (CTU). He got his Master degree at CTU, Faculty of Electrical Engineering in the area of technical cybernetics and artificial intelligence. He graduated at Penn State University in the USA in the field of transportation planning. Since 2003 he has been working at the Faculty of Transportation Sciences (CTU), Department of Applied Mathematics. He became full professor in the year 2017 and in the year 2019 the head of the department.

His professional interest is in diverse fields, among others system theory, intelligent transportation systems, smart cities, mathematical modelling, data collection and analysis, or artificial intelligence. Lately, the application field of the most interest is Traffic control and management or Automated vehicles, where he aims at using not only of common control methods but also methods from the field of artificial intelligence such as multi-agent systems.
He has been a member of several professional organizations, such as Transportation Research Board. Young Member of the Committee on Travel Behavior and Values, A1C04 (TRB, the National Academy of Sciences, USA); Member of Penn State ITS America Student Chapter; Young Member of the Committee on Travel Behavior and Values, A1C04 (TRB, the National Academy of Sciences, USA) or Gestor for standardization committee CEN/TC 278 Working Group 5 - Detection on Motorways for Traffic Information and Traffic Management Applications.

He participated on various national as well as international research projects, such as project H2020 - MG-3.6a-2015 MAVEN (Managing Automated Vehicles Enhances Network) (2016-2019); project TACR SIRID (Development of a new generation of a highway management system (2012-2015) or project EU- ATLANTIS (2010-2015) enhancing cooperation between US and EU universities.

Breakout Session 2 (continues)

Presenters:

Anil Mujumdar
University of Alabama

Anil Mujumdar, is a Visiting Lecturer in Law at The University of Alabama School of Law and practices law as Of Counsel at Zarzar in Birmingham, Alabama. Professor Mujumdar has worked as a litigator throughout his career and has consistently represented people with disabilities in a variety of plaintiff's cases. Among other matters, he currently serves as counsel in a prison conditions lawsuit brought to improve accessibility and mental health care for people with disabilities in the Alabama prison system. He also serves as one of twelve members of the ACLU's national Executive Committee, serves on the ACLU's national Board of Directors and is past-President of the ACLU of Alabama. Professor Mujumdar received his BA n English from Birmingham-Southern College, where he ran varsity cross-country and served as SGA President; a Master of Arts in American Studies from the University of Alabama; and a JD from the University of Alabama School of Law.

Dr. Quanyan Zhu
New York University

Quanyan Zhu is an assistant professor in the Department of Electrical and Computer Engineering at New York University. He received the B. Eng. in Honors Electrical Engineering with distinction from McGill University in 2006, the M.A.Sc. from University of Toronto in 2008, and the Ph.D. from the University of Illinois at Urbana-Champaign (UIUC) in 2013. From 2013-2014, he was a postdoctoral research associate at the Department of Electrical Engineering, Princeton University. He is a recipient of many awards including NSERC Canada Graduate Scholarship (CGS), Mavis Future Faculty Fellowships, and NSERC Postdoctoral Fellowship (PDF). He spearheaded and chaired INFOCOM Workshop on Communications and Control on Smart Energy Systems (CCSES), Midwest Workshop on Control and Game Theory (WCGT), and 7th Game and Decision Theory for Cyber Security (GameSec). His current research interests include resilient and secure interdependent critical infrastructures, energy systems, cyber-physical systems, and smart cities.

Breakout Session 3

Moderator

Dr. Hongmian Gong
Hunter College, CUNY

Hongmian Gong is a Professor of Geography at Hunter College and Professor of Earth and Environmental Sciences at the Graduate Center of the City University of New York. She has done substantial research on using GPS, mobile technologies, Web GIS, and cloud computing for urban transportation studies. Dr. Gong also serves as a member of the Board of Directors in UTRC. She established a re¬search cluster team on GPS for Transportation at UTRC2 (http://www.geography. hunter.cuny. edu/~hgong/GPS/ClusterTeam.html) and organized a GPS for Transportation Symposium in New York City (program and presentation videos available at
http://www.geo.hunter.cuny. edu/~h-gong/GPS/Symposium.htm).

Speakers

Breakout Session 3 (continues)

Presenters:

Pam Cruz
Streetlight Data

Pam Cruz has nearly 13 years of experience providing technology and data solutions across a range of engineering disciplines, including transportation and construction. She currently serves as the Northeastern Region Territory Manager at StreetLight Data, a transportation-focused SaaS analytics provider of Big Data that serves public agencies and engineering firms across the US & Canada. At StreetLight, Pam partners with engineering and consulting firms, helping them leverage locational mobile device data to diagnose complex transportation challenges and identify high-potential solutions. Prior to joining StreetLight, Pam was a Strategic Account Manager at Dodge Data and Analytics where she helped clients utilize data to grow their business.

Saeed Vasebi
Stevens Institute of Technology

Saeed Vasebi, He is a Ph.D. candidate at the School of Systems and Enterprises in Stevens Institute of Technology. He accomplished his undergrad and master programs in Industrial Engineering at Amirkabir University. He has started his PhD in Systems Engineering program in 2016. He published several research papers in the energy-emission impacts of automated vehicles and drivers' car-following behavior during his PhD. He has received the Best Student Research Paper award at Stevens and Innovation and Entrepreneurship fellowship in 2018. His research interests are socio-economic impacts of new technologies in transportation, deep-learning in transportation, and human behavior in driving.

Dr. Yeganeh Hayeri
Stevens Institute of Technology

Dr. Yeganeh Hayeri is a faculty of the School of Systems and Enterprises at Stevens Institute of Technology. She has a dual Ph.D. from Carnegie Mellon University's departments of "Engineering and Public Policy" and "Civil and Environmental Engineering". Dr. Hayeri received her Master's degree from UC-Berkeley. Prior to her doctoral work, she worked as a transportation engineer in the State of California for over a decade. She has served as an appointed member of the National Academy of Sciences' Transportation Research Board's "Vehicle Highway Automation" Committee since 2013. As a subject matter expert, she sits on highly technical reviewing panels including the National Cooperative Highway Research Program. Dr. Hayeri's research interests include connectivity and automation, human factors and behaviors, socio-technical systems, as well as risk analysis and resiliency within the transportation domain. She has recently been elected and invited by the National Academies of Engineers to attend the 2019 US Frontiers Symposium and by the Royal Academy of Engineers in UK to attend the Global Grand Challenges – 2019 Summit.

Dr. Catherine Lawson
Associate Professor, University at Albany,
Albany Visualization and Informatics Lab (AVAIL)

Dr. Lawson is an Associate Professor in the Geography and Planning Department at the University at Albany and the Director of AVAIL, a "new generation" research lab, specializing in advanced data-driven visualization and informatics. Her research interests include data science applications for transportation research and planning for freight, transit (including ferries) and passenger travel.

Speakers

Breakout Session 3 (continues)

Presenters:

Dr. Stanley Young
National Renewable Energy Laboratory

Dr. Stanley Young, an advanced transportation and urban scientist, joined NREL's Transportation and Hydrogen System Center in 2015. He manages the lab's research efforts on the impacts of new mobility systems, particularly in urban areas. He also serves as the U.S. Department of Energy (DOE) technologist-in-city for the Columbus Smart City program.

Young also leads the Urban Science pillar in DOE's Systems and Modeling for Accelerated Research in Transportation (a.k.a. SMART) Mobility research initiative. As pillar lead, he initiated the development of the Automated Mobility District toolkit to assess the mobility and energy impacts of automated electric shuttles and other district-scale automated mobility systems. He also led the development of the Mobility Energy Productivity metric, which has become the central metric through which DOE's Energy Efficient Mobility Systems program is assessed.

From 2006 to 2015, while on staff at the University of Maryland's Center for Advanced Transportation Technology, he architected a multi-state traffic monitoring system based on vehicles self-reporting their position and speed. The system, known as the I-95 Vehicle Probe Project, is the largest multi-state traffic monitoring system in the country. He also co-developed and patented a Bluetooth re-identification traffic sensor to directly sample vehicle travel times and co-founded Traffax Inc. to accelerate the commercialization of the technology.

Dr. Sandeep Mudigonda
Post-doctoral Research Associate, University Transportation Research Center
The City College of New York, CUNY

Dr. Sandeep Mudigonda is a Post-doctoral Research Associate at the University Transportation Research Center (UTRC), Region II at the City University of New York. His current research interests lie in connected vehicle applications and analysis via simulation, statistical analysis and visualization of transportation data, simulation and calibration of large traffic simulation models and their applications. Dr. Mudigonda has performed research sponsored by several state and national agencies. Prior to his appointment at UTRC, he worked as a post-doc at the Center for Urban Science and Progress (CUSP) at New York University (NYU). Dr. Mudigonda received Ph.D. and MS Degrees in Civil & Environmental Engineering from Rutgers University and BS from Indian Institute of Technology, Madras, Chennai, India.

Leo Tsang
Port Authority of NY/NJ

Leo Tsang is a Principal Transportation Planner/Modeler in the Department of Planning and Regional Development at the Port Authority of New York and New Jersey (PANYNJ). He has over twenty (20) years of extensive American and international experience in the field of transportation modelling, planning, and engineering. His expertise and specialities focus on application of travel demand modelling and multi-resolution modelling for complex and complicated transportation planning projects.

Prior to joining the PANYNJ, he worked for Parsons Brinckerhoff (currently known as WSP) in both the Asia Headquarter in Hong Kong and the American Headquarter in New York.

Breakout Session 4

Moderator

Dr. Mahdieh Allahviranloo
City College of New York , CUNY

Mahdieh Allahviranloo is Assistant Professor at the Department of Civil Engineering, The City College of New York. Her research interests are travel demand and behavior, learning and mining travel patterns, urban operations research, network modeling, and Bayesian econometrics. She is currently working on mining and clustering activity pattern trajectories, data visualization and network modeling under extreme modeling.

Presenters:

Dr. Michael Shenoda
Farmingdale State College

Michael Shenoda is currently an assistant professor in the Department of Architecture and Construction Management at Farmingdale State College in New York. He has previously served as a faculty member at other institutions, totaling over 10 years in civil and construction engineering education. Michael is a member of several professional organizations, including American Society of Civil Engineers (ASCE), Institute of Transportation Engineers (ITE), and American Society of Engineering Education (ASEE). He has also been inducted into Tau Beta Pi, the National Engineering Honor Society, and Chi Epsilon, the Civil Engineering National Honor Society. He has carried out research in several areas, including advanced traffic signal control, construction management, and sustainability in construction and civil engineering. Michael has also worked in the engineering industry for several years, as both a design engineer and construction inspector. He is a licensed professional engineer in New Jersey and Texas, and a LEED (Leadership in Energy and Environmental Design) Accredited Professional in Building Design and Construction.

Adam S. Levine
New York State Department of Transportation

Adam S. Levine, P.E., AICP is the Director of Traffic Safety and Mobility for the New York City region of the New York State Department of Transportation (NYSDOT). In this capacity, Adam and his team work to improve safety and reduce congestion on the city's highways. He has served with NYSDOT for 29 years, with previous positions in the Hudson Valley and Long Island regions. Adam has diverse experience in traffic operations, highway design, major projects, and public and governmental affairs. Recent prior positions include director of the Traffic Safety and Mobility office in the Hudson Valley, manager of the Hudson Valley Transportation Management Center and public information officer for the New York City office. Prior to his time as PIO, Adam served on the Route 9A Project team that rebuilt West Street adjacent to the World Trade Center following September 11, 2001. Adam holds a Bachelor's degree in civil engineering from Princeton University and a Master's degree in transportation planning and engineering from the NYU Tandon School of Engineering.

Irene Sadko P.E., LEED AP BD&C, Manager Regional Program Coordination, Engineering and Construction, MTA Bridges and Tunnels,

Irene Sadko, P.E., LEED AP BD+C, is the Manager for Regional Program Coordination for Engineering & Construction at MTA Bridges & Tunnels, acting as B&T/E&C's primary liaison to a multitude of local, state and federal agencies. She helps to ensure that complex projects, including major planning and feasibility studies, requiring extensive coordination, environmental reviews and real estate agreements are advanced to meet master planning and strategic initiatives in a timely manner. Irene also oversees the Civil and Traffic groups in E&C. Prior to this position, Irene was the Chief Engineer at the NYC Department of City Planning (DCP) and the Deputy Director of the Technical Review Division. She has worked for over 37 years in civil engineering and land-use planning, in all aspects of design and project management. Prior to DCP, Irene worked for 9 years in highway design at Vollmer Associates, a.k.a. Stantec, on a variety of highway projects including the Nassau Expressway, Route 9A, rehab of the BQE and Van Wyck Expressway. She also designed concrete and steel building structures for the structural design firm of Skilling, Helle, Christiansen and Robertson for two years. Irene has a Bachelor and Master Degree in Civil Engineering from CCNY and Certificate in Sustainable Design, Construction and Development from NYU

Breakout Session 4 (continues)

Presenters:

Dr. Scott Levine
SUNY Platz

Dr. Scott Le Vine is an Assistant Professor at SUNY New Paltz and a Senior Transportation Planner with the Transpo Group. His specialty areas of research and practice are mobility services and emerging transportation technologies. He has published widely in internationally leading peer-reviewed journals, and serves on the Public Transportation Innovations Standing Committee of the Transportation Research Board. He is a trustee of Collaborative Mobility UK (CoMoUK), the UK's shared-mobility trade body, and a Visiting Professor at Southwest Jiaotong University in China. He is trained as an Urban Planner and licensed in New Jersey to practice as a Professional Planner.

Dr. Jerome Lutin
NJ TRANSIT (Retired)

Dr. Jerome M. Lutin is actively engaged in automated vehicle research and has written and lectured extensively on implications for the transit industry. He is currently serving as Principal Investigator for a federally-funded project in Washington State to test automated collision avoidance systems and automated braking for buses. He also serves as Chair of the Transit Cooperative Research Program (TCRP) panel on Effects of Automation on the Transit Workforce. Jerry's career includes 50+ years of professional experience in transportation planning and engineering. He retired from positions as Distinguished Research Professor at New Jersey Institute of Technology and as Senior Director of Statewide and Regional Planning at New Jersey Transit, where he planned new light rail lines and the Newark International Airport rail station. Jerry earned Masters and PhD degrees in Architecture and Urban Planning from Princeton University where he was appointed Assistant Professor of Civil Engineering and Lecturer in Architecture and Urban Planning. A Fellow of the Institute of Transportation Engineers, Jerry has been actively involved in developing and teaching Intelligent Transportation Systems (ITS) standards for the transit industry. He is a licensed professional engineer, a certified planner, and a US Air Force veteran.

Breakout Session 5

Moderator

Dr. Allison Conway
City College of New York , CUNY

Alison Conway is an Associate Professor of Civil Engineering at the City College of New York. She is also an associated researcher to MetroFreight, a Volvo Research and Education Foundations Center of Excellence in Urban Freight. She currently serves as Chair of the ASCE Transportation and Development Institute's (T&DI) Freight and Logistics Committee, as Chair of the Transportation Research Board's (TRB's) Freight Data Committee, and as a member of TRB's Urban Freight Committee.

Presenters:

Ashley Berg
RedRoute

Ashley Berg is the Head of Expansion for RedRoute, a NYC-based startup that offers an automated agent to reduce call center expenses. She has degrees in Mechanical Engineering and Business from the University of Pennsylvania and previously managed export operations at ExxonMobil. After making the transition from a Fortune 10 company to a nimble 20-person team, she has since embraced the startup culture and enjoys leading RedRoute's business development into ground transportation and beyond.

Speakers

Breakout Session 5 (continues)

Presenters:

Dr. Ziqian (Cecilia) Dong
New York Institue of Technolgoy

Ziqian (Cecilia) Dong, Ph.D., is an Associate Professor in the Department of Electrical and Computer Engineering at New York Institute of Technology. She was awarded the Hashimoto Prize for the best Ph.D. dissertation in Electrical Engineering, NJIT. She is the recipient of 2006 and 2007 Hashimoto Fellowship for outstanding scholarship and recipient of the New Jersey Inventors Hall of Fame Graduate Student Award for her inventions in network switches. She is the recipient of the NYIT Presidential Engagement Award in Student Engagement in Research and Scholarship. Her research interests include high-performance computer networks, network security and forensics, wireless sensor networks, assistive medical devices, and using technology to improve sustainability and resilience of both natural and built environment. Her research has been supported by the National Science Foundation, Northrop Grumman, Motorola, National Collegiate Alliance for Inventors and Innovators, Xilinx, and NYIT. She serves as program director for NYIT College Engineering and Computing Sciences Undergraduate Research and Entrepreneurship Program. She also serves as faculty mentor for the Society of Women Engineer NYIT student chapter. She is a senior member of the IEEE Communications Society, IEEE Women in Engineering, and a member of the American Society for Engineering Education (ASEE), ACM, and the Environmental Sensing, Networking and Decision-Making (ESND) technical committee. She has served in technical program committee of IEEE ICC, GlOBECOM, HPSR, IEEE Sarnoff, IEEE GreenCom and ChinaCom, and as a reviewer for IEEE journals, conferences and NSF panels.

Paul Rivers
Hunter College, CUNY

Paul Rivers is a Hunter College Geography M.A graduate. His research interests include a diverse set of climate change related topics, including urban environmental problems and the use of technology and data to investigate mitigation solutions. He has worked at many of the most effective environmental – research institutions in NYC, including the Environmental Defense Fund, Clinton Foundation, C40 Cities, and CCRUN.

Dr. Ricardo Daziano
Cornell University

Ricardo Daziano, choice modeler and PhD in economics, is an associate professor of Civil and Environmental Engineering and of Systems Engineering at Cornell University. His research goal is to better understand the interplay of consumer behavior with engineering, investment, and policy choices for energy-efficient technologies and for sustainable urban mobility. In 2013, Daziano received an NSF CAREER award for deriving and analyzing advanced demand estimators for energy-efficiency in personal transportation.

Nick Bhashyam
Athena Insights

Nick is an esteemed tech startup leader. He began his career in business by starting a non-profit organization while in college (branch of JDRF) for Type 1 and Type 2 Diabetes research and helping the disenfranchised in the Tri-State area. He continued onto medical school in NYC, during which he served as a Director of the ECHO Clinic, one of the largest funded free clinics in the USA. Also during his time in medical school, Nick built Athena Insights to help solve major issues facing drivers, cities, and other entities as the rideshare industry and economy grows. Nick is currently the Co-Founder and CEO at Athena Insights, the only platform with realtime TNC data.

James Dorman
Athena Insights

James is a well-regarded tech startup leader, advisor, and investor. As Startup Director he helped turn Xplicit Computing from a three-person group into a successful venture-backed company. He is a partner at NextGen Ventures and has advised numerous hedge funds, startups, and Fortune 500 companies. James also founded and was CEO at SeedLawyers, a platform that is revolutionizing the way startups find and retain legal help. Currently, he is Co-founder and COO at Athena Insights, the only platform with realtime TNC data.

Plenary Session 6

Moderator

Dr. Robert E. Paaswell
Distinguished Professor, The City College of NY, CUNY

Dr. Robert Paaswell is a Distinguished Professor of Civil Engineering at the City College of New York, the flagship institution of The City University of New York (CUNY). He served as its Interim President from 2009-2010. He is the emeritus Director of the College's University Transportation Research Center, Region II and the founding Director (2001-present) of the CUNY Institute for Urban Systems (CIUS). He is also Site Director of the new NSF sponsored Industry/University Cooperative Research Center: Sustainably Integrated Buildings and Sites Center. A civil engineer and former CEO of the Chicago Transit Authority, Dr. Paaswell is an internationally recognized expert in public transportation issues and consulting. Dr. Paaswell is a Distinguished Member of the American Society of Civil Engineers.

Presenters:

Dr. John C. (Giancarlo) Falcocchio, P.E.
New York University

Dr. John Falcocchio is professor of transportation planning and engineering at the NYU Tandon School of Engineering where he has served as the director of the Urban Intelligent Transportation Systems Center, and head of the Department of Civil Engineering. His transportation career has been shaped through a professional blend of academic and practical work experiences in the analysis, planning, and engineering of transportation systems.

Matthew Rosenbloom-Jones
Union Internationale des Transports Publics

Matthew Rosenbloom-Jones has several years of experience working in transit planning, and he currently splits his time between working as a Technical Associate for the International Association for Public Transport and working as a Senior Planner at the Western Connecticut Council of Governments. Matthew has held prior positions working in planning at Minnesota Valley Transit Authority in Minneapolis and Regional Transit Service in Rochester, NY. He holds a Bachelors Degree in Urban Studies from Canisius College in Buffalo, NY and holds a Masters in Regional Planning from SUNY Albany where he received the AITE Scholarship from the UTRC. Matthew's passion in the field is continuing to develop best practices in public transit to increase the overall quality of service offered to the public.

Gerry Bogacz
New York Metropolitan Transportation Council

Gerry Bogacz has been the Planning Director for the New York Metropolitan Transportation Council (NYMTC) since 1997. NYMTC is a regional council of governments which is the metropolitan planning organization for New York City, Long Island and the lower Hudson Valley. NYMTC is responsible for planning for the use of Federal transportation funding in its planning area. Prior to his work at NYMTC, Gerry spent ten years as the Director of Planning for the Westchester County Department of Transportation. He holds a Master's degree in Urban Planning from NYU and a Master's degree in Public Affairs from Fordham University.

Plenary Session 6 (continues)

Presenters:

Dr. Rae Zimmerman
New York University

Rae Zimmerman, Ph.D., is Research Professor and Professor Emerita of Planning and Public Administration and Director of the Institute for Civil Infrastructure Systems at New York University's Wagner Graduate School of Public Service, and prior to that she was on NYU-Wagner's full-time tenured faculty. She is an elected AAAS Fellow, Society for Risk Analysis Fellow, Past President, and outstanding service award recipient and has held numerous professional committee appointments including TRB's Critical Transportation Infrastructure Protection standing committee (ABR10) and the NPCC. Zimmerman researches and develops practical applications for new multimodal options including CAVs integrating user and industry behavioral components and infrastructure interdependencies. Her expertise includes social impact analysis, infrastructure networks, risk perception and communication, security, and emergency planning for human and natural threats, combining social science, natural science and engineering. She authored or co-authored over 180 publications and served as principal investigator on about three dozen grants, including co-PI on autonomous vehicles research (2019-2020). Her recent book is Transport, the Environment and Security: Making the Connection. Education: B.A. Chemistry, University of California (Berkeley), Master of City Planning, University of Pennsylvania and Ph.D Planning, Columbia University. URL: http://wagner.nyu.edu/zimmerman

Poster Session Speakers

Eco-driving Strategy for Connected Autonomous Vehicles Encountering Truckplatoons Merging on the Highway

Carrie Conton,
Undergraduate Student Researcher at Prairie View A&M University (PVAMU)

Conton is a senior Mechanical Engineering student at Prairie View A&M University. She worked three years at Caterpillar Inc. as a corporate intern for their Medium Track Type TractorsTeam. Her first experience as an undergraduate research started in the summer of 2019 where she worked under Dr. Xiaozheng (Sean) He at Rensselaer Polytechnic Institute (RPI). There, she performed research simulating and modeling traffic using mathematic modeling. She is currentlyperforming research with Dr. Judy A. Perkins at PVAMU where she is finding mobility solutionsfor elderly, veterans, and people with disabilities. After she finishes undergraduate degree, she plans to attend graduate school in civil engineering with a concentration in transportation design.She would like to go on and teach at the university level while performing her own research on transportation design solutions.

Dr. Xiaozheng (Sean) He,
Assistant Professor at Rensselaer Polytechnic Institute (RPI)

He joined the Department of Civil and Environmental Engineering as an assistant professor in 2017. He received his Ph.D. degree from the Department of Civil and Environmental Engineering at the University of Minnesota, Twin Cities. He also has B.S. and M.S. degrees in computational mathematics. His expertise is in modeling and simulating transportation systems with an emphasis on the impacts of emerging technologies and network disruption. He also works on problems related to=transportation systems resilience, connected and autonomous vehicle systems, and electric vehicles. His collaborated research paper on modeling information flow propagation in a vehicle-to-vehicle communication network won the third best paper award at the 18th International IEEE Conference on Intelligent Transportation Systems. He serves as a reviewer and guest editor for several journals and conferences

A Comparative Energy and Economic Analysis of Last Mile Distribution Modes

Robert DeDomenico
Founder and CEO, CargoFish

Robert DeDomenico is a former nuclear control room operator with 27 years experience in commercial power after six years in the US Navy, serving as a Submarine Reactor Operator and Electronics Technician. He holds a degree in computer science. His lifelong love of and experience in model railroading, bicycling, slot cars, sailing, windsurfing, hang gliding, skiing, math and science provide him a broad practical background. Over the last nine and a half years, he has devoted nearly ten thousand hours to the research and development of a novel last mile distribution utility technology branded CargoFish, including numerous trips and presentations. He has presented at the First International Physical Internet Conference, the International Urban Freight Conference, the Royal Geographic Society Annual meeting, and several other venues. More about his work is available at his website: www.CargoFish.com.

Bringing Dynamic Message Sign Information Into Vehicles

Robert L. Gordon
President, ALMAGuide, LLC

Bob Gordon has over forty years of experience in the functional design of Intelligent Traffic Systems (ITS) and traffic signal systems. His experience highlights include the following:

- Development of traffic control & management strategies & equipment deployments to implement these strategies.
- Preparation of Concepts of Operation and System Engineering Analysis reports for ITS projects.
- Development of ITS control algorithms and software specifications.
- Developer of ETSIMS Lite, a system for providing dynamic message sign messages and related traffic messages in the vehicle.
- Development of ALMA, a system for selecting the most appropriate freeway lane and a target speed for the lane.
- Development of PlanSked, a software suite that develops the number of signal timing plans required and their schedules.
- Author of "Intelligent Transportation Systems", Springer, 2016.
- Extensive research work for FHWA and TRB.

Poster Session Speakers

Charles Ardilio
Business Development & Marketing, ALMAGuide, LLC

Charles G. Ardilio, received BSEE from SUNY Buffalo and earned several certificates in Transportation, Navigation Systems, presently enrolled in the Real Estate and Asset Management Certificate Program at Cornell. Mr. Ardilio has over 35 years of combined engineering, marketing, new business development experience in Intelligent Transportation Systems (ITS), complex military systems, transit communications, passenger information systems and security systems.
Recent work related to "in-vehicle presentation of information on dynamic message signs" – Prepared specifications and bid packages for dynamic message signs with several agencies. Responsible for ITS Control Room Design for many cities and several local projects including NYSDOT Region 9, Binghamton and NYSDOT Region 10, INFORM, design responsibilities for Traffic Management Center (TMC) building facility, associated computer data centers, operations rooms, video walls and operator consoles. Responsible for the product development from conceptual design through prototype evaluation for a real-time passenger information (RTPI) sign display system for NYC DOT, currently in production and installation throughout all 5 boroughs of NYC; and, recipient of the ITSNY 2015 Project of the year award for proof of concept for this RTPI project.

Forecasting E-Scooter Competition With Direct and Access Trips by Mode and Distance in New York City

Mina Lee (Poster Presenter)
Graduate Student Researcher, Department of Computer Science and Engineering;
Dr. Joseph Y. J. Chow
Assistant Professor and Deputy Director, Department of Civil and Urban Engineering;
Gyugeun Yoon
Ph.D. Candidate, Department of Civil and Urban Engineering;
Brian Yueshuai He
Ph.D. Candidate, Department of Civil and Urban Engineering
New York University, C2SMART University Transportation Center

Mina Lee is currently a Master student in the Department of Computer Science and Engineering at New York University. She received her Bachelor's Degree in Applied Statistics and Economics from Yonsei University in South Korea. After graduation, she worked as a data analyst at LG Uplus for three years. Her research interests include perception of new transportation technologies, behavioral informatics, and operation research.

Transportation Safety Technology Initiatives Focusing on Defensive and Universal Design

Anil Mujumdar
Visiting Lecturer, School of Law

Air Taxi Skyport Location Problem for Airport Access

Srushti Rath (Poster Presenter)
Graduate Student, Department of Transportation Planning and Engineering;

Srushti Rath is currently a graduate student at the transportation planning and engineering department at the Tandon School of Engineering in New York University (NYU), and is a member of the C2SMART lab (thesis advisor: Prof. Joseph Chow). She received the B. Tech. degree in civil engineering from the College of Engineering and Technology (CET), Bhubaneswar, India in 2014, and the M.Tech. degree in civil engineering from the National Institute of Technology (NIT), Agartala, India in 2016. From 2016 to 2018, she served as Assistant Executive Engineer at Housing and Urban Development Dept. (Odisha), Govt. of India, working on smart city projects. During the summer of 2019, she worked with the Uber Elevate data science team in San Francisco on pricing optimization for Uber Copter. Her research interests include optimization methods and machine learning with applications in urban transportation and logistics.

Dr. Joseph Y.J. Chow
Assistant Professor and Deputy Director, Department of Civil & Urban Engineering:
New York University, C2SMART University Transportation Center

Dr. Joseph Chow is an Assistant Professor in the Department of Civil & Urban Engineering and Deputy Director at the C2SMART University Transportation Center at NYU, and heads BUILT@NYU: the Behavioral Urban Informatics, Logistics, and Transport Laboratory. His research expertise lies in transportation systems, with emphasis on multimodal networks, behavioral urban logistics, smart cities, and transport economics. He is an NSF CAREER award recipient; he serves as the elected Vice Chair of the Urban Transportation SIG at INFORMS Transportation Science & Logistics Society, and is an appointed member of the Editorial Boards for Transportation Research Part B and the Committee on Transportation Network Modeling (ADB30) at the Transportation Research Board of the National Academies. Prior to NYU, Dr. Chow was the Canada Research Chair in Transportation Systems Engineering at Ryerson University. From 2010 to 2012, he was a Lecturer at University of Southern California and a Postdoctoral Scholar at UC Irvine, where he led the development of a statewide freight forecast model for Caltrans. He has a Ph.D. in Civil Engineering from UC Irvine (2010), and an M.Eng. (2001) and B.S. (2000) in Civil Engineering from Cornell University with a minor in Applied Math. Dr. Chow is a former Eisenhower and Eno Fellow and a licensed PE in NY.

Transit Network Design Problem (Transit-ND) - Impact on Network Travel Time Using a Transportation Planning Model (TPM)

Patricio Vicuna F., **(Poster Presenter)**

City College of New York / University Transportation Research Center Region 2;

Dr. Camille Kamga, Dr. Kyriacos Mouskos, Dr. Sandeep Mudigonda

The City College of New York

Mr. Patricio Vicuna studied for his B.Sc. in Statistics and Computer Science, M.Sc. in Operation Research, Advanced Diploma in Data Mining and Project Management, M Phil. Civil Engineering, PhDc. Program in Civil Engineering in the field of Transportation at The City College of New York; his research is focused in the Development of a Decision Support Tool to Evaluate Transit Improvements Using a Metaheuristic based Model, his advisor is Professor Camille Kamga and co-advisor Dr. Kyriacos Mouskos.

Plenary Session 1

Modernizing the Subway System

Duncan Lewis, Thales Transport & Security, Inc

New York's subway system is one of the oldest in the world and has technology dating from almost 100 years ago in some areas. The Metropolitan Transportation Authority (MTA) has embarked on a program to modernize the state of the signal system that controls the train operation on New York City Transit (NYCT). The newer signal systems have been deployed on 2 of the NYCT lines and have dramatically improved the performance of those lines. These systems significantly automate both the control and management of the line. The improvement is fantastic but implemented the way it has, took considerable time and money. Solutions lie in doing things differently as well as using some promising advances in technology.

More recently, the MTA has accelerated those ambitions significantly. Namely the MTA has approved a 5 year capital plan that includes $7 billion for Signals improvement that expects to provide 50% of riders with the benefits of the NYCT subway system under modern signal systems. This is very ambitious and will take a highly coordinated partnership between the transit authority and the suppliers.

This presentation will provide an overview of the modernization and results to date and look forward to the benefits and challenges of new technology being integrated to further those goals to not only automate faster but get to the goal of autonomous operation while minimizing the equipment needed to install.

New York City Connected Vehicles Pilot Demo

Dr. Mohamad Talas, New York City Department of Transportation (NYCDOT)

The City DOT have been deploying ITS projects on our Limited Access Highways and Local Streets network with the vision to support travel safety and mobility. Many of those projects are completed, in progress and in plans as Midtown In Motion, Smart Lights, TSP and highways deployment. The NYC connected vehicle project is in progress today, leads the global efforts in the use the real-time dynamic communication among connected vehicles and infrastructure to improve travel safety and reduce crashes.

The CV technology is seen as a new tool to help NYC reach its Vision Zero goals to eliminate traffic related deaths and reduce crash related injuries and damage to both the vehicles and the infrastructure. The NYC deployment is primarily focused on safety applications – which rely on vehicle-to-vehicle (V2V), vehicle-to-infrastructure (V2I) and pedestrian-to-vehicle (P2V) communications.

As part of this project, the City plans to install the CV technology in city fleets which frequent the streets of Manhattan. The installation is in progress and over 600 vehicles already have the In Vehicle devices installed. Approximately 450 road side units (RSU) will be installed in Manhattan; 280 are already installed, in Manhattan and along Flatbush Avenue in Brooklyn, and at other strategic locations such as bus depots, fleet vehicle storage facilities, river crossings and airports. RSUs will also be installed along portions of the FDR Drive to support applications such as curve speed warning and over dimension vehicle warnings (over height and prohibited commercial vehicles). The safety application were tested for production last August and the project team continue to optimize and refine the software algorithms.

Perspectives from Audi on the Future of Mobility

Alison Pascale, Audi

The development of automated vehicles was made possible by the robotics and artificial intelligence work undertaken at research universities. Many companies currently testing automated driving technologies were founded by pioneers from these same universities. New York, with its strong university system and specialized research conducted at places like University at Buffalo, is in a good position to contribute to the next level of development around automated vehicles such as figuring out how to make them truly accessible to achieve their promise of increased mobility for all. Volkswagen Group of America is committed to provide broader access to transportation for people with disabilities and is collaborating with disability advocacy groups as well as with the University at Buffalo to realize this goal. Many additional steps are needed to prepare for automated vehicles. Industry has come together to start the work of educating the public on automated vehicles through PAVE (Partners for Automated Vehicle Education) and efforts are underway to develop safety standards to increase public confidence and trust. We'd like to see New York get more involved in developing and testing technology innovations around automated vehicles but changes in the regulatory environment will be needed first.

Breakout Session 2

Innovative Mobility Technology in Historical Context

Dr. James Cohen, John Jay, CUNY

This paper places technologically innovative, urban and intercity mobility solutions in historical context, in order to identify key technical, political, regulatory, social, and financial factors affecting their implementation, and to draw lessons for current practice.

In the first three decades after the end of World War 2 period, scientists and engineers in the United States (U.S.) and elsewhere developed highly advanced technology--induction motors and magnetic levitation--which were then used to propel air cushion vehicles (ACV's), personal rapid transit "pod" systems (PRT), and maglev trains. Development of these new technologies coincided with what many experts claimed was the obsolescence of steel-wheeled, heavy rail, urban tramways and intercity trains, with emerging metropolitan congestion problems areas, and with limits on airport development. Transportation professionals in both government and industry became very enthusiastic about alternative technologies. For example, in the 1960's and 70's, the federal government, in cooperation Rohr Aerospace and Boeing-Vertol, attempted to implement PRT--fully automated, "intelligent" transit, where small vehicle "pods" would operate on a network of elevated urban guideways. Rohr also developed and tested a moderate speed prototype ACV for suburban and downtown-to-airport routes. And U.S. DOT and Grumman Aerospace built a prototype ACV designed to operate at 300 mph on intercity lines.

Yet, very little advanced technology from that period was ever implemented. Does this same fate await contemporary intelligent transport proposals, such as autonomous and connected vehicle systems, PRT, or proposals for high speed, intercity hyperloop and maglev lines? Based on extensive research on the history of PRT, ACV's, and related technology, this paper describes and analyzes critical factors that impeded implementation of those innovative mobility technologies and that, because they continue to play a role at present, provide lessons for current planning and practice.

Effects of Connected and Automated Vehicles in a Cooperative Environment

Ondrej Pribyl, Ph.D., Professor, Vice-dean for International Relations and Head of Department of Applied Mathematics, Czech Technical University in Prague

Connected and automated vehicles (CAVs) are often considered a mean to improve quality of life in cities. CAVs do not only serve as a new source of information (for example to estimate the queue-length at an intersection with higher precision), but through for example speed or lane change advisory or routing algorithms, they can make traffic more energy-efficient and fluent, and the traffic flow in the network more balanced. So much the expectations.

This paper describes the impact of CAVs on a cooperative urban environment, resulting from a European research project - MAVEN. The evaluation covered different dimensions, including user surveys, field tests and simulations. Here, the results from a microscopic traffic simulation (using tool SUMO) demonstrating the impact on different indicators (such as number of stops, delay or emissions) are presented. One of the key advantages of this approach is in addressing the effects not only for different layouts or traffic volumes, but also for the transition phase, i.e. different penetration rates of CAVs.

We clearly demonstrate that a proper integration of CAVs into city traffic management can, for example, help with respect to the environmental goals and reduce CO2 emissions by up to 12 % (a combination of GLOSA and signal optimization). On corridors with a green wave, a capacity increase of up to 34% was achieved. Already for lower penetration rates (20% penetration of CAVs), there are significant improvements in traffic performance. For example, platooning leads to a decrease of CO2 emissions of 2,6% or an impact indicator by 17,7%.

The findings can be used not only by other researchers but mainly by traffic managers and decision-makers in cities, as they can provide a better idea about the actual impacts of particular solutions in a cooperative environment and to help with the transition phase.

Breakout Session 2 Continues

Unintended Consequences of Autonomous Vehicles: Facilitation of Human Trafficking

Anil Mujumdar, Visiting Lecturer, School of Law; **Elsa Tedla**, Assistant Research Engineer, College of Engineering; **Emmanuel Kofi Adanu**, Post-Doctoral Research Assistant; **Matthew Hudnall**, Associate Director, Institute of Business Analytics; **Olufikayo Oluwaseun Aderinlewo**, Lecturer, Department of Civil Engineering; **Praveena Penmetsa**, Associate Research Engineer, Alabama Transportation Institute; **Silvana** V**. Croope**, Resilience Researcher Engineer, Alabama Transportation Institute; **Steven Jones**, Professor, College of Engineering and Visiting Lecturer, Department of Civil & Environmental Engineering

In recent years, popular media and academic research have paid considerable attention to the promise of autonomous vehicles (AVs) both to reduce congestion and increase safety. At the same time, awareness of human trafficking prevention has migrated from the law enforcement and social science communities into transportation professions. The Counter Trafficking Data Collaborative (CTDC) has compiled information from some 92,000 human trafficking cases globally. While the sheer magnitude of the CTDC information illustrates the human tragedy of the situation, it also reveals the extent to which human trafficking is based on abuse of existing transportation systems from public transit to the trucking, shipping, and airline industries. As AV technologies are developed and deployed throughout commercial vehicle and public transit fleets, new challenges and opportunities to combating human trafficking will emerge. For example, the ability to track vehicles and ensure compliance with rules, regulations, routes, and schedules will increase. On the other hand, the eventual removal of human drivers proposed within some AV deployment scenarios also removes humans from anti human trafficking efforts. As such, future perpetrators of human trafficking may exploit AV technology to exploit people. This paper explores a range of academic and non-academic literature in conjunction with relevant policy documents to establish an understanding of how AV technologies will impact human trafficking across a range of transportation modes at various scales (regional, national, and international). The goal of the work is to bring awareness of this tragic issue and its relationship to the global transportation enterprise into AV development and deployment discussions so that these technologies can also add promise towards combating human trafficking.

A High-Capacity Low-Waiting Time Intersection Management System for Connected Autonomous Vehicles

Dr. Quanyan Zhu, Assistant Professor; Siyu Zhou, Ph.D. student , NYU Tandon; NYU

Connected and autonomous driving recently emerges as a modern technology that can revolutionize transportation. However current traffic systems and rules are still designed for unconnected human driver vehicles. To fully exploit the massive potential benefits of connected and autonomous vehicles (CAV), we introduce a Maximum Utilized Spatio-temporal Intersection for CAV management system that helps CAVs or platoons of CAVs to maximize road utilization on a cross intersection, the major bottleneck for current urban traffic. Using a customized spatio-temporal scheduling map, the traffic controller commands each CAV or platoon of CAVs when to enter the contentious area of intersection with sufficient safety margin and maximizing contentious zone utilization efficiency. Based on the simulation data we collected the entire intersection throughput capacity can increase by 60% - 70%. The management system also provides a realistic and implementable solution that decreases CAV's average waiting time at intersection by more than 90%. The controller's methodology could potentially have a profound impact on future transportation and the way people travel in the future.

Breakout Session 3

Multimodal Planning and Travel Demand Management with Big Data

Pam Cruz, Northeast Territory Manager, StreetLight Data

The transportation industry is drastically changing and quickly. The need for Travel Demand Management (TDM) and Multimodal planning is growing. But how can we identify the best projects to invest in? What vehicle trips are most likely to convert to other existing modes and new options as they are introduced? When every neighborhood is clamoring for better sidewalks, where do you begin? In this session, StreetLight Data will answer these questions using geospatial "big data" from mobile devices. As we will illustrate, beginning the TDM process with real-world data that represents a large sample of the population has unique advantages.

Pam will begin the presentation by describing how key transportation analytics can be derived from big data: hourly traffic volumes, origin-destination matrices, trip speed, trip duration, free flow factor, traveler demographics, and trip purpose. Next, she will walk through real-world case studies to demonstrate the benefits of using big data at all stages of planning. Projects include a city-wide scan of travel patterns to identify the best opportunities for bike and pedestrian infrastructure projects, corridor-level study to diagnose a particular traffic jam, a traffic impact study to plan for increased tourism, a study to understand the economic impact from tourism, and tracking commercial truck behavior for freight mitigation plans.

Pam will wrap up his discussion by illustrating that big data can save time and resources at the beginning of a project and discuss best practices. Big data can greatly complement other elements of transportation planning and public engagement. By the end of the session, attendees will understand that big data analytics can be of great value to planners and traffic engineers in solving problems effectively and efficiently.

Investigating Taxi and Uber Competition in New York City: Multi-agent Modeling by Reinforcement-learning

Saeed Vasebi, Ph.D. Candidate, School of Systems and Enterprises; **Dr. Yeganeh M. Hayeri**, Assistant Professor, School of Systems and Enterprises, Stevens Institute of Technology

Taxi service business has been overly regulated for many decades. Regulations are supposed to ensure safety and fairness within a controlled competitive environment. By influencing both drivers' and riders' choices and behaviors, emerging e-hailing services (e.g. Uber and Lyft) have been reshaping the existing competition in the last few years. This study investigates the existing competition between the mainstream hailing services (i.e. Yellow and Green Cabs) and e-hailing services (i.e. Uber) in New York City. Their competition is investigated in terms of market segmentation, emerging demands, and regulations. Data visualization techniques are employed to find existing and new patterns in travel behavior. For this study, we developed a multi-agent model, and applied reinforcement learning techniques to imitate drivers' behaviors. The model is verified by the patterns recognized in our data visualization results. The model is then used to evaluate multiple new regulation and competition scenarios. Results of our study illustrate that e-hailers dominate low-travel-density areas (e.g. residential areas), and that e-hailers quickly identify and respond to change in travel demand. This leads to a diminishing market size for hailers. Furthermore, our results confirm the indirect impact of Green Cabs' regulations on the existing competition. This investigation along with our proposed scenarios can aid policymakers and authorities in designing policies that could effectively address demand while assuring a healthy competition for the hailing and e-haling sectors.

Breakout Session 3 Continues

State-of-the-Art Web-Based Congestion, Reliability and Incident Analysis

Dr. Catherine T. Lawson, Associate Professor, Unversity at Albany/AVAIL

UAlbany's Albany Visualization and Informatics Lab (AVAIL) developed a state-of-the-art web-based congestion, reliability and incident analysis tool for the New York State Department of Transportation (NYSDOT) and the New York State Association of MPOs (NYSAMPO), using the National Performance Management Research Data Set (NPMRDS). The research includes advanced analytics with interactive visualizations and a series of transportation planning case-studies from across New York State. AVAIL will discuss the communicable value of the various performance measures, including the ability to produce Congestion Management Plans (CMPs), and corridor studies, using the NPMRDS. AVAIL will also discuss how the unique partnership between NYSDOT and NYSAMPO, as a technical working group, led to a number of advancements in congestion and reliability performance management and planning. These advancements include newly developed local system performance measures, insightful data visualizations, and best practices in software database management and user interface design. Our research addresses the lack of synchronized data and analysis between the national performance measures and state and local planning. New York State is now able to provide a statewide approach to performance measurement across regions and planning sectors. The New York State DOT created a unique Technical Working Group to advise this research which included State DOT and MPO staff. This working group interacted regularly with the tool development team, guiding the user interface design, software features, and the development and implementation of new performance measures. Our research assisted in aligning the state on congestion and reliability performance measurement, with powerful, easy to use analysis tools for before/after, bottlenecks, network effects of incidents, and a variety of comparisons for custom corridors. Users share templates of prepared analyses that populate with local data, for like-kind analysis. Challenges remain with syncing probe data with counts data and with implementing tools for real-time probe data ingestion.

Exploring the Long-term Impacts of ACES and Employer-Provided Mobility Systems and Services:
A tale of three cities and four metro region employers for informing future R&D and integrated mobility directions

Drs. Stanley Young and Joshua Sperling, National Renewable Energy Laboratory
and **Dr. Camille Kamga and Dr. Sandeep Mudigonda,** The City College of New York

This talk provides an overview of new threads of emerging research at the National Renewable Energy Lab. This includes a NYSERDA/NYSDOT-funded ACES mobility project with CUNY, and a DOE-funded Employer Provided Mobility (EPM) project with the Denver metro region, as two potentially significant strategies for developing sustainable mobility in urban areas. The objectives of the first portion of this talk is to share the customized analyses (from initial national-level studies), focused on NYS, using region-specific data, plans, policies, forecasts. This includes emphasis on the synergies between shared, connected, automated and electric/efficient (ACES) mobility systems, with results focused on: 1) informing deployment/adoption scenarios; 2) high-potential smart city and community demonstration localities as well as related equity considerations; and 3) identifying drivers of changes in travel behavior and associated benefits and risks using surveys, data collection, and several scenarios. For the second half of this talk, we zoom in to EPM. EPM is not a new concept, as employers have facilitated carpools and transit access for decades as part of the spectrum of choices for commuting to work. Traditionally, these legacy efforts have been referred to as transportation demand management (TDM), and have often included involvement from planning agencies and other entities rather than from employers themselves. However, in the past decade technology combined with societal changes (some of which have been incubated by technology) has greatly influenced both the spectrum of mode choices available and their desirability to employees seeking alternatives to driving alone. New choices include employer provided buses equipped with Wi-Fi, micro-mobility such as electrified scooters and bicycles, and on-demand transit, which can be combined with traditional modes of carpool and transit (all enhanced with smartphone connectivity) to expand the modal choices. Strained infrastructure and road capacity in many metropolitan areas, coupled with generational and cultural shifts in attitudes toward mobility, are pushing more of the burden of commuting logistics onto employers. These EPM factors are identified as having the potential to significantly impact commute travel dynamics with implications for urban regions and employer investments. Initial estimates suggest a potential savings of 942,100 gallons of gasoline and 8,573 mt-CO2e annually from a coordinated effort by employers in four employment clusters in the Metro Denver region. The talk concludes by integrating concepts of ACES and EPM for informing future mobility systems

Breakout Session 3 Continues

If Automated Vehicles (AV) become ubiquitous in New York New Jersey Region in 2040…

Leo Tsang, Principal Transportation Planner/Modeler Department of Planning and Regional Development, The Port Authority of New York and New Jersey

In recent years, automated vehicles (AVs) have drawn significant amount of attention and generated enormous discussions.

While people of the optimistic point of view advocate that AVs would offer a higher comfort traveling experience, lower travel cost, add road capacity without additional investment and increase mobility to many disadvantaged and minority groups, people who are pessimistic, on the other hand, argue that AVs would promote urban sprawl, discourage usage of public transportation and increase burden to the environment. However, it is still too early to accurately predict how people would react to AVs .

In this presentation, we will explore the likelihood of changes in travel behavior and travelers' reaction to the emergence of AVs from a transportation planning and modeling point of view. Using the current travel demand model of New York (also known as New York Best Practice Model, NYBPM), serval hypotheses have been tested to understand how travelers in the New York New Jersey region would react to AVs and their implications to our future transportation system given their current travel behavior.
These hypotheses include:

1. what if AVs would be able to drive with a much shorter (or longer) safety following distance as the technology promises;

2. what if AVs would give access to every public transportation location including bus stops, subway and train stations which is currently limited by proximity to one's home location and by the availability of parking spaces; and
3. what if the ability and restriction to operate an automobile become irrelevant because the cost of hiring AVs become so low that everyone could have access to a vehicle.

We will look at impacts of these hypotheses in terms of roadway capacity, capital investment, public transportation ridership and environment.

Breakout Session 4

Evaluation of LIRR At-Grade Intersections for Implementation of Adaptive Traffic Signal Control

Michael Shenoda, Assistant Professor, Farmingdale State College (SUNY)

At-grade railroad crossings can cause major traffic delays when trains utilize them. Furthermore, incidents involving the interaction of vehicles, trains, and pedestrians, which are apt to occur at these crossings, can be catastrophic and cause even greater delays. Both of these have been the case for the Long Island Railroad (LIRR). The most common remedy for these issues is the construction of grade separation structures to prevent this interaction. Such remedies are quite costly and can take years to plan and execute. A more viable option that address these issues may be adaptive traffic signal control. This is, essentially, a method of predicting and implementing timing of signals based on "real-time" traffic data. Adaptive control can potentially be used, alone or in combination with other mitigation measures, to reroute traffic around these in case of (or to avoid occurrence of) incidents and delay. Herein, LIRR at-grade intersections are prioritized and studied in the field to consider the potential for improvement strictly based on vehicle delay for typical train crossings. Selected intersections were then evaluated for re-routing using adaptive control. The potential for delay improvement was seen to be based on the length of crossing closure, the proximity of adjacent intersections and crossings, and the nature of the crossing itself (geometric issues like width and angle, traffic volumes, and current signal timings). Future considerations for implementation are made based on potential costs, ability to manage traffic during incidents, and combination with other measures.

Breakout Session 4 Continues

Moving Beyond Work Zones Maintaining Mobility Across New York City Agency Boundaries

Adam S. Levine, P.E., AICP, Traffic Safety and Mobility Director; Irene Sadko, P.E., LEED AP BD&C, Manager Regional Program Coordination, Engineering and Construction,
New York State Department of Transportation, New York City Region; MTA Bridges and Tunnels

New York City is currently in the midst of the largest re-invigoration of its arterial transportation infrastructure in decades. Across the five boroughs, capital projects are underway or nearing construction along major corridors and crossings now and for the next several years. While each of the transportation agencies involved have their own internal processes for reviewing and managing congestion due to work zones, the sheer scale and scope of the current capital plan requires a new approach, one that sees past agency boundaries and draws upon all available tools to improve mobility.

Led by the New York State Department of Transportation and Metropolitan Transportation Authority Bridges and Tunnels, a working group of senior staff has been meeting biweekly since December, sharing project scheduling information and focusing on those adjacent projects that individually may have minor to moderate congestion impacts, but combined could significantly impact mobility.

Drawing upon GIS, traffic simulation modeling and real-time traffic flow tools, the working group has mapped projects to develop focus areas and corridors, developed "heat maps" indicating when work along a corridor/region will be most intense, and modeled lane closures and anticipated diversions to make informed decisions on how to mitigate traffic impacts and modify work plans to reduce queuing. They have also partnered with rideshare services to develop targeted outreach to major employers. The working group has expanded to include additional state and city agencies, as well as major utility companies, and the newly formed lines of communication along with the decision-informing tools developed have proven invaluable in resolving issues and improving mobility throughout the city.

Optimal Allocation of Curbside Space

Dr. Scott Le Vine, Assistant Professor; Senior Transportation Planner,
SUNY New Paltz; Transpo Group

The emergence of various new forms of urban mobility services in recent years is leading to new pressures on curbside space. Municipalities, the entities typically responsible for managing the curbside, are in many instances handling these growing pressures by reallocating portions of the curbside away from traditional uses (such as metered and residential parking) in favor of uses such as ridehailing, scooter and bike-share corrals. As yet, however, such actions are being undertaken on an ad-hoc basis, due to the rapidly growing complexity of the curbside and the lack of standard analytics. In this presentation I present a proposed framework for modeling inter-modal competition for curbside space, intended to support curb managers seeking to optimize curb space allocation. I also present findings from a set of 10 semi-structured interviews with senior curbside-management staff at large U.S. municipalities.

How We Are Testing an Automated Collision Avoidance and Emergency Braking System for Buses and What We Have Learned So Far

Jerome M. Lutin, PhD, PE, AICP, F.ITE, Senior Director of Statewide and Regional Planning, Principal Investigation, New Jersey Transit (Retired); Pierce Transit Collision Avoidance and Mitigation Safety Research and Demonstration Project

The emergence of various new forms of urban mobility services in recent years is leading to new pressures on curbside space. Municipalities, the entities typically responsible for managing the curbside, are in many instances handling these growing pressures by reallocating portions of the curbside away from traditional uses (such as metered and residential parking) in favor of uses such as ridehailing, scooter and bike-share corrals. As yet, however, such actions are being undertaken on an ad-hoc basis, due to the rapidly growing complexity of the curbside and the lack of standard analytics. In this presentation I present a proposed framework for modeling inter-modal competition for curbside space, intended to support curb managers seeking to optimize curb space allocation. I also present findings from a set of 10 semi-structured interviews with senior curbside-management staff at large U.S. municipalities.

Breakout Session 5

Innovative Call Center Automation to Improve the Customer Experience

Ashley Berg, RedRoute

It is important for passenger ground transportation companies to deliver a positive customer experience that is accessible to all demographics. This experience is unfortunately inconsistent across technology channels, as smartphone applications have received much of the attention over phone calls. Many passengers do not have or are unable to use a smartphone and instead rely on phone calls to manage their rides. Now, new developments in voice technology enable "automated agents" to provide an innovative customer experience over the phone.

Blockchain Implementation for Analysis of Carbon Footprint across Food Supply Chain

Denisolt Shakhbulatov, Arshit Arora, Dr. Ziqian Dong˚, New York Institute of Technolgy
and **Roberto Rojas-Cessa,** New Jersey Institute of Technology

The growing global population and the consequential increasing food demand have had a great impact on the environment and thus on the climate. Efforts are being made to reduce carbon footprint to mitigate such effects. Calculating the carbon footprint of food products is complex and requires the cooperation of all the stakeholders of the food supply chain. A record keeping system for tracking carbon footprint while preserving privacy for the related parties is needed. This paper presents a new implementation of blockchain for tracking of carbon footprint on food production and transportation stages. We designed a system that tracks the carbon footprint of food processing facilities and transportation parties using clusterbased record keeping while preserving their privacy. We implemented the proposed carbon footprint chain and evaluated its throughput and latency under different scenarios. We show that our blockchain implementation is capable of operating with a larger number of nodes without any scalability issues.

A Smartphone App Survey to Encourage Sustainable and Healthy Travel Mode Choices

Paul Rivers, Geography, M.A Graduate; **Dr. Hongmian Gong**, Professor of Geography and Environmental Science; **Dr. William Solecki**, Professor of Geography and Environmental Science, Hunter College; University Transportation Research Center

The transportation industry is responsible for a large proportion of the global carbon emissions footprint. Stabilizing transport-sector related carbon emissions is consistent with global climate agreement frameworks. We analyzed the potential impact of smartphone app usage on public's transportation knowledge and behavior. We employed a survey method in conjunction with a smartphone app to quantitatively measure the influence of carbon footprint and health information on the recognition of emissions differences among transport modes and mode shift behavior. The smartphone app sends GPS data to a cloud server to detect transport modes and receives back daily carbon footprint and health indicators such as calorie and fat burn, while a survey was used to analyze participants' perception of emissions differences and observed and planned transport mode switches. Analysis was conducted using general statistics and non-parametric Mann Whitney U test to determine measured change over one week. We found that 13-23% of the survey pool noted changes in the recognition of carbon emissions differences among transport modes, and over half noted statistically significant observed and planned transport mode shifts from higher carbon to lower carbon modes (such as from car to subway) after usage of the mobile app. Of these, 40.9% of respondents noted that both carbon footprint and health considerations were motivations for mode shift; 13.6% noted only carbon footprint; 13.6% noted only health considerations. We concluded that providing motivations like calorie and fat burn, aside from purely environmental considerations like carbon footprint reductions, had a major impact on the purpose of observed and planned switches between modes. Policy or smartphone app technology investments aimed at incentivizing mode shifts through health-focused initiatives may have a better chance to successfully change public behaviors than efforts aimed exclusively at environmental awareness.

Breakout Session 5 Continues

Encouraging EV use: An Analysis of Survey Data about EV Uptake in Tompkins County and in Upstate New York

Dr. Ricardo A. Daziano, Associate Professor of Civil and Environmental Engineering , Cornell University

Energy markets are rapidly changing with smarter infrastructure and cleaner generation on the supply side, and more choice, greater control and enhanced flexibility for customers. Customers are also now able to optimize the proportion of energy that is coming from renewable sources, as well as to make informed decisions regarding shifting energy use to off-peak times, and better realize about the benefits of switching to energy-efficient technologies including electric vehicles (EV). In this paper we analyze survey data about EV uptake in Tompkins County and in Upstate New York. Customer preferences and perceived challenges are discussed in the specific area under analysis. Furthermore, as xEV penetration increases, the profile of electricity demand will change, creating major stress on the electric grid. A solution is to switch xEV charging load to non-peak times, which are less expensive and less carbon intensive. Part of the analysis focuses on customers' willingness to delay and/or limit charging and on how to create the correct incentives for such behavior.

Finally TNC Data

Nick Bhashyam, and **James Dorman** Athena Insights

If you live in the city and don't have a car, you most likely have the Uber app downloaded ready to be opened at a moments notice. Understanding where you and others are traveling to and from can help with more than just crowdsourcing the best place to grab a bite after the party. From researching how drop-offs affect street-side congestion to understanding how accessible our underserved communities are, access to rideshare mobility data is a critical. At Athena Insights, we provide cities with the previously unattainable TNC data so they can make more informed policy and infrastructure decisions

Plenary Session 6

The Future of Micro Mobility in the Manhattan CBD Depends on Reducing Traffic Congestion

John C. (Giancarlo) Falcocchio, Ph.D., PE, Professor of Transportation Planning and Engineering, NYU Tandon School of Engineering

Increasing traffic congestion in the Manhattan CBD has reduced the transportation mobility traditionally provided by motor vehicles, buses, and taxis.

Transportation mobility can be defined as the distance one can travel safely and conveniently with available travel modes and travel time budget. Thus for travelers with a fixed travel time budget, congestion tends to reduce long trips and induces short trips (less than 5 miles).

Short trips that prevail in the congested Manhattan CBD are increasingly served by walking and by emerging micro mobility modes which include various forms of bike-sharing, ridesharing, and on-demand ride services, including ride-hailing.
However, with a set supply of road space available for movement, the growing popularity of these new travel modes (especially the growth in the use of TNCs) has been reported to increase VMT and traffic congestion.

What MaaS Means for Fixed Route Transit and Communities

Matthew Rosenbloom-Jones, Union Internationale des Transports Publics

Mobility as a Service (MaaS) is a term that is thrown around a lot in regards to solving first and last mile transportation solutions, but what exactly does it mean? How can transit operators leverage the MaaS craze in a way that supplements, not detracts from, existing fixed route services? Will MaaS allow for a more equitable transportation system by expanding access to areas not served by transit, or it will it cause a further stratification of our transportation system along socioeconomic lines? This presentation will examine all of these issues, aiming to break down a lot of the jargon and hype that surrounds existing MaaS discussions and will provide clear answers to what MaaS means for fixed route transit and communities.

UITP is one of the premier leaders into research into MaaS and how it relates to traditional public transit. This presentation will share some of UITP's research into MaaS regulations as well as best practice approaches public transport authorities can engage in in regards to partnering with MaaS. This presentation will provide attendees with tangible strategies that can be used to engage with MaaS providers in regards of addressing first mile-last mile gaps as well as ways MaaS can supplement existing public transit networks.

Plenary Session 6 Continues

Encouraging EV use: An Analysis of Survey Data about EV Uptake in Tompkins County and in Upstate New York

Gerry Bogacz, Planning Director, NYMTC

The New York Metropolitan Transportation Council (NYMTC) and the Metropolitan Area Planning (MAP) Forum, a consortium of nine metropolitan planning organizations and councils of government in New York, New Jersey, Connecticut and Pennsylvania, have developed and are initiating a series of regional workshops to gather input for the development of a regional planning vision for Shared Mobility, broadly defined as transportation services and resources that are shared among users, either concurrently or one after another.

The regional planning vision will inform NYMTC and the MAP Forum members and will be reflected in their next round of long-range regional transportation plans, which guide the investment of federal funding in transportation projects and programs in New York City's multi-state metropolitan region. The development of this planning vision is considered important at present for the following reasons:

- Shared Mobility has developed and will continue to develop at a rapid pace;
- Municipalities, states and transportation agencies have often been caught off guard by these rapid developments;
- Greater awareness is needed of the opportunities presented by the development of Shared Mobility;
- Integrated approaches are needed to plan for and manage Shared Mobility;
- Solving transportation problems and redefining needs with developing technologies and services is an important imperative for regional planning; and
- Shared Mobility isn't currently fully accommodated in the overall transportation planning process.

The regional workshop series will explore perceptions of Shared Mobility service and information gaps; Ideas and suggestions about future improvements and investments for Shared Mobility; perceptions of the likely speed of future development and the profitability/sustainability of Shared Mobility services. The initial workshop was held in Suffolk County on September 18th as part of Long Island Mobility Week.

Challenges of Multimodal Networks Interconnecting Transportation Technologies: CAV and other Mode Innovations

Dr. Rae Zimmerman, Research Professor and Professor Emerita of Planning and Public Administration, Director, Institute for Civil Infrastructure Systems
New York University, Robert F. Wagner Graduate School of Public Service

Transportation technologies have multiplied including needs and opportunities for multi-modal transfers among them. Connected and Autonomous Vehicles (CAVs) are particularly challenging for last mile and longer distance services for passengers and freight. Research is presented that evaluates innovative multimodal connections among transportation modes including CAVs and provides network-based configurations reflecting behavior-driven preferences and flexibility of alternative transfer connections.

First, a framework is developed for typical multimodal transfers numerically scaled for usage frequency and trip purpose. Second, the framework is extended to alternative scenario-based multi-modal networks combining transportation technologies, trip transfers, vehicles, transfer usage, and trip purpose. Third, opportunities for different CAV technologies are then integrated into the multimodal framework. Fourth, behavioral elements are applied to multi-modal networks with and without CAV integration using extensive socio-economic literature to develop indicators on CAV user acceptability in light of technological and usage characteristics. Examples of literature-based technology indicators are CAV support, e.g., parking; availability/proximity and connectivity of CAVs to other modes e.g., ridesharing, for-hire services, micro-mobility; communication capability to identify connection points; and compatibility with other modes, including travel time and cost. Examples of user properties include willingness to use CAVs, safety, availability, convenience, accessibility, and affordability. Finally, flexibility of CAV deployment and substitutability within multi-modal networks to effectively confront different conditions are analyzed.

Eco-driving Strategy for Connected Autonomous Vehicles Encountering Truckplatoons Merging on the Highway

Carrie Conton
Undergraduate Student Researcher at Prairie View A&M University (PVAMU)

Dr. Xiaozheng (Sean) He
Assistant Professor at Rensselaer Polytechnic Institute (RPI)

Eco-driving strategies are a way for vehicles to become more energy efficient through the controlof vehicles dynamics. Highway merging locations, such as on-ramps, are a difficult place to analyze and deploy these strategies because of the complex interactions among vehicles. Vehicle connectivity is an emerging technology that could potentially make eco-driving easier to study on these merge points. This study explores an eco-driving strategy for connected automated vehicles (CAVs) interacting with merging connected truck platoons.

To develop the eco-driving strategy for the CAVs, an optimal control function is developed to model vehicles merging dynamics factoring their energy consumption. The strategy is an acceleration-based eco-driving model that minimizes energy usage as the vehicle encounters the truck platoon and changes its dynamics. The Intelligent Driver Model (IDM) is used if the CAV decides to follow the truck platoon. Trucks and CAV in this model are assumed to be electric vehicles and follow their respective electricity consumption function for their vehicle types.A simulation is conducted that randomly generates truck platoons merging onto the highway and CAVs traveling on the same highway. The CAVs will make one of the following four decisions at the merging point: (i) deaccelerate and allow the truck platoon to move ahead, (ii) accelerate and move ahead of the truck platoon, (iii) move into passing lane at constant acceleration, or (iv) remain at cruising velocity (regardless of truck platoon position). The simulation is run at different traffic densities.The research is ongoing. Based on the preliminary research results, the eco-driving strategy can reduce up to 43% in energy consumption for a CAV platoon. Further research would involve mixing fuel types (gasoline and electric vehicles) in the simulation and studying the impact of platoon formations in the CAVs traveling on the highway.

A Comparative Energy and Economic Analysis of Last Mile Distribution Modes

Robert DeDomenico
Founder and CEO, CargoFish

Energy efficiency for freight transport is lowest for last mile distribution. Specific energy intensity for a 34 mpg automobile shopping trip for 20 pounds of groceries is 340,000 BTU/ton-mile of net payload. Worse, the average net payload of convenience store purchases is 2 pounds, and there are 3x as many convenience store transactions as supermarket. A thorough comparative technical and economic analysis of specific energy and cost intensities across all of the existing freight transportation modes, including also every developing and proposed mode, is detailed in the body. Data from numerous sources including, but not limited to the US Bureau of Transportation Statistics, on rail freight, trucking, pipelines, inland water transport, air freight, parcel post, courier services, marine freight, conveyor belts, material handling systems, bicycle delivery services, pneumatic transport systems, drone delivery, autonomous sidewalk bots, crowd sourced delivery services, ordinary mail, and personal transport including ordinary and electric cars, motorcycles, mopeds, walking, and scooters have been collected, collated, and distilled into salient fundamental energy and cost intensities. An alternative system of enclosed, rail based, electrified utility transport has been modeled and measured for all conceivable performance parameters including energy intensity, and economic viability. In conclusion, the best possibility of high energy efficiency, safety, convenience, and economy, as well as reduction of congestion and emissions, the most promising approach is that of a “containerized parcel” delivery utility system. Much as containerized freight has proven more economical and efficient than break bulk shipping, a distribution utility system designed for secure material handling across any residential neighborhood or campus could achieve specific energy intensities for individually dispatched ten pound payloads of less than 2000 BTU/ton-mile, and be far more economical at the same time. The most commonly observed objections to such an approach are also addressed in light of the preceding analysis.

Bringing Dynamic Message Sign Information Into Vehicles

Robert L. Gordon
President, ALMAGuide, LLC

Charles Ardilio
Business Development & Marketing, ALMAGuide, LLC

Dynamic message signs (DMS) have been a mainstay of ITS field devices for many years. They may nevertheless have the following shortcomings.

- Cost may limit the number of DMS that may be deployed in a region.
- Legibility – The physical size of the DMS letters combined with the message content may make it difficult for the motorist to read and understand the message.
- Reachability – Physical limitations limit the number of motorists within sight of the DMS viewing range. Motorists hat may potentially profit from the information may not be within the DMS viewing range.
- Informability. – It may not be possible to provide the full intent of the he message in the limited space available.

The enhanced traffic sign messaging system (ETSIMS Lite) addresses these issues. ETSIMS Light provides the motorist with DMS messages in the vehicle. Communication to the vehicle and presentation in the vehicle may be made by a hands-free cell phone or a head up display for suitably equipped vehicles.

A catchment domain is defined for each DMS. The DMS message is provided to the vehicles that lie within the catchment domain and that are headed in the appropriate direction. Vehicles may lie within the catchment domains of more than one DMS, thus multiple messages may be provided to the motorist. Furthermore, ETSIMS Lite introduces the concept of the Pseudo DMS (a non-physical DMS whose messages may be defined by the operator.) ETSIMS Lite limits the total number of messages According to a priority structure to a value that is safe.

Forecasting E-Scooter Competition With Direct and Access Trips by Mode and Distance in New York City

Mina Lee
Graduate Student Researcher, Department of Computer Science and Engineering;

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New York University, C2SMART University Transportation Center

Given the lack of demand forecasting models for e-scooter sharing systems, we address this research gap using data from Portland, OR, and New York City. A log-log regression model is estimated for e-scooter trips based on user age, income, labor force participation, and health insurance coverage, with an adjusted R squared value of 0.663. When applied to the Manhattan market, the model predicts 66K daily e-scooter trips, which would translate to 67 million USD in annual revenue (based on average 12-minute trips and historical fare pricing models). We propose a novel nonlinear, multifactor model to break down the number of daily trips by the alternate modes of transportation that they would likely substitute. The final model parameters reveal a relationship with taxi trips as well as access/egress trips with public transit in Manhattan. Our model estimates that e-scooters would replace at most 1% of taxi trips; the model can explain $800,000 of the annual revenue from this competition. The distance structure of revenue from access/egress trips is found to differ significantly from that of substituted taxi trips.

Transportation Safety Technology Initiatives Focusing on Defensive and Universal Design

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Safety design in transportation may include geometric design; evaluating the infrastructure assets, vehicles, and individual users within a system; or incorporation and promotion of quality, cost-effective planning and processes. The United States Department of Transportation (USDOT) identifies safety as its preeminent priority, but the path to determining and achieving results is increasingly challenging in a multimodal environment. Measurements of success may include reduction in fatalities and injury rates or safety audits demonstrating increased regulatory compliance. However, strictly quantitative metrics may fail to consider the natural and human environment contexts for transportation safety. For example, the accommodation of people with mental health disabilities in transportation safety design is often overlooked. The human behavior in human environment is critical for transportation, which mitigation of errors can be investigated through defensive and universal design. Tools and machines as transportation technology approach to help solve problems and improve conditions to move people and goods is present in defensive and universal design. Defensive design takes advantage of technology putting into practice elements and enhancements to planning for contingencies in the design stage of projects or while undertaking it, including anticipating all possible ways that an end-user could misuse a device or asset. Thus it makes it impossible to be misused, or to minimize negative consequences. On the other hand, universal design strategy considers products, environments, operational systems and services in transportation, and has evolved into features already present on autonomous vehicles. While universal design is an existing feature within disabilities policy, adjusting defensive design features for users including travelers needing to find their way on unfamiliar environment, requires approaches that have yet to embrace solutions for mental disabilities in transportation. This paper advances the state-of-the-art of defensive and universal design features for transportation safety technology including mental health conditions for reviewing practice.

Air Taxi Skyport Location Problem for Airport Access

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Air taxis are poised to be an additional mode of transportation in major cities suffering from ground transportation congestion. Among several potential applications of air taxis, we focus on their use within a city to transport passengers to nearby airports. Specifically, we consider the problem of determining optimal locations for skyports (enabling pick-up of passengers to airport) within a city. Our approach is inspired from hub location problems, and our proposed method optimizes for aggregate travel time to multiple airports while satisfying the demand (trips to airports) either via (i) ground transportation to skyport followed by an air taxi to the airport, or (ii) direct ground transportation to the airport. The number of skyports is a constraint, and the decision to go via the skyport versus direct ground transportation is a variable in the optimization problem. Extensive experiments on publicly available airport trips data from New York City (NYC) show the efficacy of our optimization method implemented using Gurobi. In addition, we share insightful results based on the NYC data set on how ground transportation congestion can impact the demand and service efficiency in such skyports; this emerges as yet another factor in deciding the optimal number of skyports and their locations for a given city.

Transit Network Design Problem (Transit-ND) - Impact on Network Travel Time Using a Transportation Planning Model (TPM)

Patricio Vicuna F.,
City College of New York / University Transportation Research Center Region 2;
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This study presents a methodology to analyze the impact of various types of transit lines (Bus, Tram, Light Rail, Heavy Rail) using as a tool the traditional four-step transportation planning model (Trip Generation, Trip Distribution, Modal Split and Traffic Assignment) by employing the corresponding macroscopic software and estimating the corresponding Network Travel Time (NTT). We define a candidate project as a subset or case of Bus lines, Tram lines, Light Rail lines, Heavy Rail lines. It was designed a complete evaluation enumeration and random sampling for different number of transit project selection. A complete evaluation enumeration is conducted for the cases of 1, 2 and 35, 36 out of 37 candidate projects for the Halle network and correspondingly for the cases of 1, 2 and 46, 47 out of 48 candidate projects for the Karlsruhe network. For the remaining combinations for cases of 3,...,34 out of 37 candidate projects for the Halle network and?? correspondingly for the cases of 3,...,45 out of 48 candidate projects for the Karlsruhe network a random sample of 100 candidate projects was selected for each network. In addition, a sensitivity analysis is conducted on the impact of a demand increase by 20, 40, 60 and 80%, respectively for each test network. The results provide insights on the frequency of each candidate project into the best solution (highest impact on the network travel time) ??? based on complete enumeration and sampling; the impact of transit based on each candidate project combination; the maximum potential impact on NTT. This analysis forms the basis for a forthcoming comparative analysis on the use of metaheuristics to solve this specific version of the Transit Network Design Problem (Transit-NDP), while recognizing that the NTT is only one parameter of the Overall Transit-NDP.

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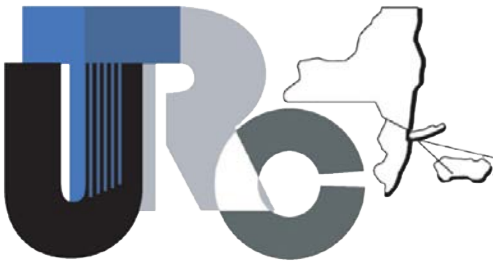

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