

UNIVERSITY  
TRANSPORTATION  
RESEARCH CENTER  
REGION II



WINTER  
2018

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# HIGHLIGHTS

## NYSERDA AWARDS

UTRC faculty researchers from the City College of New York received two NYSERDA Awards.

1

### DEMONSTRATION OF VIRTUAL TRANSPORTATION MANAGEMENT STRATEGIES FOR SMART CITIES IN NY

**Principal Investigator(s):** Dr. Camille Kamga

**Performing Institution:** The City College of New York, CUNY

**Sponsor(s):** New York State Energy Research and Development Authority (NYSERDA)

New York State Department of Transportation (NYSDOT)  
University Transportation Research Center (UTRC)

This study's goal is to effectively demonstrate the deployment of under utilized strategies and technologies to reduce congestion, and as a result, energy consumption, on the local roadway system in Mount Vernon. To do so, the study will include the demonstration of under utilized strategies and policies related to advanced traffic management and integrated corridor management. In both locations, the team will work closely with local officials to identify a signalized corridor that would be suitable to conduct this study and will also develop the important performance measures that will be used to define the effectiveness of the project.

The City of Mount Vernon, located about 13 miles north of Manhattan, encompasses 4.4 square miles and is home to almost 69,000 residents (according to 2010 U.S. Census numbers).

As a small city, it experiences issues related to heavy congestion, but lacks access to intelligent transportation technologies. Therefore, there is a need for the demonstration of an effective strategy to deploy advanced transportation management systems (ATMS). After corridor selection, the team will deploy wireless communication technologies, dynamic video detection and monitoring units, and a cloud-based ATMS solution. Wi-Fi and/or Bluetooth readers and environmental sensors will also be installed throughout the corridor so that performance measures and reduction of transportation GHGs/energy consumption can be validated.

One of the key elements of this demonstration will be the remote monitoring or the "virtual management" of the corridor. Since the ATMS technologies are managed through either a central software or direct IP address, they are accessible from anywhere that has an internet connection. Utilizing the FHWA's "Guidelines for Virtual Transportation Management Center Development," the researchers will remotely monitor the overall "health" of the signal system. Connecting remotely to the transportation infrastructure assets along the corridor, the researchers will assist in oversight, troubleshooting equipment issues, mitigating congestion conditions and improving operations. As an example, traffic flow will be assessed through the corridor by uploading traffic count data collected by the field devices and analyzing that data to provide better progression along the corridor.

2

### CONNECTED, AUTONOMOUS, AND SHARED VEHICLE IMPACTS STUDY

**Principal Investigator(s):** Dr. Camille Kamga

**Performing Institution:** The City College of New York, CUNY

National Renewable Energy Laboratory (NREL)

**Sponsor(s):** New York State Energy Research and Development Authority (NYSERDA)

New York State Department of Transportation (NYSDOT)  
University Transportation Research Center (UTRC)

Connected and automated vehicles (CAVs) and shared mobility transitions are recognized as having potential to transform energy consumption and mobility dynamics through improved efficiency, better routing, lower traffic congestion, and the enabling of advanced technologies. Use of CAVs, however, can also increase fuel consumption through effects such as longer distances traveled, increased use of transportation to previously less accessible locations and increased trips by underserved populations, as well as increased travel speeds.

The National Renewable Energy Laboratory recently explored the long-term impacts of self-driving vehicles on the nation in terms of projected energy usage (Brown et al, 2014). This early research showed a wide variation of between a -90% and +200% impact in fuel use and greenhouse gas (GHG) emissions, relative to a business as usual case, by 2050. Differences in these results depended on changes in use intensity, energy intensity, or fuel intensity ((Brown et al, 2014.)

The goal of this new study is to perform a state-level CAV energy/GHG impacts assessment in New York. The methodology will be developed under consistent assumptions and be based on well-defined analyses and simulations. To fill a need for this type of analysis on the state level, this project will give an assessment of the potential influence of CAV technologies on the energy use of New York State on-road vehicles to the year 2050 under a range of deployment scenarios. It will provide upper and lower bounds for various future applications of CAV technologies by transportation segment, synthesizing results for many possible deployment scenarios, and using estimates of future changes in vehicle design, vehicle use at a local level, changes in regional travel patterns, and other system effects. This will enable estimate ranges of possible changes in vehicle activity, energy use, and GHG emissions that CAV technologies might produce. The research will be performed with the support of state and local providers such as state and local planners/DOTs, 'Mobility as a Service' providers, transit agencies, and rural-to-urban jurisdictions.

**PROJECT UPDATE:****NYCDOT CONNECTED VEHICLE PILOT TECHNOLOGY INSTALLATION**

UTRC is involved with NYCDOT's Connected Vehicle (CV) Pilot, particularly in the areas of performance measures, stakeholder outreach and staff and participant training. As part of the project's outreach activities, UTRC has developed a video, prepared written materials such as articles for NYCDOT's newsletter, and social media posts about the project. Training will be provided to a number of different groups, including installers of the CV technology and drivers of the vehicles in which this technology is installed. UTRC is providing videos and other educational materials for this training effort.

This USDOT-sponsored project focuses on road safety and it will not only evaluate how this technology performs in a dense urban transportation network, but will also help NYC move closer to reaching the Vision Zero goal of eliminating fatalities and injuries caused by traffic accidents. The project is progressing through its second phase which consists of designing, building, and testing CV wireless devices, mobile devices, and roadside infrastructure.

The Pilot has begun the installation of aftermarket safety devices (ASD) and roadside units (RSU), which are the main components of CV technology. The ASDs are installed in vehicles and allow them to communicate with other vehicles (vehicle to vehicle or V2V communication) and the RSUs are installed in transportation infrastructure at intersections and communicate with vehicles (vehicle to infrastructure and infrastructure to vehicle or V2I/ I2V communication).

The installation process will begin with prototype testing which will be done in two phases. The first will test V2V communications between ASDs and the second will test V2I/I2V communications between RSUs and ASDs. This testing has two main objectives: 1) to identify and resolve any issues with installing ASDs in vehicles and RSUs in existing NYCDOT equipment at intersections and 2) to finalize the specifications for these components. Between 80 and 100 prototype ASDs will be provided for V2V testing and plans are underway for ten intersections to be outfitted with RSUs so that V2I/I2V communications between ASDs in vehicles and the RSUs can be tested during the spring of 2018. At the end of this test period, the production and installation of up to 8,000 ASDs and 400 RSUs will commence.

For more information about the project and connected vehicle technology, visit <http://www.cvp.nyc>

## **STUDENT SPOTLIGHT**

### **27<sup>TH</sup> ANNUAL OUTSTANDING STUDENT OF THE YEAR AWARD WINNER FROM REGION II: STEFAN POUGATCHEV, NEW YORK INSTITUTE OF TECHNOLOGY (NYIT) AT THE AT THE 97<sup>TH</sup> TRANSPORTATION RESEARCH BOARD (TRB) MEETING**

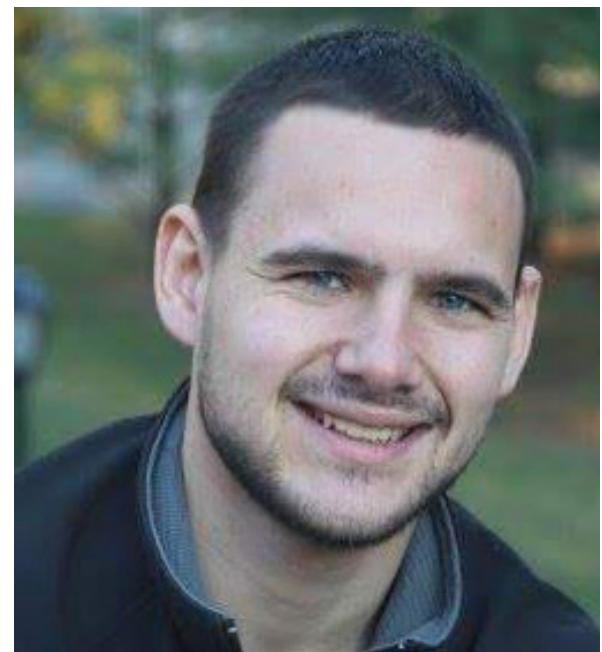
For the year 2018, the Council of University Transportation Centers (CUTC) has selected Mr. Stefan Pougatchev, a New York Institute of Technology (NYIT) student from Region 2, as the 27th CUTC outstanding student of the year (Sponsored by the U.S. Department of Transportation (U.S. DOT) and administered by the Office of the Assistant Secretary for Research and Technology (OST-R)). The CUTC Banquet awards were held on Saturday, January 6<sup>th</sup> in Washington during the TRB Annual Meeting.

Stefan Pougatchev completed a bachelor of science degree in electrical engineering technology in 2016 at the New York Institute of Technology (NYIT). He is currently a graduate student at NYIT, pursuing a master's degree in energy management. Stefan's main passions are robotics, renewable energy, and STEM education. During his undergraduate career, Stefan participated in multiple robotics competitions by the NYIT IEEE chapter and was a mentor for Calculus 1 and 2. Stefan also interned for Con Edison, Inc., where he monitored network transformers for potential failures. In addition to his work experience, Stefan started a robotics camp (Engineerify), offering a robotics summer camp for children in elementary to high school.

Stefan has received his master of science degree in December 2017 and will pursue his studies for a Ph.d. His research areas include electric bus systems, light rail systems, car and bike sharing programs.

Stefan was also UTRC's AITE scholarship recipient because of his service in supporting STEM education, not only by mentoring fellow students but also by attracting and inspiring the next generation to pursue STEM fields. (E.g., via a STEM/robotics summer camp).

His thesis titled, **Transportation Study of the Nassau Hub**, focuses on the Nassau Hub Transportation Study. His research concentrates on implementing a car and bike sharing program within the study area of Nassau County, Long Island, NY. In addition, he is preparing a report that includes strategies for reducing carbon emissions and traffic congestion while improving transportation within the hub.



**CUTC, established in 1979, works to advance the state-of-the-art in all modes and disciplines of transportation. Its membership consists of 93 of the nation's leading university-based transportation centers. The event was held in conjunction with the Transportation Research Board's (TRB) 97<sup>th</sup> annual meeting.**

**PROJECT SPOTLIGHT****UTRC RESEARCHERS COMPLETED THE NYSERDA/NYS DOT SPONSORED RESEARCH: REDUCING INCIDENT-INDUCED EMISSIONS AND ENERGY USE IN TRANSPORTATION: USE OF SOCIAL MEDIA FEEDS AS AN INCIDENT MANAGEMENT SUPPORT TOOL**

**Principal Investigator(s):** Dr. Camille Kamga,  
**Co-PI:** Dr. Anil Yazici, SUNY-Stony Brook

**Co-Authors:** Dr. Sandeep Mudigonda, CCNY, and  
Seyedamirmasoud Almotahari, SUNY-Stony Brook

**Performing Institution(s):** The City College of New York, CUNY  
Stony Brook - The State University of New York (SUNY)

**Sponsor(s):** New York State Energy Research and  
Development Authority (NYSERDA)  
New York State Department of Transportation (NYS DOT)  
University Transportation Research Center (UTRC)

**PROJECT'S ABSTRACT:**

Ubiquitous connected devices and microblogging platforms, such as Twitter, are providing a huge amount user-generated information that has a great potential for applications in transportation incident management (TIM) with minimal infrastructure required. In this study publicly posted Twitter posts were gathered using relevant keywords. While organizational Twitter accounts (e.g., DOT, news outlets) disseminate traffic information after an incident is reported and confirmed, tweets of personal accounts are more likely to contain previously unreported traffic information, and therefore are particularly valuable for TIM. A variety of information such as location, time,

severity, extent of damage, presence of debris, and evolution of congestion can be extracted from the Twitter's text. Such information is especially useful for TIM as the traditional sources for gathering traffic information, such as loop detectors and sensors, are expensive to construct and maintain for local and rural roads. Accident delay as well as emissions and fuel consumption were calculated using comprehensive incident data from California Highway Patrol to demonstrate the benefits of using Twitter for TIM. As a result of the early detection, 4,046 vehicle-hours of delay savings, reduction in 5.9 kg of ROG, 133 kg of CO, 16.3 kg of NOx and 0.3 kg of PM 2.5 and 1,939 gal of gasoline and 622 gal of diesel were estimated to be saved – total monetary value of \$75,600 i.e., \$0.5 per mile per week in California. For incidents in NYS, for each accident recorded, accident delay as well as emissions and fuel consumption were estimated in order to benchmark the potential delay and savings due to early incident detection. The study concludes with recommendations for the application of social media for TIM.

To access the full report, please visit the project's webpage at:  
<http://www.utrc2.org/research/projects/reducing-incident-induced-emissions-and-energy>

 Video Briefing  
On the UTRC  
Funded Project

## Reducing Incident-Induced Emissions and Energy Use in Transportation:

Use of Social Media Feeds as an Incident Management Support Tool

### Project Co-PI

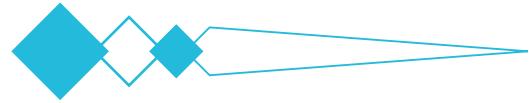


**M. Anil Yazici, Ph.D.**  
Civil Engineering

Stony Brook University



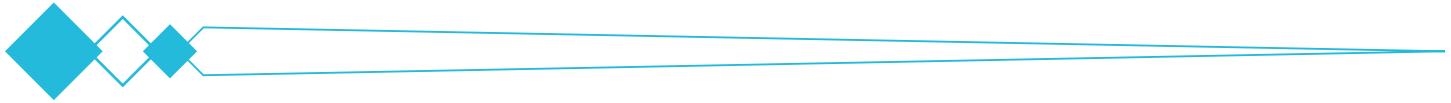
**vimeo**



## Dr. Thomas H. Wakeman III

Deputy Director of the Davidson Laboratory  
Research Professor in the Department of Civil,  
Environmental, and Ocean Engineering  
Stevens Institute of Technology





Thomas Wakeman joined Stevens Institute of Technology, Hoboken, New Jersey in 2007. He is currently the Deputy Director of the Davidson Laboratory and Research Professor in the Department of Civil, Environmental, and Ocean Engineering. Previously at Stevens, Dr. Wakeman was the Deputy Director of the Department of Homeland Security's National Center of Excellence for Port Security. Earlier employment included working for the Port Authority of New York and New Jersey for 13 years (in positions including General Manager, Waterways Development and Regional Strategic Planning Manager) and working for the U.S. Army Corps of Engineers, San Francisco and Sacramento Districts, California for 24 years (including as a Supervisory Civil Engineer, Research Hydraulic Engineer, Project/Program Manager, and Technical Director, Bay/Delta Hydraulic Model). His academic degrees include Master of Science in Civil and Environmental Engineering, University of California, Davis, Master of Arts, Marine Biology, San Francisco State University, California, and Doctorate of Engineering-Science

Dr. Wakeman' current research interests are: Port Performance Freight Statistics: Dr. Wakeman was appointed a Special Government Employee within the U.S. Department of Transportation/Bureau of Transportation Statistics (BTS), as Chairman of the Port Performance Freight Statistics Working Group. The group was formed under Section 6018, Public Law 114-94, Dec. 4, 2015 (FAST Act), for a 2-year term from March 2016 to March 2018. The Working Group met to research and to develop metrics to help manage import, export, and domestic freight mobility through seaports. A Letter Report was sent to the BTS Director with recommendations in January 2017 for their consideration and use in a report to Congress. Subsequent reports to the BTS Director by the Working Group are to be determined by Congress.

### **Resilience and Sustainability:**

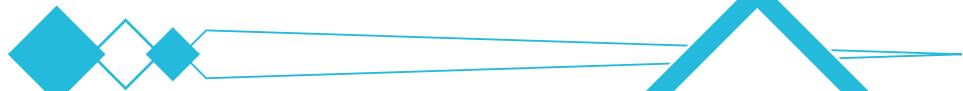
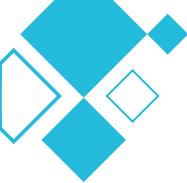
There are several aspects in common between disaster resilience and infrastructure sustainability. There are also distinct differences in these practices. Dr. Wakeman has been exploring the commonalities, differences and relationships among risk analysis, resilience, and sustainability recently presented a webinar for the American Society of Civil Engineers (ASCE). He working as part of the Infrastructure Resilience Division (IRD) and with other ASCE committee members (including the Committee on Climate Change and the Committee on Sustainability) to deliver technical white paper(s) in 2018.

Dr. Wakeman is a National Associate of the National Academies of Science, Engineering and Medicine, holds a Fellow grade with both the American Society of Civil Engineers (ASCE) and the World Association for Waterborne Transport Infrastructure (PIANC), U.S. Section. He has held multiple leadership positions with the Transportation Research Board, including most recently as the Chairman of the Transportation System Resilience Section. His publications include more than one hundred technical articles, three book chapters, and co-author/editor of three books.

### **His UTRC, Region II publications are:**

Wakeman, T., Miller, J. and Python, G. 2015. Port Resilience: Overcoming Threats to Maritime Infrastructure and Operations from Climate Change, University Transportation Research Center (UTRC), Region II, Technical Report Series, City University of New York, New York. 32 p. (<http://www.utrc2.org/publications/port-resilience-overcoming-threats-maritime-infrastructure>)

Wakeman, T., and J. Miller. 2013. Lessons learned from Hurricane Sandy for port resilience. University Transportation Research Center (UTRC), Region II, Technical Report Series, City University of New York, New York. 59 p. (<http://www.utrc2.org/publications/hurricane-sandy-port-resilience>)



## Completed Research Projects

**UTRC  
SPONSORED  
PROJECTS**

### **TRANSPORTATION INFRASTRUCTURE ROBUSTNESS JOINT ENGINEERING AND ECONOMIC ANALYSIS**

**Principal Investigator(s):** Joseph Berechman, Ph.D, Michel Ghosn, Ph.D

**Institution(s):** City University of New York (CUNY)

**Sponsor(s):** University Transportation Research Center (UTRC)

The objectives of this study are to develop a methodology for assessing the robustness of transportation infrastructure facilities and assess the effect of damage to such facilities on travel demand and the facilities users' welfare. The robustness of transportation facilities is related to two types of damage: a) longitudinal deterioration in facility engineering quality; and b) sudden shock due to unexpected extreme events. This study focuses on the first determinant and its economic implications. Achieving the stated objectives requires reviewing the basic principles of infrastructure durability, modeling the relation between travel demand and infrastructure damage, and analyzing users' economic welfare

Access the full report at:

<http://www.utrc2.org/sites/default/files/Final-Report-Transportation-Infrastructure-Robustness.pdf>

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### **DO CONSUMER EXPENDITURES AFFECT THE DEMAND FOR DRIVING?**

**Principal Investigator(s):** Michael Manville, Michael Smart, David King

**Institution(s):** Cornell University

**Sponsor(s):** University Transportation Research Center (UTRC)

We examine why American driving fell between 2004 and 2014, and consider how planners should respond. We weigh two competing explanations: that the driving downturn was caused by "Peak Car" - a voluntary shift away from driving, and that it was caused by economic hardship. We analyze an array of aggregate data on travel, incomes, debt, public opinion and Internet access. These data are imperfect, as they lack the precision of microdata, but they are available annually for the years before during, and after driving's decline. We find little evidence supporting Peak Car. If Americans voluntarily drove less, they should have used other modes more. However, even as the US dramatically expanded its supply of public transportation and bicycle infrastructure in the 2000s, demand for these modes remained flat or declined while driving fell. Our evidence is consistent, in contrast, with the economic explanation.

Access the full report at:

<http://www.utrc2.org/sites/default/files/Final-Report-Do-Consumer-Expenditures-Affect-Demand.pdf>

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### **BAYESIAN MULTILEVEL MODELS FOR RIDERSHIP DEMAND USING RAINFALL**

**Principal Investigator(s):** Naresh Devineni, Ph.D, Mahdieh Allahviranloo, Ph.D

**Institution(s):** City University of New York (CUNY)

**Sponsor(s):** University Transportation Research Center (UTRC)

The Northeast United States, particularly New York State has experienced an increase in extreme 24-hour precipitation during the past 50 years (Horton et al., 2011). Recent events such as Hurricane Irene and Superstorm Sandy have revealed vulnerability to intense precipitation within the transportation sector. Stronger knowledge of extreme events and the resultant simultaneous regional network vulnerabilities can support emergency management division in creating more effective response systems. There is a necessity to understand the underlying reasons that generate the spatial-temporal demand. There is also a necessity to understand and forecast, based on climate, individual level behavior and their nodal functions during a simultaneous extreme rainfall event.

Access the full report at:

<http://www.utrc2.org/sites/default/files/Final-Report-Bayesian-Multilevel-Models.pdf>



## **STREETCAR PROJECTS AS SPATIAL PLANNING: A SHIFT IN TRANSPORT PLANNING IN THE UNITED STATES**

**Principal Investigator(s):** David King

**Institution(s):** Columbia University

**Sponsor(s):** University Transportation Research Center (UTRC)

Currently dozens of U.S. cities are in the midst of planning and building modern streetcar systems. Though seemingly mobility investments, the intended impacts of these streetcar projects reach beyond transportation and represent a strong turn toward strategic spatial planning through transportation infrastructure. Proponents of modern streetcars argue that they are tools of place making as much as if not more than improvements for transit services. Unlike transit investments of a century ago, when privately operated streetcars were a decentralizing force that helped disperse overcrowded central city cores and open new land for real estate development, current streetcar projects in the United States are expected to concentrate activity and economic development in select corridors. The majority of these new systems rely on transit technologies that are significantly improved over the carriages of old, with modern features, smooth rides and quiet operations. Yet for all the improvements to the vehicles and services, new streetcar investments no longer primarily improve transit accessibility.

Access the full report at:

<http://www.utrc2.org/sites/default/files/Final-Report-Streetcar-Projects-Spatial-Planning.pdf>

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## **LOCATING PORTABLE STATIONS TO SUPPORT THE OPERATION OF BIKE SHARING SYSTEMS**

**Principal Investigator(s):** Dr. Jose Walteros

**Institution(s):** State University of New York (SUNY)

**Sponsor(s):** University Transportation Research Center (UTRC)

Redistributing bikes has been a major challenge for the daily operation of bike sharing system around the world. Existing literature explore solution strategies that rely on pick-up-and-delivery routing as well as user incentivization approaches. The key contribution of this work is to introduce the use of portable bike stations to augment the capacity of fixed stations in the context of redistribution. A comprehensive framework to optimally locate, route and redistribute bike using portable stations is proposed using a sequence of Mixed Integer Programs. This strategic and operational decision making process is modeled in two stages. A decomposition based solution strategy is used to solve and fix the strategic decisions.

Access the full report at:

<http://www.utrc2.org/sites/default/files/Final-Report-Locating-Portable-Stations.pdf>

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## **INFERRING HIGH-RESOLUTION INDIVIDUAL'S ACTIVITY AND TRIP PURPOSES WITH THE FUSION OF SOCIAL MEDIA, LAND USE AND CONNECTED VEHICLE TRAJECTORIES**

**Principal Investigator(s):** Dr. Qing He

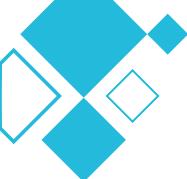
**Institution(s):** State University of New York (SUNY)

**Sponsor(s):** University Transportation Research Center (UTRC)

Trip purpose is crucial to travel behavior modeling and travel demand estimation for transportation planning and investment decisions. However, the spatial-temporal complexity of human activities makes the prediction of trip purpose a challenging problem. With the increasing advance of the Information Communication Technology (ICT), tremendous social media data becomes available. The goal of this report is to model and predict trip purpose with social media data.

Access the full report at:

<http://www.utrc2.org/sites/default/files/Final-Report-Inferring-High-Resolution.pdf>

**SIMULATION OF AUTOMATED VEHICLES' DRIVE CYCLES**

**Principal Investigator(s):** Scott LeVine

**Institution(s):** State University of New York (SUNY)

**Sponsor(s):** University Transportation Research Center (UTRC)

This research has two objectives:

1. To develop algorithms for plausible and legally-justifiable freeway car-following and arterial-street gap acceptance driving behavior for AVs
2. To implement these algorithms on a representative road network, in order to generate representative drive cycles for AVs that are both theoretically-grounded and based on empirical driving conditions.

The theory underpinning the colloquial concept of defensive driving is known as Assured Clear Distance Ahead. ACDA-compliant driving strategies were initially implemented for AVs (in the specific context of queue discharge at signalized intersections) in research recently undertaken by the study team. This research focused on two contexts: freeway 'pipeline' and intersection-turning-movements.

Access the full report at:

<http://www.utrc2.org/sites/default/files/Final-Report-Simulation-of-Automated-Vehicles-Drive-Cycles.pdf>

**IMPACT OF OPTIMIZATION STRATEGY AND ADOPTION RATE OF V2X TECHNOLOGY IN ENVIRONMENTAL IMPACT**

**Principal Investigator(s):** Dr. Katie McConky

**Institution(s):** Rochester Institute of Technology

**Sponsor(s):** University Transportation Research Center (UTRC)

This research evaluated the effects of automated vehicle control strategies on system level emissions, travel time and wait time through a series of traffic lights. The study was conducted using traffic simulation and a realistic vehicle mix. Two control strategies were evaluated including a single vehicle control strategy and a multi-vehicle coordination heuristic. The performance of each control strategy was recorded under various levels of connected and autonomous vehicle technology (V2X technology) and 3 levels of traffic flow.

Access the full report at:

<http://www.utrc2.org/sites/default/files/Final-Report-Impact-of-Optimization-Strategy-V2X.pdf>



# NEWS FROM UTRC CONSORTIUM UNIVERSITIES



## THE LIGHTING RESEARCH CENTER (LRC)

### LRC/UTRC Research Featured at the 2018 TRB Annual Meeting

Dr. John Bullough, Director of the Lighting Research Center (LRC) Transportation and Safety Lighting Programs at Rensselaer Polytechnic Institute, was a co-author of two Transportation Research Board (TRB) Annual Meeting posters in January 2018 featuring projects conducted by the LRC through the University Transportation Research Center (UTRC). One, "Analysis of Energy Efficient Highway Lighting Retrofits," sponsored by the New York State Department of Transportation (NYSDOT), was featured at the American Association of State Highway and Transportation Officials (AASHTO) session showcasing the "Sweet Sixteen" selection of high-value research projects conducted by state transportation departments. The other, "Optimizing Work Zone Lighting," was co-presented with Mamun Rashid of the New Jersey Department of Transportation (NJDOT) and was included in a session featuring high-value maintenance and safety research.

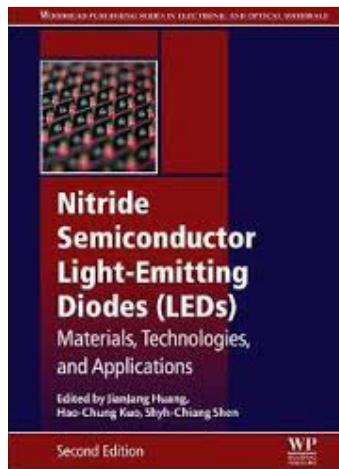


Additionally, Dr. Bullough, who is completing his second three-year term as chair of the TRB's Committee on Visibility in 2018, presented a paper co-authored by Xiang Liu entitled "Luminance Measurement and Visual Performance Analyses of Raised Pavement Markers," sponsored by the New Jersey Department of Transportation. He was a co-author of another paper presented at TRB, "Determination of Optimal Intensities and Periods for Vehicle-Mounted Warning Lights using Field Experiments," with Kristin Kersavage, Philip Garvey and Eric Donnell from the Pennsylvania State University and with Nicholas Skinner and Mark Rea of the LRC. Dr. Bullough also moderated the session "Weather-Related Aspects of Visibility" at the TRB Annual Meeting.

Dr. John Bullough was acknowledged for his service as committee chairman by Richard Cunard of TRB

### LRC Publications in 2017-2018

Since September 2017, LRC researchers (denoted by asterisk\*) have authored the following publications:



LRC's Bullough contributed a chapter on LEDs in automotive lighting to the book "Nitride Semiconductor Light-Emitting Diodes" (2nd Edition).

- Bullough, J. D.\* and N. P. Skinner.\* 2017. Real-world demonstrations of novel pedestrian cross-walk lighting. *Transportation Research Record* (2661): 62-68.
- Bullough, J. D.\* 2017. Human factors impacts of light emitting diode airfield lighting. *Transportation Research Record* (2626): 51-57.
- Bullough, J. D.\* 2017. Opinion: Will road lighting wither? *Lighting Research and Technology* 49(6): 672.
- Bullough, J. D.\* 2017. Developing a better understanding of discomfort glare: Cause and effect. 12th International Symposium on Automotive Lighting (pp. 705-714), Darmstadt, Germany, September 25-27. Munich, Germany: Herbert Utz Verlag.
- Bullough, J. D.\* 2017. Spectral considerations for transportation lighting systems. *Frontiers in Optics/Laser Science (FTh3C.4)*, Washington, DC, September 17-21. Washington, DC: Optical Society of America.
- Bullough, J. D.\* N. P. Skinner\* and R. Taranta.\* 2017. Effective Intensity of Multiple-Pulse Flashing Signal Lights, DOT/FAA/TC-17/49. Washington, DC: Federal Aviation Administration.
- Bullough, J. D.\* 2018. LEDs and automotive lighting applications. In *Nitride Semiconductor Light-Emitting Diodes: Materials, Technologies, and Applications*, 2nd edition (pp. 647-658). J.-J. Huang, H.-C. Kuo and S.-C. Shen, editors. Cambridge, UK: Woodhead Publishing.
- Bullough, J. D.\* and N. P. Skinner.\* 2018. High visibility reflective sign sheeting materials: Field and computational evaluations of visual performance. *Transport* 33(2): 344-352.
- Bullough, J. D.\* and X. Liu. 2018. Luminance measurement and visual performance analyses of raised pavement markers. *Transportation Research Board 97th Annual Meeting*, Washington, DC, January 7-11. Washington, DC: Transportation Research Board.
- Kersavage, K., N. P. Skinner\*, J. D. Bullough, P. M. Garvey, E. T. Donnell and M. S. Rea.\* 2018. Determination of optimal intensities and periods for vehicle-mounted warning lights using field experiments. *Transportation Research Board 97th Annual Meeting*, Washington, DC, January 7-11. Washington, DC: Transportation Research Board.

## CITY UNIVERSITY OF NEW YORK (CUNY)

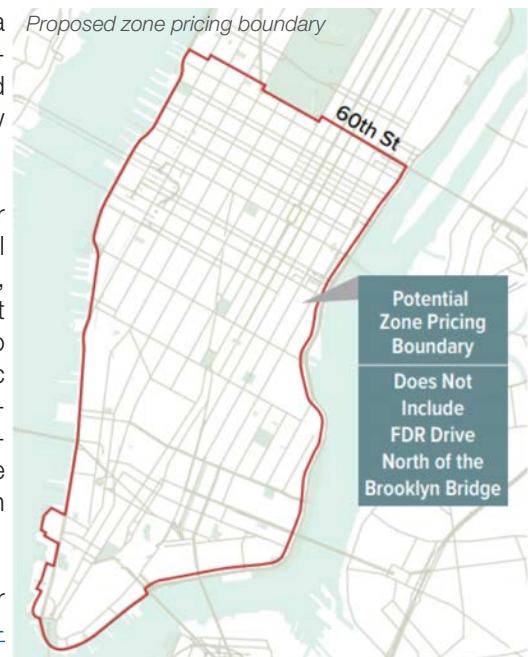
### UTRC/CCNY Distinguished Lecturer; Matthew W. Daus's Featured Articles

#### Manhattan CBD Access Fees for TLC Vehicles: Congestion Pricing or Another MTA Tax?

The traffic gridlock in Manhattan's Central Business District (CBD) has reached a breaking point. There, traffic speed dropped 12% from 2010 to 2015. In 2016, vehicle speeds in the Midtown Core have dropped to 4.7 mph, due in part to the rapid expansion of Uber. A new study has shown that, by 2023, congestion will cost New York City \$100 billion.

Not surprisingly, congestion pricing has become a hot topic once again. In October 2017, New York Governor Andrew Cuomo assembled the Fix NYC Advisory Panel (Fix NYC), which was tasked to address the worsening traffic congestion in the CBD, as well as identify sources of revenue to fix the deteriorating subway system. Last month, Fix NYC's final report was released, and it included recommendations to tackle these issues through a phased approach. Phase One (2018) calls for public transit improvements in the outer boroughs and suburbs, stricter traffic law enforcement, a NYC placard program overhaul, reform of the NYC Taxi and Limousine Commission (TLC) and bus congestion mitigation. Phase 2 (2019) proposes a surcharge for taxis and for-hire vehicles (FHV), and Phase 3 (2020) includes the implementation of a pricing zone within the CBD.

To access the full column authored by Matthew W. Daus, please visit the Black Car News webpage at: <https://www.blackcarnews.com/article/manhattan-cbd-access-fees-for-tlc-vehicles-congestion-pricing-or-another-mta-tax>



#### Medallions on the Auction Block: Interest and Values on the Rise!

It seems like only yesterday that the NYC Taxi & Limousine Commission (TLC) auctioned medallions at sealed-bid competitive auctions in excess of \$1 million per medallion. Following several decades of virtually unimpeded growth, the value of New York City taxi medallions peaked at \$1,259,000 in 2013. On or about November 27, 2014, the open marketplace came to a halt due to investor and lender fear caused by slightly exaggerated drops in ridership reported by the media, with further declines continuing to accrue slowly over time. Liquidity dried-up, and with banks not lending, the market entered a state of hibernation. Non-arms-length transactions were routinely reported, including estate sales, stock swaps, cash buyouts and foreclosure sales, and there has been little consistency to the deals and values reported. Current cash-flow valuations prepared by accountants and economists, that were accepted by banking regulators and bankruptcy courts alike, capture the revenue generating potential of the NYC taxi medallion at anywhere between \$11,000 and \$14,000 per month, and a valuation of anywhere from \$390,000 to \$441,000 for individually owned medallions.

In 2017, the average price for an independent medallion was \$301,773, while the average price for a corporate medallion was \$384,467. As medallion values have declined, some owners who previously obtained financing have found themselves unable to make their monthly payments, though the vast majority can and do. The untold story is that other than one high-profile corporate medallion owner, no reported corporate foreclosures or bankruptcies have hit the marketplace.

To access the full column authored by Matthew W. Daus, please visit the Black Car News webpage at: <https://www.blackcarnews.com/article/medallions-on-the-auction-block-interest-and-values-on-the-rise>



Matthew W. Daus, Esq., former NYC Taxi & Limousine Commissioner / Chairman, welcomes the bidders at the Aspire Federal Credit Union Taxi Medallion Auction on January 16, 2018

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## **CITY UNIVERSITY OF NEW YORK (CUNY)**

### **Dr. James Cohen, City University Professor Emeritus and UTRC Colleague to Present at the LabEx-Sorbonne Seminar on the History of Science and Innovation**

Jim Cohen will be presenting a titled “Theory and history of high speed rail in the U.S., 1930-present.” The lecture is part of a year long “Seminar on the History of Science and Innovation,” at the University of Paris/Sorbonne. The following provides a brief synopsis of the paper:

The paper begins by considering theoretical aspects of “high speed,” including the subjective and material basis of perceiving movement through time and space; the historically relative meaning of high speed; and the intrinsically dialectical nature of high speed. Some of these aspects are then applied as part of providing answers to two important empirical questions: first, how and why did U.S. manufacturers, who were in the forefront of developing high speed train technology from the 1930's to the 1950's, and arguably even into the 1970's, subsequently become dependent on French, Japanese, and other foreign technology? Second, what caused the repeated failure of the many attempts to implement very high speed rail lines in the U.S. between 1980 and the present? The second question is answered through a case study of Florida. The paper concludes with a comparison of the relative merits of developing moderate and very speed lines in the U.S.

Jim Cohen (Professor Emeritus, The City University) will have an article published in June by the Review of Railway History, the pre-eminent French railway historical journal. The article is titled “The political economy of high speed rail in Florida, 1981-present (a case study).” It will appear in a special issue of the journal concerned with the politics and financing of major infrastructure projects, such as the Channel Tunnel and very high speed rail lines.

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## **NEWS FROM NEW YORK UNIVERSITY**

### **Dr. Rae Zimmerman's Recent Publications and White Papers:**

R. Zimmerman and M. G. Dinning, “Benefits and Needs for an Integrated Approach to Cyber-Physical Security for Transportation,” In Transportation Systems Resilience: Preparation, Recovery, and Adaptation, Transportation Research Circular E-226, Transportation Research Board, November 2017 pp. 15-21. <http://onlinepubs.trb.org/onlinepubs/circulars/ec226.pdf>

R. Zimmerman, “The Transit-Jobs Nexus: Insights for Transit-Oriented Development,” Fordham Urban Law Journal, Vol. XLIV, No. 4, August 2017, pp. 1131-1152. <http://ir.lawnet.fordham.edu/ulj/vol44/iss4/8>

White Paper. R. Zimmerman, “The Cyber and Critical Infrastructures Nexus: Interdependencies, Dependencies and Their Impacts on Public Services,” White Paper, NYU Center for Cybersecurity, December 2017. <http://cyber.nyu.edu/wp-content/uploads/2017/12/Zimmerman-122717updateEdited-White-Paper-Cyber-and-Critical-Infrastructures.pdf>

### **Dr. Rae Zimmerman's Conference Presentations (occurred):**

January 30, 2018. R. Zimmerman, Invited presenter, “New York Energy Transition in the Context of Recent Hurricanes,” Workshop on Deploying Sustainable Energy during Transition: Implications of Recovery, Renewal, and Rebuilding, National Academies of Sciences, Engineering, and Medicine, Roundtable on Science and Technology for Sustainability (STS Round-table), National Academies’ Science and Technology for Sustainability Program. [http://sites.nationalacademies.org/PGA/sustainability/pga\\_183697](http://sites.nationalacademies.org/PGA/sustainability/pga_183697)

December 10-14, 2017. R. Zimmerman, “Risk reduction assessment of innovative solutions to interdependent cascading infrastructure failures.” Society for Risk Analysis annual meeting, Arlington, VA. <http://www.sra.org/2017-annual-meeting>

November 30, 2017. R. Zimmerman, Invited speaker, “Water, Power, Telecommunications: Disasters and Critical Infrastructure Interdependencies” John Jay College Christian Regenhard Center for Emergency Response Studies (RaCERS), New York, NY.

November 17, 2017. R. Zimmerman, Invited speaker, “Managing Weather, Climate and Other Disasters and Emergencies,” presentation to the Guangdong, China Delegation of Government Leaders hosted by Georgetown University, Georgetown



Global Education Institute Executive Education Program on "Improving Governing Capability," New York, NY. October 27, 2017. R. Zimmerman, "(589933) Understanding and Reducing Catastrophic Intersections of Public Infrastructure Services and Their Interconnections, Climate Change, and Extreme Weather Events," ASCE International Conference on Infrastructure Sustainability, in the panel, "Case Study-PANYNJ" <http://www.icsconference.org/>

October 26, 2017. R. Zimmerman, "(419183) Financing Sustainable Infrastructure: Reconciling Disaster and Traditional Financial Resources;" ASCE International Conference on Infrastructure Sustainability, Presenter and Moderator of Finance panel. <http://www.icsconference.org/>

October 12-15, 2017. R. Zimmerman, "Frameworks for the compatibility of traditional and green infrastructures in urban contexts," Association of Collegiate Schools of Planning Annual Conference, Denver, CO. <http://www.acsp.org/?page=ConfACSP>

## Presentations (upcoming, accepted)

April 10, 2018. R. Zimmerman, "Financial Investments for Infrastructure Reilience as Potentially Influencing Insurance Related to Extreme Events", Association of American Geographers, Panel on Financializing Urban Resilience: Insurance, Reinsurance and Post-Disaster Reconstruction in Urban Areas, New Orleans, LA.

May 1-2, 2018. R. Zimmerman, "Greening Infrastructure Finance for Sustainable Infrastructure Innovations," International Conference on Sustainable Cities, Columbia-Fordham-NYU, New York, NY.

June 11-13, 2018. R. Zimmerman, "Historical and Anticipated Changes in Infrastructure and Social System Interconnected Networks in the Context of Weather and Climate Extremes." Conference on The Second Interdisciplinary Perspectives on Urban Infrastructure Hisdtoty and the Social Sciences, Venice, Italy.

## Professional appointments (new):

Invited Scientific Committee member, International Scientific Committee of the 10th International Conference on Urban Climate (ICUC10) of the International Association of Urban Climatology, (<http://www.urban-climate.org/>) and the 14th Symposium on the Urban Environment of the American Meteorological Society (14SUE) to be held August 6-10, 2018 <https://www.ametsoc.org/ams/index.cfm/meetings-events/ams-meetings/10th-international-conference-on-urban-climate-14th-symposium-on-the-urban-environment/icuc-10-committee-listing/>

## Continuing professional appointments:

### City of New York Third NYC Panel on Climate Change

Standing Committee on Critical Transportation Infrastructure Protection, ABR10 Transportation Research Board, National Research Council, National Academies, Continuing committee member & co-Chairperson, Physical Security subcommittee.

## Dr. John Falcocchio, UTRC's Chairperson and Professor at NYU Tandon Shcool of Engineering Publishes an article, A *data-driven methodology for equitable value-capture financing of public in the Elsevier's Journal of Transportation Policy transit operations and maintenance*

Despite the importance of rail infrastructure to the effective and efficient functioning of dense urban areas and their commercial business districts, funding for operations and maintenance of transit systems is a common challenge for cities. Operational funds are derived from a range of sources, including fare and toll revenues, taxes, and fees. In cities with aging infrastructure, traditional funding mechanisms are falling short of actual need, even as many cities experience record ridership levels. Therefore, new funding streams are necessary to safely, efficiently, and equitably operate and maintain an aging rail infrastructure in the face of growing demand. This paper presents a socio-spatial model of rail transit ridership demand to develop a computational method for valuecapture funding mechanisms that link existing commercial properties and transit infrastructure operations.

To access the full article, please follow the link: <https://www.sciencedirect.com/science/article/pii/S0967070X17304225>

## SYRACUSE UNIVERSITY

### A Workshop on Implementation of Asset Management Principles for Local Street Networks

A UTRC-2 sponsored workshop was hosted at Syracuse City Hall on February 7, 2018. The workshop was offered by Dr. Baris Salman; and it focused on implementation of asset management principles in management of local street networks. The list of participants included City of Syracuse Employees from various divisions as well as faculty participants from Syracuse University's College of Engineering and Computer Science. The workshop topics included: Definition of Asset Management, Importance of Implementing an Asset Management System, and Five Pillars of Asset Management: Generating an Inventory Database, Condition Assessment and Monitoring, Generating Deterioration Prediction Models, Risk Management, and Decision Making Systems. Workshop exercises were distributed at the end of each instructional session to facilitate information exchange and ideation. Overall, the workshop was highly beneficial as it brought together key personnel and faculty from different backgrounds to have a common understanding with regards to the current state of the City in implementing asset management practices and the appropriate measures to be taken in the near future to ensure city assets can be managed more efficiently. The diversity of participants' backgrounds ensured that the discussion could be extended to other important city networks, such as sewers and water networks, and thus played a more role in highlighting the importance of interdependencies between street networks and other infrastructure systems.



### OPEN RFPs (NYSDOT/UTRC) (OPEN TO UTRC'S CONSORTIUM FACULTY ONLY)

#### DEVELOP MANUFACTURED TOPSOIL MIXES TO SUPPORT THE GROWTH OF POLLINATOR-FRIENDLY VEGETATION IN ROADSIDE SETTINGS

UTRC has just posted a NYSDOT RFP for Develop Manufactured Topsoil Mixes to Support the Growth of Pollinator-Friendly Vegetation in Roadside Settings. The objective of this research is to identify manufactured soil mixes that support the growth of native (ideally local ecotype), pollinator-friendly vegetation in roadside settings.

The deadline for submission of your proposal is COB on [April 16, 2018](#).

#### EFFECTS OF A MODIFIED MOWING REGIME IN NYSDOT ROWS ON POLLINATORS AND VEGETATION

UTRC has just posted a NYSDOT RFP for Effects of a Modified Mowing Regime in NYSDOT ROWs on Pollinators and Vegetation. This project's main objective is to help address NYSDOT's state-wide response to national pollinator conservation efforts. Pollinators such as honey bees, native bees, flies and butterflies have been declining over last few decades.

The deadline for submission of your proposal is COB on [April 26, 2018](#).

#### BIOLOGICAL CONTROL TARGETING INVASIVE BLACK AND PALE SWALLOW-WORTS

UTRC has just posted a NYSDOT RFP for Biological Control Targeting Invasive Black and Pale Swallow-worts. The project objective is to reduce the transportation, economic and ecological impacts of swallow-worts on highway ROWs by furthering research efforts to assess the utility of biocontrol agents.

The deadline for submission of your proposal is COB on [April 27, 2018](#).

RFPs are available on the website: <http://www.utrc2.org/research/rfps>  
If interested in applying, you must register at <http://ppms.utrc2.org>



# UPCOMING EVENTS



## **BIG DATA, AUTONOMOUS MOBILITY & THE LAW** MARCH 27 AT 12:00 PM

NYMTC OFFICE (25 BEAVER STREET, SUITE 201)



### **MATTHEW W. DAUS, ESQ.**

FORMER NYC TAXI & LIMOUSINE  
COMMISSIONER/CHAIR AND  
TRANSPORTATION TECHNOLOGY LAWYER

#### **NYMTC Brown Bag Discussion**

Matthew W. Daus, Esq., former NYC Taxi & Limousine Commissioner/Chair, transportation technology lawyer, Distinguished Lecturer at CUNY/CCNY's Transportation Center and President of the International Association of Transportation Regulators, will offer a special presentation regarding our transportation technology future. Mr. Daus will discuss the evolving laws and regulations impacting transportation data and privacy, including access to data (TNCs, taxis, paratransit, airports) by the public, government, academia and competing private company interests. Also, Mr. Daus, who on behalf of the National Academy of the Science's Transportation Research Board served as Co-Chair to the Legal Forum on Autonomous Vehicles, and is currently a U.S. delegate/planning committee member of the U.S./European Union's Summit on the Socio-Economic Impacts of Automated and Connected Vehicles, will address the legal and policy issues being researched internationally, and lead an interactive discussion on the future of the for-hire ground transportation industry as autonomous technology progresses.

### **NYMTC'S REGIONAL TRENDS SERIES**

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## 2018 NJ Transaction Conference

April 17-19, 2018 at the Hotel Tropicana

NJ TransAction 2018 will take place on April 17, 18 & 19, 2018 (Tuesday, Wednesday & Thursday) at the Tropicana Hotel, Casino and Conference Center, Atlantic City, NJ.

NJ TransAction 2018 will feature 70 workshop sessions (5-6 concurrent throughout each day) specializing in bus, rail, roads, bridges, goods movement, pedestrian/bicycle, paratransit, community transportation, ports and much more.

Dr. Camille Kamga and Matthew W. Daus will present at the conference on April 19th, their session details are as follows:

### **Autonomous Driving Is Coming – Will New Jersey Be Ready?**

(E) (P) Room: Reilly (Inside Exhibit Hall/South Tower)

This workshop will include presentations and a panel discussion with New Jersey experts on autonomous vehicles, from universities, transit and regulators. Topics include: State of the art – Where we are and what's coming in autonomous vehicles, Transit – Disrupting an industry and saving lives, regulatory matters, and Why NJ needs places to test autonomous driving.

Moderator: Dr. Camille Kamga, Associate Professor, City University of New York

Speaker: Dr. Alain L. Kornhauser, Professor of Operations Research & Financial Engineering, Princeton University

Speaker: Dr. Jerome M. Lutin, Senior Director of Statewide & Regional Planning, New Jersey Transit (Retired)

Speaker: Mr. Matthew W. Daus, Esq., Partner, Chair of Transportation Practice Group, Windels, Marx, Lane, & Mittendorf, LLP, and Distinguished Lecturer, University Transportation Research Center, Grove School of Engineering, City University of New York

To Register for this year's conference, please visit the website at: <https://www.njtransaction.com/>

## 2018 SmartDriving Car Summit

May 16-17, 2018 at Princeton, NJ



This conference brings together the buyers, sellers and facilitators of SmartDrivingCars, trucks and buses. It is time to move past the hype and accelerate the commercialization and deployment of SmartDriving technology so that society can begin to capture its benefits.

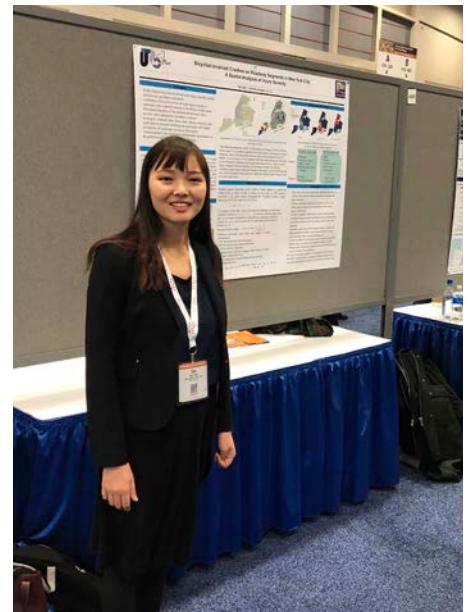
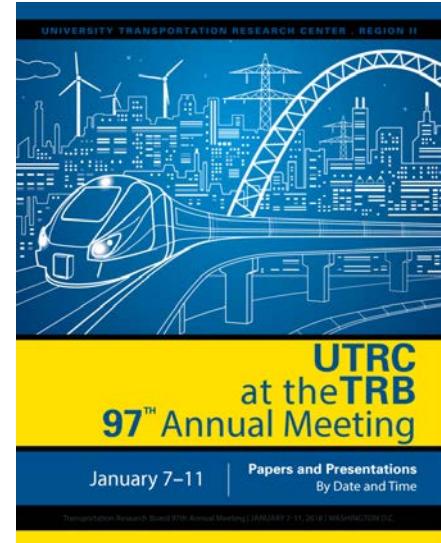
To Register for this year's conference, please visit the website at: <http://summit.smartdrivingcar.com/>

# PAST EVENTS

## UTRC at the TRB 97th Annual Meeting

January 7-11, 2018 at Washington, DC

UTRC colleagues and staff actively participated in the 97th Transportation Research Board Annual Meeting, held on January 7-11, 2018 at Washington, DC. UTRC annual TRC compendium featured our center's researchers' presentation, papers, and posters during the annual meeting. This compendium can be accessed at: <http://files.constantcontact.com/08b78404201/baaa9584-9765-4b2b-a5cf-35704d9338fb.pdf>



# UTRC STAFF

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Distinguished Professor of Civil  
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## **Sandeep Mudigonda**

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## **Rodrigue Tchamna**

Post Doctoral Research Fellow

## **Ellen Thorson**

Senior Research Fellow

## Consortium Members Include

- ▶ City University of New York
- ▶ Clarkson University
- ▶ Columbia University
- ▶ Cornell University
- ▶ Hofstra University
- ▶ Manhattan College
- ▶ New Jersey Institute of Technology
- ▶ New York Institute of Technology
- ▶ New York University
- ▶ Rensselaer Polytechnic Institute
- ▶ Rochester Institute of Technology
- ▶ Rowan University
- ▶ State University of New York
- ▶ Stevens Institute of Technology
- ▶ Syracuse University
- ▶ The College of New Jersey
- ▶ University of Puerto Rico Mayagüez



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