REGION II **UNIVERSITY TRANSPORTATION**
RESEARCH CENTER

FALL 2017
RESEARCH NEWS

In This Issue

| HIGHLIGHTS | EDUCATION |

| EVENTS | CONSORTIUM NEWS |

| FACULTY PROFILE | RESEARCH |

HIGHLIGHTS

UTRC CONSORTIUM FACULTY FROM CCNY AND SUNY ALBANY RECEIVED NJDOT RESEARCH GRANT

DRONE/UAS REGULATIONS & POLICIES FOR USE IN NEW JERSEY

This project will provide analysis and recommendations to NJDOT for the purpose of developing regulations and policies for using Unmanned Aircraft Systems (UAS) for inspection, operation and management activities. The guidance will assist NJDOT on issues such as how to incorporate NJDOT's safety and risk management concerns and fully integrate with UAS best practices. The research recommendations will also advise on consistency with existing Federal regulations such as 14 CFR Part 107 and FAA Advisory Circular 107-2.

The study will consist of a literature review phase and a research phase. Research topics will include resolution of regulatory issues in the use of UAS by NJDOT and the development of recommended risk assessment and safety procedures. An implementation and training plan is also included in the project's scope of work.

Overall, this research is intended to provide further information and guidance into best practices in order to provide direction on issues such as:

Principal Investigator(s):
Dr. Anil Agrawal and Dr. Camille Kamga
Performing Institution:
The City College of New York, CUNY

1. How to ensure public UAS operations are held to a high standard of transparency and operational legitimacy?
2. How incidentally collected data should be handled, destroyed, retained, or utilized?
3. How should public UAS operators secure permission from private property owners for takeoff, landing, or the location of person(s) operating the system? What about in support of emergencies, disaster response, or other similar situations?
4. Regulations regarding privacy, hunting and fishing, and critical infrastructure.
5. Operations from an airport. Should include a survey to public use airports regarding UAS activities.
6. Permits for commercial UAS operators similar to the aviation activity permits under 16.55.
7. How do we setup UAS operations near a roadway, how close should we fly?
8. Changes to FAA legislation Drone/UAS Regulations & Policies for Use in NJ.

TRAVELER INFORMATION APPLICATION FOR ROUTE 1 AND ROUTE 18 CORRIDORS

The objective of this project is to develop a hands-free Mobile Application (app) platform to aid travelers. The app will offer travel information that utilizes the data NJDOT currently collects from its real-time transportation information systems as well as additional travel related information such as transit and shuttle schedules and availability of parking. Input for this app will come from NJDOT's central data fusion engine that analyzes and prioritizes travel time source data from its various real-time transportation information systems, such as Bluetooth, Transmit Travel Time System and vehicle probe data.

Principal Investigator(s):
Dr. Catherine Lawson
Performing Institution:
University at Albany, SUNY

This project will primarily provide information for the Route 1 corridor (from I-295 to Garden State Parkway), including sections of Route 18 (from New Jersey Turnpike to Rutgers University – Piscataway, NJ), specific to certain destinations such as colleges and/or large employment destinations. Later on other corridors and/or destinations could be added to the system.

AASHTO RESEARCH ADVISORY COMMITTEE SELECTED NYSDOT/ UTRC FUNDED PROJECT FOR THE 2017 SWEET SIXTEEN - HIGH VALUE RESEARCH PROJECTS

Each year, AASHTO's Research Advisory Committee (RAC) selects four projects from each of its four regions which then comprise a group called the "Sweet Sixteen". This year's recipients are invited to deliver a five-minute presentation at the Sweet Sixteen session at the 2017 AASHTO RAC/TRB Representative Annual Meeting in Louisville, KY.

The project titled "*Analysis of Energy Efficient Highway Lighting Retrofits*" performed by the Lighting Research Center (LRC) at Rensselaer Polytechnic Institute is among those selected for the 2017 Sweet Sixteen in Region 1. The project's investigators are Dr. Mark S. Rea and Dr. John Bullough.

In order to assist the New York State Department of Transportation (NYSDOT) in identifying roadway lighting retrofit options for two types of highways, parkways and arterial roadways, the project team at LRC conducted field measurements, photometric analyses and energy analyses, using information about existing and alternative lighting configurations on two New York State highways.

The project's full report is available on the UTRC's website at:
http://www.utrc2.org/sites/default/files/pubs/Energy-Efficient-Highway-Lighting-Retrofits.pdf

To view the full list of the 2017 AASHTO's Sweet Sixteen, please visit the website at:
https://research.transportation.org/sweet-sixteen-2017/

UTRC RELEASES SHORT VIDEOS ON THE COMPLETED PROJECTS FOR THE FIRST PHASE OF THE NYC COORDINATED INTELLIGENT TRANSPORTATION SYSTEMS DEPLOYMENT (CIDNY)

The Federal Highway Administration (FHWA), through its New York Division/New York City Metropolitan office is promoting programs pertaining to urban Intelligent Transportation Systems (ITS) in the region. The NYCDOT and NYSDOT-Region 11 have taken the initiative to develop ITS related projects under this FHWA program. NYCDOT and NYSDOT have developed Training Courses and Research and Development Programs for the NYCDOT and NYSDOT Coordinated Intelligent Transportation Systems Deployment in New York City (CIDNY) which is a set of multi studies toward the fulfillment of the objectives of this program.

The studies are being performed by institutions of the Region 2 University Transportation Research Center (UTRC).

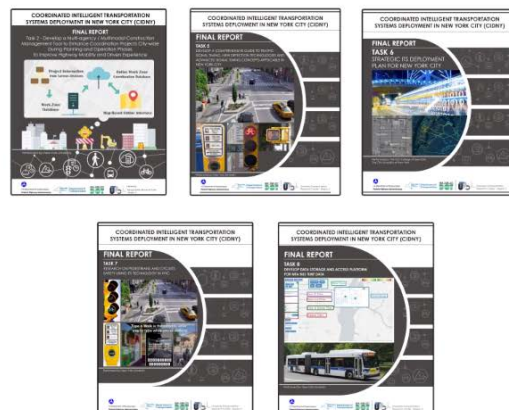The video briefings on all completed projects are available on UTRC's Vimeo Channel. https://vimeo.com/utrcregion2
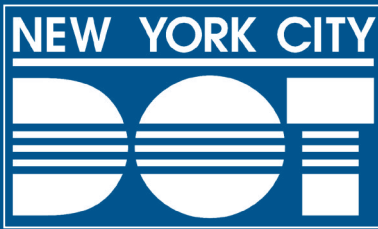
Project Overview

NYCDOT Project Mangers:

Ernest Athanailos, P.E.
Director, Signals & ITS Engineering
New York City Department of Transportation (NYCDOT)

James Celentano, P.E.
New York City Department of Transportation (NYCDOT)

NOW ON
vimeo

NYC Connected Vehicle Pilot
Pedestrian Safety Applications

New York City (NYC) is one of three sites selected by the U.S. Department of Transportation for its Connected Vehicle (CV) Pilot Deployment Program to demonstrate the benefits of CV technology. The New York City Department of Transportation (NYCDOT) leads the NYC Pilot which is primarily focused on employing CV technology to improve the safety of travelers within the city.

This project will be the largest CV technology deployment so far and will present the opportunity to evaluate the performance of this technology in a dense urban transportation network. Most importantly, it will help NYC to move closer to reaching the Vision Zero goal of eliminating fatalities and injuries caused by traffic accidents. CV technology will improve street safety by alerting vehicle drivers so that they can avoid collisions with other vehicles and pedestrians.

Image Courtesy of the New York City Department of Transportation (NYCDOT)

Pedestrian safety is very important to the Pilot as pedestrians account for the majority of fatalities in traffic accidents in New York City.

Of the 14 CV safety applications that will be included in the Pilot, two involve pedestrians:

- *The Mobile Accessible Pedestrian Signal System Application*

- *The Pedestrian in Signalized Crosswalk Warning Application*

U.S. Department of Transportation

**Visit NYCDOT Connected Vehicle Website At:
www.cvp.nyc**

The Mobile Accessible Pedestrian Signal System Application

About 100 visually impaired pedestrians who regularly travel in the deployment sites in Manhattan and Brooklyn will be equipped with smart phones on which the application has been installed. These personal devices will communicate with traffic signals which will send information about the intersection and the signal timing back to the pedestrian and will communicate with vehicles approaching intersections to alert them of the pedestrian's presence so that the pedestrian can safely cross through the intersection.

Image Courtesy of the
U.S. Department of Transportation
(USDOT)

This image shows a blind man with a cane and a connected mobile device waiting to cross an intersection

The Pedestrian in Signalized Crosswalk Warning Application

The presence of pedestrians in a crosswalk will be detected by equipment installed in the traffic signal which will send an alert to drivers about this presence as they approach the intersection.

Facts about Pedestrian Safety

1

Pedestrians account for **56%** of the traffic fatalities citywide and **73%** of the fatalities in Manhattan, compared to the national average of **14%**.

2

Senior citizens over age of 65 make up **12%** of NYC's population but account for **33%** of all pedestrian fatalities. For children under 14, the primary cause for crash-related death is from being struck by a vehicle.

3

The most common behavior of pedestrians and bicyclists who are involved in crashes is crossing with the signal at signalized intersections.

4

The crash risks increase during nighttime hours when vehicle speeds tend to be higher and it becomes more difficult to see pedestrians crossing.

Fact's Sources

1) Borough Pedestrian Safety Action Plans, New York City Department of Transportation.
http://www.nyc.gov/html/dot/html/pedestrians/ped-safety-action-plan.shtml

2) Vision Zero Action Plan, New York City Department of Transportation.
http://www.nyc.gov/html/visionzero/assets/downloads/pdf/nyc-vision-zero-action-plan.pdf

U.S. Department of Transportation

Visit NYCDOT Connected Vehicle Website At:
www.cvp.nyc

EDUCATION

SEPTEMBER 11TH MEMORIAL PROGRAM SCHOLARSHIP RECIPIENTS

ACADEMIC YEAR 2017-2018

The New York Metropolitan Transportation Council (NYMTC) established the September 11th Memorial Program for Regional Transportation Planning to honor the memory of **Ignatius Adanga**, **Charles Lesperance**, and **See Wong Shum**, the three employees it lost during the attack on the World Trade Center. The program was established to educate and motivate people interested in transportation technology and planning and to encourage innovations in planning activities throughout the NYMTC region. The Program's Academic Initiative is designed to foster the academic and professional development of students by providing them with opportunities to participate in innovative research and planning projects. It is administered by the University Transportation Research Center (UTRC).

The NYMTC September 11th Memorial Program Scholarship, administered by the University Transportation Research Center selected two recipients for the academic year 2017-2018.

SHIRIN NAJAFABADI | CITY COLLEGE OF NEW YORK, CUNY

Shirin Najafabadi is a PhD student in Transportation Engineering at the City College of New York. Her 9/11 program internship is with NYMTC and she will work closely with NYMTC Planning Group to work on "**Vertical Integration of Land Use and Transportation Planning**" project. NYMTC's members introduced the idea of Coordinated Development Emphasis Areas (CDEAs) in Plan 2045, the recently adopted Regional Transportation Plan. These are areas within the NYMTC planning area, where land development and transportation investment planning are to be coordinated to achieve environmental sustainability, local economic revitalization, and improved quality of life. Her role is to research methods to establish the influence of NYMTC's regional transportation plans on municipal land use planning decisions. Conversely, she will also research methods to help NYMTC ensure that municipal planning efforts are incorporated into the regional planning perspective.

Ms. Shirin Najafabadi has received her M.S. in Transportation Planning on May 2014 from the State University of New York at Albany, and has been admitted to the CCNY Ph.D. program through an extremely competitive selection process. Ms. Najafabadi's record in transportation planning, modeling and analysis has been outstanding. Her research involves the application of mathematical optimization, machine learning and statistics to transportation problems.

SIDDHARTH SHAH | NEW YORK UNIVERSITY

Siddharth Shah is a student in the Masters of Urban Planning at New York University's Robert F. Wagner Graduate School of Public Service. As part of the 9/11 Memorial Scholarship program, he will intern at the New York City Department of Transportation (NYCDOT) in their Research, Safety and Implementation team. At NYCDOT, his work will involve updating the Vision Zero Pedestrian Safety Borough Plans, first published in 2015, by analyzing the progress on the previous commitments and the impacts on pedestrian safety in Vision Zero priority locations. He shall simultaneously help the Research, Safety and Implementation team in their ongoing policy research to make the streets of New York City safer for all.

Mr. Shah obtained a Master of Science in Civil Engineering from University of Illinois at Urbana-Champaign and a Bachelors of Technology from CEPT University (India), where he received the convocation award for Academic Excellence. He has a broad interest in the built environment of cities with a focus on the areas of transportation, environment, and infrastructure in developed as well as developing economies.

UTRC SUPPORTED THE 2017 ITS-NY BEST STUDENT ESSAY AWARD

Continuing its long tradition, UTRC supported the 2017 ITS-NY Best Student Essay Award. The award was given to **Mr. Bahman Moghimi** who is a Ph.D. Student in Transportation Engineering at the City College of New York. Bahman is also a Research Assistant at the University Transportation Research Center. The award was announced at the 24th IT-NY Annual Meeting and Technology Exhibition in Saratoga Springs, NY, held on June 15-16, 2017.

Bahman's winning essay titled; **A Review of Recent Technologies for Applications of Connected and Autonomous Vehicles** was selected as the winner of the 2017 ITS-NY Best Student Paper Competition.

Paper Abstract: Traffic congestion, safe mobility and environmental impact are three very important considerations of the current day transportation. Connected and autonomous vehicles (CAVs) are rapidly becoming a reality to ensure that all the three factors are satisfied. Government agencies, private car manufacturers and technology industry are working together to bring CAVs to fruition. Seamless functioning of CAVs and their applications require a thorough understanding of diverse fields. Hence, CAVs are currently one the most hotly researched areas in many specializations. Given the CAVs are being realized are a fast pace, a transportation professional needs a good understanding of these various facets. This paper aims to provide the transportation professional with a holistic understanding of the field of CAVs. We review various technologies involved in the various functions in the implementation of CAVs ranging from sensing, communication, computing and security. We discuss various pros and cons of existing technologies and discuss the state-of-the-art in research.

From (L) to (R): Jeff Randall, ITS-NY Retiring President; Bahman Moghimi, Ph.D. Student in Transportation Engineering, CCNY; and Dr. Camille Kamga, UTRC Director

UTRC SUPPORTED THE 2017 WTS'S LEONARD BRAUN MEMORIAL GRADUATE SCHOLARSHIP

Trilce Encarnación is the 2017 awardee of the WTS of Greater New York Leonard Braun Scholarship, which is co-sponsored by UTRC and WTS. Trilce is currently a Ph.D. student in Transportation Engineering at Rensselaer Polytechnic Institute. She holds an M.E. in Industrial and Management Engineering from Rensselaer Polytechnic Institute, and an M.S. in Scientific Computing (Statistics) from the University of Puerto Rico at Mayaguez.

Trilce's research interests are in humanitarian logistics and sustainable urban freight. Her work in humanitarian logistics is highly multi-disciplinary, integrating principles from management, economics, engineering, and social sciences. Trilce has also participated in projects in the area of urban freight including involvement in the VREF (Volvo Research Educational Foundations) Center of Excellence for Sustainable Urban Freight at RPI.

Some of Trilce's professional accomplishments so far include serving as a Fellow at the Eno Center for Transportation and recipient of the Academic Excellence Award from the Capital District Council of Supply Chain Management Professionals. She has also been awarded the 2017 Franz Edelman Finalist Award for her work in the "Off-Hours Delivery Project in New York City" and has been selected to participate in the MIT Civil and Environmental Engineering Rising Stars Workshop. Prior to starting her Ph.D. studies, she had been a consultant and adjunct professor of systems engineering in the Dominican Republic. After graduation, Trilce plans to pursue a career in academia, where she hopes to establish a research program that proposes solutions to transportation issues. As a volunteer, Trilce is involved in outreach to encourage young women to pursue STEM careers.

EVENTS

DR. ROBERT E. PAASWELL, UTRC'S DIRECTOR EMERITUS PRESENTED AT THE TRANSIT FORUM: GETTING BACK ON TRACK: THE NEW YORK TRANSIT CRISIS, HOSTED BY MURPHY INSTITUTE, CUNY *October 13, 2017 at Murphy Institute, CUNY*

This forum explored the nature and causes of the current mass transit crisis with a focus on solutions that will enable New York City to sustain itself as a world-class city. During the course of two panels, speakers offered strategies to modernize and maintain the City's transit systems, with responses from local elected leaders on the crisis and policies to remedy it.

To access Dr. Paaswell's Panel Video, please visit the link at: http://murphyinstituteblog.org/cal/getting-back-on-track-the-new-york-transit-crisis/

NYMTC HOSTED PRESENTATIONS FOR SEPTEMBER 11 MEMORIAL PROGRAM FOR REGIONAL TRANSPORTATION PLANNING *September 27, 2017 at NYMTC*

This article is authored by Michael Giardina of NYMTC.

NYMTC hosted its 11th annual September 11th Memorial Program Brown Bag presentation on September 27, 2017. Two recipients for the academic year 2016-2017; Bahman Moghimi, PhD candidate in Transportation Engineering at the City College of New York and Patricio Vicuna, PhD candidate in Transportation Engineering at the City College of New York presented their research work.

Bahman's research focused on the impact of Transit Signal Priority (TSP) on transit service and regional transportation planning (i.e. travel speed, congestion and air quality). To access his presentation, please click here.
Patricio's internship involved the analysis and the implementation of automatic vehicle location data mining, visualization, and dashboard functionality for evaluating the New York City Department of Transportation's Clean Truck Program and improving regional freight delivery efficiency. To access his presentation, please click here

In partnership with the University Transportation Research Center, NYMTC's September 11th Memorial Program for Regional Transportation Planning honors three of their staff members who perished in the attack on the World Trade Center on September 11, 2001: Ignatius Adanga, Charles Lesperance, and See Wong Shum. The Program provides assistance to students and organizations for projects in both academic and public policy arenas to educate and motivate those who are interested in transportation technology and planning.

NYMTC's September 11th Memorial Program's 2016-2017 Interns with NYMTC, NYSDOT, and UTRC Staff at the Brown Bag Presentation

Photo by John Lopez, NYMTC

30th INTERNATIONAL ASSOCIATION OF TRANSPORTATION REGULATORS (IATR) 2017 ANNUAL CONFERENCE   *September 24-27, 2017, Austin, Texas*

The 30th IATR Annual Conference was held on September 24-27, 2017 in Austin, Texas. The conference theme was "**Keeping Regulation Weird?**"! The presentations included all the major issues facing regulators. The conference program highlighted many new IATR members and sister organizations of government transportation professionals in the public transit, motor vehicle administration, airport, public utilities and traffic management arenas.

UTRC's Distinguished Lecturer Matthew W. Daus, who serves as the IATR president, and IATR's Board Chair, James Ney welcomed the conference participants. The IATR conference began with its first-ever entry-level training for new regulators, called "**Regulatory Boot Camp**" to aspiring professionals who have recently joined government agencies. The Boot Camp was comprised of the following training sessions.

1. Understanding the Regulatory Paradigm,
2. Regulatory Management: Licensing, Enforcement, Data Management, and Performance Measure, and
3. Regulatory Policymaking & Legislative /Rule-making Drafting & Procedures

UTRC's Director, **Dr**. **Camille Kamga** who is also a member of the IATR Advisory Board, actively participated in the conference. Dr. Kamga also moderated plenary sessions on **Automated & Connected Vehicles – The Future Role of Regulation** and **Accessible Solutions – A Future of Equity and Service for All**. He also co-moderated a breakout session on the IATR's upcoming **Accessible Data Chal-lenge**. The conference was very well attended by international regulators and many presenters shared their best state/ city practices with attendees.

Formed in 1987, through the merger of two separate groups of U.S. and Canadian regulators, the IATR held its first conference in Tampa, Florida, and then held conferences in North America and beyond, from as far as Stras-bourg, France, to Anchorage, Alaska. As IATR turns 30 at one of the most ex-citing times in transportation history, where technology is causing inter-re-lated transport modes and businesses to merge and work together, IATR took a major step in forming an **Advisory Board** including the following: international organizations such as the **International Public Transportation Association (UITP)**, **the International Transport Forum (ITF-OECD)** and **Keroul**; U.S. groups such as **APTA**, **AAMVA**, the **Airport Ground Transportation Association (AGTA), the National Conference of State Transportation Specialists (NCSTS)**, the **Responsible Hospitality Institute** (**RHI**), and the **National Conference** on **Weights and Measures** (**NCWM**); and Universities such as the **City University of NY** and the **University of California**, **Berkeley**. The IATR has broadened its membership base well beyond taxi regulators to include airports, Public Utilities Commissions, Motor Vehicle Departments, Transit and Traffic agencies, on a federal, state and local level, including members from all around the world on almost every continent. Membership is open to any transportation government agency and associate membership to industry groups and stakeholders, so if you are thinking of joining, visit www.iatr.global or email info@iatr.global with any questions or comments.

Finally, IATR announced the next phase of IATR's regulatory liberty in the "City of Brotherly Love" – Philadelphia – where regulatory freedom will be on full display in 2018 for its 31st Annual Conference. While there is no way to predict the next 30 years, 30 days or 30 minutes, as technology and regulatory developments are moving at lightning speed, let's wish IATR a "Happy 30th Birthday!

To read the full article authored by Matthew W. Daus, please visit the TaxiCab Times artile here.

2016 IATR Hackthon Winners Presented at the 2017 IATR Annual Coference

From (L) to (R): Dr. Camille Kamga, UTRC Director; Xinwu Qian, Purdue University; Mahmoud Saleh, NYIT; Matthew Daus, IATR President; and James Ney, IATR Board Chair

From (L) to (R): Dr. Camille Kamga, UTRC Director; Dr. Alain Kornhauser, Princeton University; Casey Gerber, AAMVA; Matthew Daus, IATR President; and Paul Brubaker, ATI21

From (L) to (R): Dr. Camille Kamga, UTRC, City College/CUNY; IATR President Matthew W. Daus, Esq.; Keynote Luncheon Speaker Hon. Daphne Y. Jefferson, Deputy Administrator of the Federal Motor Carrier Safety Administration (FMCSA); Selika Gore, Senior Advisor, DOT/FMCSA; and Dr. Alain Kornhauser, Princeton University.

UTRC HOSTED A SECOND SUMMIT ON THE FUTURE OF THE TAXI MEDALLION SYSTEM AND FOR-HIRE GROUND TRANSPORTATION INDUSTRY
June 27, 2017 at New York Institute of Technology

UTRC hosted the second summit on this topic, focusing on facts and opinions from a wide variety of stakeholders, policy-makers and researchers on the current state of the NYC taxicab medallion industry, including ridership, medallion values and marketplace trends. Panelists and participants shared observations, opinions and proposed solutions to help level the playing field, and to promote equity, accessibility and sustainability for all. Necessary legal, rulemaking and policy changes were discussed, including caps or growth limitations on For-Hire Vehicles, the possibility of a taxicab fare increase and flexible taxis fares, enforcement and implementation of the new upstate Transportation Network Company (TNC) law, and the future of business at NYC and New Jersey area airports. The impact of the new TNC law, expected airport fees and changes, and the policy reasons for the regulatory framework that defines taxicabs, liveries, black cars and limousines, commuter vans, paratransit service, shared rides, and smartphone apps (e-hails) were addressed.

Press Releases on the Event: TAXIintell and TLC Magazine

The event's videos, photos and the program can be accessed at:

http://www.utrc2.org/events/second-summit-taxi-medallion-system.

UTRC ORGANIZED NYMTC PEER EXCHANGE MEETING WITH MPOS
May 18, 2017 at NYMTC's Office

This article is authored by Michael Giardina of NYMTC.

With the assistance of the University Transportation Research Center (UTRC), the New York Metropolitan Transportation Council (NYMTC) hosted a Metropolitan Planning Organization (MPO) Peer Exchange meeting, which included MPOs from Northern Illinois, the Greater Philadelphia Region, the San Francisco Bay Area and the Northern New Jersey.

MPO Peer Exchange Participants included NYMTC, the Chicago Metropolitan Agency for Planning (CMAP), the Delaware Valley Regional Planning Commission (DVRPC), the Metropolitan Transportation Commission (MTC) and the North Jersey Transportation Planning Authority (NJTPA)

NYMTC Executive Director, **Jose M**. **Rivera**, along with members of NYMTC's Program, Finance, and Administration Committee (PFAC) participated in a lively discussion regarding MPO critical issues, funding, operations and challenges. Member agency representatives – as delegated by the Council – make up PFAC, which is responsible for overseeing NYMTC's day-to-day activities.

Dr. Robert Paaswell, **Dr. John Falcocchio**, and **Dr**. **Camille Kamga** from UTRC organized and moderated the MPO peer exchange meeting.

Photos by John Lopez, NYMTC

STATE UNIVERSITY OF NEW YORK (SUNY)

UTRC Consortium Faculty, Dr. Daniel Hess's Expertise on Evacuation Strategies during Hurricanes

Dr. Daniel Hess is professor of urban planning at the University at Buffalo, SUNY. He has done extensive research on the subject of extreme events evacuation planning. Recently, he was interviewed about the evacuation related to Hurricane Irma.

" Of all the woeful gaps in disaster preparedness and planning that Americans are now being confronted with lately, this could be the lowest-hanging fruit. As Hurricane Harvey descended on Texas two weeks ago, Houston Mayor Sylvester Turner decided against issuing an evacuation order—largely because of highway capacity. "That seems like a failure of emergency evacuation," says Daniel B. Hess, a professor of urban planning at the University at Buffalo who has studied volunteer-led evacuation efforts in the face of disaster. "Surely we can do a better job of coordinating people who are ready and willing to evacuate, but can't, because they don't have a car or anyone to take them." **"**
Source: https://www.citylab.com/transportation/2017/09/where-is-the-app-for-escaping-a-hurricane/539184/

He has also written an article in US News and World Report entitled "***Hospitals Use Their Own Emergency Plans in a Hurricane***" To access this article, please follow the link:
https://www.usnews.com/news/healthcare-of-tomorrow/articles/2017-09-12/what-do-hospitals-do-in-a-hurricane-use-their-own-emergency-plans

Recently Published Articles by Dr. Hess
Hess, Daniel Baldwin. 2017. Transport in Mikrorayons: Accessibility and Proximity in Centrally Planned Residential Districts During the Socialist Era, 1957 – 1989. Journal of Planning History. [doi: 10.1177/1538513217707082]

Hess, **Daniel Baldwin**. 2017. Repealing Minimum Parking Requirements in the Green Code in Buffalo: New Directions for Land Use and Development. Journal of Urbanism: International Research on Placemaking and Urban Sustainability. vol. 10. no. 4. pp. 442-467.[doi: 10.1080/17549175.2017.1310743]

Hess, **Daniel Baldwin**, John Travis Norton, JiYoung Park, and Debra Street. 2016. Travel Mode Choice Decisions for Older Adults: The Influence of the Built Environment and Weather. Submitted to Transportation Research, Part A: Policy and Practice. vol. 88 pp. 73-85.[doi: 10.1016/j.tra.2016.03.011]

Hess, **Daniel Baldwin** and Alex Bitterman. 2016. Branding and Selling Public Transit in North America: An Analysis of Recent Messages and Methods. Research in Transportation Business and Management. vol. 18. pp. 49-56. [doi: 10.1016/j.rtbm.2016.01.001]

Two Book Chapters:

Hess, Daniel Baldwin and Brian Conley. 2016. A Tough Move to Make: Lessons Learned from Emergency Evacuations in Coastal Connecticut During Hurricane Sandy. Taking Chances on the Coast After Hurricane Sandy. Karen M. O'Neill and Daniel J. Van Abs, eds. New Brunswick, New Jersey: Rutgers University Press. pp. 44-62. ISBN-13: 978-0813-5-7377-9

Hess, **Daniel Baldwin** and Christina M. Farrell. 2016. Evacuation from Disaster Zones: Lessons from Recent Disasters in Australia and Japan. Securing Transportation Systems. Simon Hakim, Gila Albert, and Yoram Shiftan, eds. London: John Wiley and Sons. pp. 315-344. ISBN-13: 978-1118977934

CITY UNIVERSITY OF NEW YORK (CUNY)

Dr. James Cohen, City University Professor Emeritus and UTRC Colleague to Present at the 2017-18 LabEx-Sorbonne Seminar on the History of Science and Innovation

The French Laboratoire d'Excellence (LabEx) and the Sorbonne University of Paris have invited Jim Cohen, City University Professor Emeritus and UTRC colleague, to give a lecture in March, 2018, on "The Influence of Transnational Relationships between the U.S., France, and Japan, on the Development of High Speed Rail Technology, 1930-present." Dr. Cohen's lecture will be part of the 2017-18 LabEx-Sorbonne Seminar on the History of Science and Innovation.

MANHATTAN COLLEGE

UTRC Research Grant was Presented and Published by Dr. Yongwook Kim, an Assistant Professor of Civil & Environmental Engineering at Manhattan College

- **Yongwook Kim**, Salvatore Florio, and Qian Wang: "Damage Evaluation of Aging Transportation Structures Subjected to Close-In Detonations." Presented at EMI (Engineering Mechanics Institute) 2017 Conferences on June 4-7, 2017. http://jacobsschool.ucsd.edu/events/2017/emi2017/
- **Yongwook Kim**, Salvatore Florio, and Qian Wang: "Blast Analysis of Aging Transportation Structures with Little Stand-off Distance." Published proceeding for ASCE Congress on Technical Advancement 2017 on Sept. 10-13, 2017. http://www.asce-cta.org/
- **Yongwook Kim**, Salvatore Florio, and Qian Wang: "Undergraduate Student Research in Blast Simulation of Wide Flange Steel Columns." Presented at ASEE Mid-Atlantic Section Spring 2017 Conference on April 8–9, 2017. http://middleatlantic.asee.org/

NEWS FROM NEW YORK UNIVERSITY

Dr. Rae Zimmerman's Recent Publications:

R. Zimmerman, Q. Zhu, and C. Dimitri, "**A Network Framework for Dynamic Models of Urban Food, Energy and Water Systems (FEWS)**," Journal of Environmental Progress & Sustainable Energy. http://onlinelibrary.wiley.com/ Published online 22 AUG 2017, DOI: 10.1002/ep.12699.

R. Zimmerman, "Implications of Combined Infrastructure Concentration and Interdependency for Extreme Event Recovery," Proceedings of the 12th International Conference on Structural Safety & Reliability (ICOSSAR 2017), edited by C. Bucher, B.R. Ellingwood and D.M. Frangopol, Vienna, Austria, 2017, pp. 2122-2131.

R. Zimmerman, Q. Zhu, F. de Leon, and Z. Guo, "**Conceptual Modeling Framework to Integrate Resilient and Interdependent Infrastructure in Extreme Weather**," Journal of Infrastructure Systems, Volume 23 Issue 4, forthcoming December 2017, (online) 04017034-1 to 13.

R. Zimmerman, "Financing Sustainable Infrastructure: Reconciling Disaster and Traditional Financial Resources," Proceedings of the ASCE International Conference on Sustainable Infrastructure, NYC, to appear October 2017.

R. Zimmerman, "**Effective Public Service Communication Networks for Climate Change Adaptation**" In: Climate Change Adaptation in North America: experiences, case studies and best practice, edited by W. Leal Filho and J.M. Keenan. Berlin: Springer, 2017, pp. 241-259. DOI 10.1007/978-3-319-53742-9. ISBN 978-3-319-53741-2 [FINAL PUBLICATION

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

September 18-22, 2017. Resilience Week 2017 (http://www.resilienceweek.com/), Wilmington, DE, Panel on Response and Recovery in Disrupted Systems:
- Q. Zhu and R. Zimmerman, "**A framework to understand energy and transportation interdependencies with combined co-location and co-functionality interconnections for disabling urban transit systems**"
- R. Zimmerman, "The Water Nexus with Multiple Infrastructures."

September 6, 2017. R. Zimmerman, invited speaker, on infrastructure and climate resilience for the IGLUS (Innovative Governance of Large Urban Systems) initiative at EPFL - École Polytechnique Fédérale de Lausanne and City University of NY (CUNY) training program on governance of sustainable urban systems.

August 14, 2017. R. Zimmerman, invited speaker, "**Interdependence, Risks and Community Service Effects of Extreme Events,**" Presentation for the IDB Megacities Strategic Broadening Seminar at the U.S. Army Fort Hamilton, NY Army Base.

August 6-10, 2017. R. Zimmerman, "**Implications of Combined Infrastructure Concentration and Interdependency for Extreme Event Recovery,**" 12th International Conference on Structural Safety & Reliability (ICOSSAR 2017), sponsored by The International Association for Structural Safety and Reliability (IASSAR), Vienna, Austria. http://icossar2017.conf.tuwien.ac.at/home/

July 10-14, 2017. R. Zimmerman, "**Infrastructure Interdependencies and Sea Level Rise in Coastal Areas**" International World Climate Research Programme/Intergovernmental Oceanographic Commission (WCRP/IOC) Conference 2017 Regional Sea Level Changes and Coastal Impacts, Columbia University, poster presentation, July 12, 2017.

June 23, 2017. R. Zimmerman invited Webinar presentation for the Society for Risk Analysis. "**Risk Frameworks for the Simultaneous Intersection of Infrastructure Interdependencies, Infrastructure Usage, and Extreme Events.**"

May 10, 2017. "**Infrastructure Frameworks for Urban Resilience,**" Sandia National Laboratories and George Mason University Center for Infrastructure Protection and Homeland Security 2017 Frontiers in Resilience: Developing Innovative Resilience Solutions at the Interface of Science, Economics and Policy symposium.

May 4, 2017. "**Adapting infrastructure services for extreme weather events,**" First annual NYU Faculty Urban Research Day, New York, NY: NYU.

Conference Presentations (upcoming, accepted):

October 26, 2017. ASCE International Conference on Infrastructure Sustainability, "(419183) Financing Sustainable Infrastructure: Reconciling Disaster and Traditional Financial Resources;" Moderator of Finance panel.

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

Dr. Robert E. Paaswell on the News!

CBS New York
Subway Derailment In Harlem Caused By 'Human Error,' MTA Says
http://newyork.cbslocal.com/2017/06/27/abcd-subway-disruption-manhattan/

ABC 7
Exclusive: After Derailment, MTA still in Violation of Own Safety Regulations
http://abc7ny.com/traffic/exclusive-mta-still-in-violation-of-own-safety-regulations/2164861/

NBC4
It Will Cost More Than $3 Billion to Replace Aging Subway Signals System
http://www.nbcnewyork.com/news/local/New-MTA-Chairman-Faces-3-Billion-Train-Signal-Problem-joe-lhota-430214683.html

Matthew W. Daus on the News!

Final Report by Matthew W. Daus
May The U-Buyer Beware - Transportation Network Company (TNC) Risk Management Guidelines for Corporate Travel Professionals https://goo.gl/eqgnBz

Journal Article
Chaumont Menéndez CK, Socias-Morales C, Daus MW. Work-Related Violent Deaths in the US Taxi and Limousine Industry 2003 to 2013: Disparities Within a High-Risk Working Population. Journal of occupational and environmental medicine. 2017;59(8):768-774. doi:10.1097/JOM.0000000000001071.

Chicago Dispatcher
Look Ma, No Hands! The Impact Of Autonomous Vehicles On The Taxicab & For-Hire Ground Transportation Industry http://chicagodispatcher.com/look-ma-no-hands-the-impact-of-autonomous-vehicles-on-the-taxicab-for-p3225-1.htm

Taxi Intell
Disrupted by Technology and Politics! – The future of the Taxi medallion System & For-Hire Ground Transportation Industry http://www.taxiintelligence.com/disrupted-by-technology-and-politics-the-future-of-the-taxi-medallion-system-for-hire-ground-transportation-industry/

UTRC FACULTY PROFILE

Dr. THOMAS BRENNAN

Associate Professor

Department of Civil Engineering

The College of New Jersey (TCNJ)

Email: brennant@tcnj.edu

Dr. Thomas Brennan Jr. P.E., is currently an Associate Professor in Civil Engineering at the College of New Jersey (TCNJ). Dr. Brennan holds a Bachelor's and a Doctoral Degree in Civil Engineering from Purdue University, and a Master's Degree in Civil and Infrastructure Engineering from George Mason University. Dr. Brennan has spent over 17 years in research and consulting and is a licensed professional engineer registered in Virginia, New Jersey, and Pennsylvania. While at Purdue University, Dr. Brennan worked as a Senior Research Scientist for the Joint Transportation Research Program, collaborating with both Purdue University and the Indiana Department of Transportation. While at TCNJ, he has developed a transportation research program which has procured over $300,000 in grants for the 'undergraduate only' school. During summers of 2014-2017, Dr. Brennan has participated in TCNJ's 'Mentored Undergraduate Summer Experience' or MUSE program, having mentored over 18 students to develop publishable research as part of their experience. One summer Dr. Brennan had 14 international students working on a summer project. His research and scholarly interests have included the development of performance measures for high-resolution traffic signals, roadway performance measures using anonymous probe vehicle data sets, and the development of devices to detect distracted drivers. Some of UTRC-Region II sponsored work includes a finished project titled "Characterizing Highway Corridor Length to Evaluate Travel Time Reliability Using Probe Vehicle Data', as well as an ongoing project titled "Incorporating Probe Vehicle Data to Analyze Evacuation Route Resiliency". Dr. Brennan currently serves on the board for the Intelligent Transportation Society of New Jersey and the University Transportation Research Center- Region II. During his academic career he has published more than 25 journal paper, 30 conference papers and a number of research reports.

RESEARCH

COMPLETED RESEARCH PROJECTS

INNOVATIVE TRAVEL DATA COLLECTION RECOMMENDATIONS

Principal Investigator(s): Dr. Catherine T. Lawson
Institution(s): State University of New York (SUNY)
Sponsor(s): New York Metropolitan Transportation Council (NYMTC)
University Transportation Research Center (UTRC)

1. To identify and clarify these two emerging effects-real time data and changing culture,
2. To identify the shifts in data collection and transportation modeling that must take place to assist in identifying and forecasting travel behavior, and
3. To discuss the impacts of such operational shifts, both in cost and outcomes to provide NYMTC with the cost and efficacy impacts of incorporating these emerging tools.

To address these objectives, the research team at Albany Visualization and Informatics Lab (AVAIL), led by Dr. Catherine Lawson, PhD., from the University at Albany, conducted a literature review; a cost benefit analysis of current and emerging transportation data surveying and modeling methodologies; and produced a set of recommendations for the near-term and the longer-term. Access the full report at: http://www.utrc2.org/sites/default/files/Final-Report-Innovative-Travel-Data-Collection.pdf

METRICS, MODELS AND DATA FOR ASSESSMENT OF RESILIENCE OF URBAN INFRASTRUCTURE SYSTEMS

Principal Investigator(s): Dr. Patricia Nelson
Institution(s): New Jersey Institute of Technology (NJIT), Colorado School of Mines
Sponsor(s): University Transportation Research Center (UTRC)

This document is a summary of findings based on this research as presented in several conferences during the course of the project. The research focused on identifying the basic metrics and models that can be used to develop representations of performance response that can be used to define resilience in urban environments, and to bring together data resources that can be investigated to understand and validate the interactive behavior of our complex transportation infrastructure systems, including the use of underground space. Access the full report at: http://www.utrc2.org/sites/default/files/Final-Report-Metrics-Models-and-Data-for-Assessment.pdf

INTEGRATED INCIDENT MANAGEMENT SYSTEM (IIMS) WEB CLIENT APPLICATION DEVELOPMENT, DEPLOYMENT AND EVALUATION STATEN ISLAND (SI) DEMONSTRATION PROJECT

Principal Investigator(s): Dr. Elena Prassas
Institution(s): New York University (NYU)
Sponsor(s): New York State Department of Transportation (NYSDOT) & University Transportation Research Center (UTRC)

This evaluation report provides background on the development and findings. The aim of the UTRC project was to develop and deploy Portable IIMS based on Smartphone web applications. Previously, traditional IIMS was deployed in the field vehicles networked to central system. The transition from the vehicle-based IIMS to portable smartphones based applications has enhanced Stakeholders' experiences and ability to increase usage, and now ready for large-scale deployment. The users and stakeholders-agencies have concluded this effort as a success. Access the full report at:
http://www.utrc2.org/sites/default/files/Final-Report-Integrated-Incident-Management-System-Prassas.pdf

A GIS-BASED PERFORMANCE MEASUREMENT SYSTEM FOR ASSESSING TRANSPORTATION SUSTAINABILITY AND COMMUNITY LIVABILITY

Principal Investigator(s): Dr. Qian Wang, Dr Le Wang
Institution(s): State University of New York (SUNY)
Sponsor(s): University Transportation Research Center (UTRC)

Sustainability and livability in transportation, as the concepts referring to the capability of transportation systems to maintain the well-being of our society, have been widely accepted as the critical principles to improve quality of life and health of communities. The research developed a GIS-based performance measurement system for assessing the roles of transportation in achieving these goals. Using the City of Buffalo, New York as the case study, we collected various data and generated twenty sustainability and livability related performance measures (PMs), including the transportation attributes, land use measures, living condition indicators, and system-wide indices. The analysis on PMs derives several policy implications and suggestions. Lessons and challenges learnt from the PM development process were also summarized to help other relevant initiatives. The PMs, supporting database, case study and findings produced by the research are expected to help a wide range of audience such as policy makers, planners and transportation engineers to gain insights about the sustainability and livability oriented performance measurement.

Access the full report at:
http://www.utrc2.org/sites/default/files/Final-Report-A-GIS-Based-Performance-Measurement-System.pdf

INTEGRATED INCIDENT MANAGEMENT SYSTEM (IIMS) WEB CLIENT APPLICATION DEVELOPMENT, DEPLOYMENT AND EVALUATION: AN EVALUATION OF A POTENTIAL IIMS DEPLOYMENT IN WESTERN NEW YORK

Principal Investigator(s): Dr. Adel Sadek
Institution(s): State University of New York (SUNY)
Sponsor(s): New York State Department of Transportation (NYSDOT) & University Transportation Research Center (UTRC)

Incident Management (IM) is an area of transportation management that can significantly decrease the congestion and increase the efficiency of transportation networks in non-ideal conditions. In this study, the existing state of the Integrated Incident Management System (IIMS) is reviewed, additional user requirements and applications are identified, potential obstacles to successful deployment are discussed, and identification of future steps towards deployment in western New York are determined. This is done through working with incident management organizations, reviewing other existing systems, and researching the potential of IIMS through use of the system.

Access the full report at:
http://www.utrc2.org/sites/default/files/Final-Report-Integrated-Incident-Management-System-Sadek.pdf

THE ROLE OF SOCIAL MEDIA IN IMPROVING THE SAFETY AND EFFICIENCY OF TRAFFIC OPERATIONS DURING NON-ROUTINE EVENTS SUCH AS INCIDENTS AND PLANNED SPECIAL EVENTS

Principal Investigator(s): Jeffrey Wojtowicz, William (Al) Wallace, Jeff Ban
Institution(s): Rensselaer Polytechnic Institute
Sponsor(s): University Transportation Research Center (UTRC)

Social media has become an integral part of modern communication. There is however no clear consensus among transportation managers on how social media could or should be used to collect or disseminate actionable information. To provide guidance on the potential use of social media in transportation, a better understanding is needed of the message content as well as the path taken from the sender to the potential user of actionable information during crises and other non-routine events in the transportation system.

Access the full report at:
http://www.utrc2.org/sites/default/files/Final-Report-The-Role-of-Social-Media-in-Improving-Safety.pdf

POSSIBILITY OF SIDEWALL COLLAPSE OF UNDERGROUND STRUCTURES DUE TO LOSS OF LATERAL SUPPORT UNDER INTERNAL BLAST LOADING

Principal Investigator(s): Dr. Huabei Liu
Institution(s): City University of New York (CUNY)
Sponsor(s): University Transportation Research Center (UTRC)

For some immersed tube tunnels, the horizontal slab contributes to the structural integrity. If a train running on the slab were subjected to an explosion, which then failed a large area of the horizontal slab, the sidewall might yield under the lateral earth and water pressures. In this study, a three-dimensional Finite Element (FE) model was established to analyze the problem

Access the full report at: http://www.utrc2.org/sites/default/files/Final-Report-Possibility-of-Sidewall-Collapse.pdf

REVIEW OF ASSET HIERARCHY CRITICALITY ASSESSMENT AND RISK ANALYSIS PRACTICES

Principal Investigator(s): Dr. Mohsen A. Jafari
Institution(s): Rutgers University
Sponsor(s): Metropolitan Transportation Authority (MTA) & University Transportation Research Center (UTRC)

The MTA NYC Transit (NYCT) has begun an enterprise-wide Asset Management Improvement Program (AMIP). In 2012, NYCT developed an executive-level concept of operations that defined a new asset management framework following a systems engineering approach. NYCT has recognized the need for a fully developed asset hierarchy to enable the evaluation of performance and cost at different levels within the agency. To that end, NYCT has initiated this project as one of the initial steps in better understanding the state of the art in asset management.

Access the full report at: http://www.utrc2.org/sites/default/files/Final-Report-Review-of-Asset-Hierarchy-Criticality.pdf

CHARACTERIZING AND QUANTIFYING THE SHRINKAGE RESISTANCE OF ALKALI-ACTIVATED (CEMENT-FREE) CONCRETE AND EVALUATING POTENTIAL METHODS FOR REDUCING EARLY-AGE CRACKING IN PAVEMENTS AND BRIDGES

Principal Investigator(s): Dr. Sulapha Peethamparan
Institution(s): Clarkson University
Sponsor(s): University Transportation Research Center (UTRC)

This report summarizes the findings of an experimental investigation into shrinkage, and the mitigation thereof, in alkali-activated fly ash and slag binders and concrete. The early-age (chemical and autogenous) and later-age (drying and carbonation) shrinkage of sodium silicate-activated fly ash and slag binders was evaluated in accordance with relevant specifications. The influence of activator concentration and water content on the resulting shrinkage was investigated. The shrinkage behavior of alkali-activated binders and concrete was compared to that of ordinary Portland cement. Finally, the effectiveness of several common shrinkage-mitigation techniques on the early-age and later-age shrinkage of alkali-activated binders was evaluated.

Access the full report at:
http://www.utrc2.org/sites/default/files/Final-Report-Characterizing-and-Quantifying-Shrinkage-Resistance.pdf

INTEGRATION OF BUS STOP COUNTS DATA WITH CENSUS DATA FOR IMPROVING BUS SERVICE

Principal Investigator(s): Dr. Catherine T. Lawson
Institution(s): State University of New York (SUNY)
Sponsor(s): New Jersey Department of Transportation (NJDOT), Federal Highway Administration/USDOT & UTRC

This research project produced an open source transit market data visualization and analysis tool suite, The Bus Transit Market Analyst (BTMA), which contains user-friendly GIS mapping and data analytics tools, and state-of-the-art transit demand modeling microsimulation capabilities. BTMA combines both archived transit operations data (e.g., automatic fare-box data), and new open data resources, particularly GTFS and US Census.

Access the full report at: http://www.utrc2.org/sites/default/files/Final-Report-Integration-of-Bus-Stop-Counts-Data.pdf

INTEGRATING REAL-TIME GIS AND SOCIAL MEDIA FOR QUALITATIVE TRANSPORTATION DATA COLLECTION

Principal Investigator(s): Dr. Hongmian Gong, Carsten Kessler
Institution(s): City University of New York (CUNY)
Sponsor(s): University Transportation Research Center (UTRC), Federal Highway Administration/USDOT

New technologies such as global positioning system, smartphone, and social media are changing the way we move around. Traditional transportation research has overwhelmingly emphasized the collection of quantitative data for modeling, without much collection of qualitative data to understand the processes of why and how individuals make their travel choices. We developed a prototype in this project to use real-time GIS and social media (Twitter) to collect, analyze, and display qualitative travel information from individuals. There are two goals in this research project. One is to collect tweets from individuals to speculate the trip purposes of their travels. The prototype developed in this project collects tweets from volunteers and calculates the probabilities of their trip purposes from what they tweet about in Twitter. Another goal of this research is to display tweets on the web through real-time GIS. This would be very useful during emergency evacuations in extreme events such as 9/11 and Hurricane Sandy.

Access the full report at: http://www.utrc2.org/sites/default/files/Final-Report-Integrating-Real-time-GIS-and-Social-Media.pdf

REAL-TIME ESTIMATION OF TRANSIT OD PATTERNS AND DELAYS USING LOW COST UBIQUITOUS ADVANCED TECHNOLOGIES

Principal Investigator(s): Dr. Kaan Ozbay, Dr. Neveen Shlayan, Dr. Hani Nassif
Institution(s): New York University (NYU)
Sponsor(s): University Transportation Research Center (UTRC)

The main objective of this project is to develop and conduct limited testing of novel sensors using Bluetooth technology (BT) to estimate OD demands and station wait times for users of public transit stations. The NYU research team tested the feasibility of the utilization of sensors with Bluetooth technology to estimate Origin-Destination (OD) demands and station wait-times of users of transit systems with a focus on subway systems. For example, if the entrance and exit turnstiles at subway stations were equipped with this type of sensors, it is possible to capture OD information for some of the riders with activated devices.

Access the full report at: http://www.utrc2.org/sites/default/files/Final-Report-Real-Time-Estimation-Transit-OD-Patterns.pdf

MAJOR WORKFORCE CHALLENGES CONFRONTING NEW YORK CITY TRANSIT INDUSTRY

Principal Investigator(s): Lesley Hirsch, Pamela Hoberman, Ronnie Kauder
Institution(s): City University of New York (CUNY)
Sponsor(s): University Transportation Research Center (UTRC)

The purpose of this research was to identify the pressing workforce issues confronted by transit authorities nationwide and promising ways in which they are being addressed. The study also included a closer examination of New York City Transit (NYCT), the nation's largest transit authority, to consider its challenges and which solutions could be brought to bear to address them.

Access the full report at: http://www.utrc2.org/sites/default/files/Final-Report-Major-Workforce-Challenges.pdf

BROADBAND HYBRID ELECTROMAGNETIC AND PIEZOELECTRIC ENERGY HARVESTING FROM AMBIENT VIBRATIONS AND PNEUMATIC VORTICES INDUCED BY RUNNING SUBWAY TRAINS

Principal Investigator(s): Ya Wang
Institution(s): State University of New York (SUNY)
Sponsor(s): University Transportation Research Center (UTRC)

The airfoil-based electromagnetic energy harvester containing parallel array motion between moving coil and trajectory matching multi-pole magnets was investigated. The magnets were aligned in an alternatively magnetized formation of 6 magnets to explore enhanced power density. In particular, the magnet array was positioned in parallel to the trajectory of the tip coil within its tip deflection span. The finite element simulations of the magnetic flux density and induced voltages at an open circuit condition were studied to find the maximum number of alternatively magnetized magnets that was required for the proposed energy harvester.

Access the full report at: http://www.utrc2.org/sites/default/files/Final-Report-Broadband-Hybrid-Electromagnetic-Energy.pdf

FEASIBILITY ASSESSMENT FOR BATTERY ELECTRIC VEHICLES BASED ON MULTI-DAY ACTIVITY-TRAVEL PATTERNS

Principal Investigator(s): Jee Eun Kang, Anpeng Zhang, Changhyun Kwon
Institution(s): State University of New York (SUNY)
Sponsor(s): University Transportation Research Center (UTRC)

A Battery Electric Vehicle (BEV) feasibility considering State Of Charge (SOC) level is assessed using multi-day activity-travel patterns to overcome the limitations of using one-day activity-travel patterns. Since multi-day activity-travel patterns are not readily available, we generate multi-day activity-travel patterns through sampling from readily available single-day household travel survey data with considerations of day-to-day intra personal variability. One of the key observation we make is that the distribution of interpersonal variability in single-day travel activity datasets is similar to the distribution of intra-personal variability in multi-day datasets. Thus, interpersonal variability observed in cross-sectional single-day data of a large population can be used to generate the day-to-day intra-personal variability.

Access the full report at:
http://www.utrc2.org/publications/feasibility-assessment-battery-electric-vehicles-based-multi-day-activity-travel

QUANTITATIVE ANALYSIS OF RESIDENTIAL PARKING INTRUSIONS BY PASSENGER VEHICLES IN NEW YORK CITY

Principal Investigator(s): Dr. Zhan Guo, Dr. Jianhao Zhou
Institution(s): New York University (NYU)
Sponsor(s): University Transportation Research Center (UTRC)

This paper investigates the spatial patterns of residential parking intrusions in New York City, their determinants, and an estimated number and spatial patterns of induced excessive vehicle miles traveled (VMT). The paper analyzes parking tickets data with driver registration demographic data, and determines potential residential parking intrusions of passenger vehicles. Results show that significant clusters of intrusions are mainly located in almost all the residential areas of Manhattan, and some residential areas of Bronx, Brooklyn, and Queens.

Access the full report at: http://www.utrc2.org/sites/default/files/Final-Report-Quantitative-Analysis.pdf

IMPACTS OF FREIGHT PARKING POLICIES IN URBAN AREAS: THE CASE OF NEW YORK CITY

Principal Investigator(s): Dr. José Holguín-Veras
Institution(s): Rensselaer Polytechnic Institute
Sponsor(s): University Transportation Research Center (UTRC)

The research has tested several policy scenarios, and the practical implications of parking supply management is discussed. The results obtained help provide a better understanding of the need of freight parking and the policy alternatives available to improve the efficiency of urban freight systems. The results of the simulation provided the following insights related to which parking policies could be implemented to improve freight parking. While increased parking supply is not an easy feat, this would be a very effective policy that can decrease the average search time of trucks by 61%, shaving an average of 16 minutes of travel time off per delivery. This change would have important effects not only on freight traffic but also on other users of the transportation network.

Access the full report at: http://www.utrc2.org/sites/default/files/Final-Report-Impacts-of-Freight-Parking-Policies.pdf

HETEROGENEOUS REGIONAL SIGNAL CONTROL

Principal Investigator(s): Dr. Qing He
Institution(s): State University of New York (SUNY)
Sponsor(s): University Transportation Research Center (UTRC)

The goal of this project is to develop a comprehensive framework with a set of models to improve multi-modal traffic signal control, by incorporating advanced floating sensor data (e.g. GPS data, etc.) and traditional fixed sensor data (e.g. loop detectors, etc.). In order to accomplish this goal, we completed five tasks. First, we conduct a comprehensive survey with transportation professionals, who can bring up existing state-of-practice, open issues and future challenges in multi-modal traffic signal control.

Access the full report at: http://www.utrc2.org/sites/default/files/Final-Report-Heterogeneous-Regional-Signal-Control.pdf

A PROBABILITY-BASED APPROACH FOR ASSESSMENT OF ROADWAY SAFETY HARDWARE

Principal Investigator(s): Qian Wang, Hongbing Fang
Institution(s): Manhattan College, The University of North Carolina at Charlotte
Sponsor(s): University Transportation Research Center (UTRC)

This report presents a general probability-based approach for assessment of roadway safety hardware (RSH). It was achieved using a reliability analysis method and computational techniques. With the development of high-fidelity finite element (FE) models, numerical crash simulations can be performed to evaluate various RSH systems, in addition to crash tests. For highly nonlinear and implicit impact responses, metamodeling techniques provide a rational approach to replace the expensive numerical simulations. In this study, radial basis functions (RBFs) were employed to create approximation functions of limit state/performance functions using a relatively small number of sample points. Once the RBF metamodels were created, the failure probabilities were estimated using simulation methods such as Monte Carlo simulations (MCS). Based on the proposed approach, the failure probability can be obtained at different intensity measure (IM) levels, such as impact velocities.

Access the full report at: http://www.utrc2.org/sites/default/files/Final-Report-A-Probability-Based-Approach-Roadway-Safety.pdf

BUILDING A SENSE OF PLACE IN AN INFORMATION ERA: ACCESSIBILITY, CONNECTIVITY AND TRAVEL

Principal Investigator(s): Dr. Roger Chen, Ming Hu
Institution(s): Rochester Institute of Technology (RIT)
Sponsor(s): University Transportation Research Center (UTRC)

This research work examines the relationships among: (i) Sense of Places (SOP); (ii) non-motorized sustainable travel choices and accessibility; and (iii) adoption and use of information and communication technologies (ICT). A guiding principle in designing the built environment for sustainability and livability is the latent construct of Sense of Places (SOP) which leads visitors to perceive and associate a strong identity or character with a particular location.

Access the full report at: http://www.utrc2.org/sites/default/files/Final-Report-Building-a-Sense-of-Place.pdf

DISASTER RELIEF ROUTING UNDER UNCERTAINTY: A ROBUST OPTIMIZATION APPROACH

Principal Investigator(s): Dr. Sung Hoon Chung
Institution(s): State University of New York
Sponsor(s): University Transportation Research Center (UTRC)

This report addresses the capacitated vehicle routing problem (CVRP) and the split delivery vehicle routing problem (SDVRP) with uncertain travel times and demands when planning vehicle routes for delivering critical supplies to the affected population in need after a disaster. A robust optimization approach is used to formulate the CVRP and the SDVRP with uncertain travel times and demands for five objective functions: minimization of the total number of vehicles deployed (minV), minimization of the total travel times/travel costs (minT), minimization of the summation of arrival times (minS), minimization of the summation of demand-weighted arrival times (minD), and minimization of the latest arrival time (minL). The minS, minD, and minL are critical for deliveries to be fast and fair in routing for relief efforts, while the minV and minT are common cost-based objective functions in the traditional VRP. Access the full report at: http://www.utrc2.org/sites/default/files/Final-Report-Disaster-Relief-Routing.pdf

RISK ANALYSIS OF AUTONOMOUS VEHICLES IN MIXED TRAFFIC STREAMS

Principal Investigator(s): Parth Bhavsar
Institution(s): Rowan University
Sponsor(s): University Transportation Research Center (UTRC)

The objective of this study was to identify the risks associated with the failure of autonomous vehicles in mixed traffic streams and develop strategies to minimize these risks. Three distinct and interconnected phases were used to conduct the risk analysis; i) risk identification, ii) risk estimation and iii) evaluation. To identify the risks, the autonomous vehicle system was first disintegrated into vehicular components (i.e., sensors, actuators and communication platforms). Because an autonomous vehicle will share the roadways with human drivers for many years after their deployment, transportation infrastructure components play an important role in the final risk analysis.

Access the full report at: http://www.utrc2.org/sites/default/files/Final-Report-Risk-Analysis-of-Autonomous-Vehicles.pdf

EXPLORING APPLICATIONS FOR UNMANNED AERIAL SYSTEMS AND UNMANNED GROUND SYSTEMS IN ENHANCED INCIDENT MANAGEMENT, BRIDGE INSPECTION, AND OTHER TRANSPORTATION-RELATED OPERATIONS

Principal Investigator(s): Dr. Camille Kamga
Institution(s): City University of New York (CUNY)
Sponsor(s): New York State Department of Transportation (NYSDOT) & University Transportation Research Center (UTRC)

Unmanned aircraft systems (UAS) and unmanned ground systems (UGS) have the potential to change the way we perform some of transportation-related operations. Nowadays, opportunity arises to leverage various innovative technological capabilities to explore their use and value in real wor1d operating environments. Specifically, exploring the capabilities of UAS, also called drones, and UGS in specific transportation areas appears to have significant potential. This report summarizes the literature review, performed by students from three schools within the University Transportation Research Center Consortium, documenting applications and demonstrations of UAS and UGS technologies and potential deployment opportunities for NYSDOT in the near future. Specifically, NYSDOT would like to assess the existing capabilities of these systems for responding to highway incidents including field surveying, accident information collection and reconstruction and other related requirements to clearing a highway incident

Access the full report at:
http://www.utrc2.org/sites/default/files/Final-Report-Exploring-Applications-Unmanned-Aerial-Systems.pdf

ASSESSING NJ TRANSIT'S MOBILE APP FOR USER'S RECEPTIVENESS TO GEOTARGETING

Principal Investigator(s): Dr. Candace Brakewood, Dr. Robert Paaswell
Institution(s): City University of New York (CUNY)
Sponsor(s): New Jersey Department of Transportation (NJDOT), Federal Highway Administration/USDOT & UTRC

NJ TRANSIT customers can use a smartphone application ("app") to purchase tickets and access transit information Most smartphones are equipped with technology that can determine the user's location; however, this feature is currently used in a limited capacity in NJ TRANSIT's app. By knowing a customer's location, NJ TRANSIT could potentially provide customized information directly to passengers based on their location, which is referred to as geotargeting. The objective of this research project is to assess NJ TRANSIT passengers' receptiveness to geotargeting in NJ TRANSIT's mobile app. A three-part method was used. First, an industry scan of transit smartphone apps was conducted by downloading publicly available apps from four peer transit agencies. The results reveal that most of the peer transit agency apps are location aware; however, this functionality appears to be used in a limited number of features within the app, such as detecting a user's location when they request nearby real-time vehicle arrival information.

Access the full report at:
http://www.utrc2.org/sites/default/files/Final-Report-Assessing-NJ-Transit-Mobile-App-Geotargeting.pdf

USING MOBILE COMPUTERS TO AUTOMATE THE CHANGE ORDER PREDICTION COST FOR HIGHWAY CONSTRUCTION PROJECTS

Principal Investigator(s): Jose L. Perdomo
Institution(s): University of Puerto Rico at Mayaguez
Sponsor(s): University Transportation Research Center (UTRC)

Currently, UPRM is working on a mobile computing application for automating the collection process of field inspection data using iPads or Android Tablets. The application contains standard forms of the specifications that appear in the Standard Specification of Road and Bridge Construction book. Because of their high mobility characteristics and due to their small size and lightweight, these mobile devices can be used in the construction field to perform various tasks including development and evaluation of a change order and extra work.

Access the full report at:
http://www.utrc2.org/sites/default/files/Final-Report-Using-Mobile-Computers-to-Automate-Change.pdf

LONG-TERM INFILTRATION CAPACITY OF DIFFERENT TYPES OF PERMEABLE PAVEMENTS

Principal Investigator(s): Kirk R. Barrett, Ph.D.
Institution(s): Manhattan College
Sponsor(s): University Transportation Research Center (UTRC)

Permeable pavements such as porous asphalt, pervious concrete and permeable interlocking concrete pavers are relatively novel alternatives to conventional pavement that allow rain and snowmelt to infiltrate, thereby reducing runoff, flooding and nonpoint source pollution. A barrier to wider adoption of these runoff-reducing alternative pavements is uncertainty over their long-term performance. Infiltration capacity (IC) can decrease over times if pores in permeable pavement become clogged with particles. Indeed, several studies have found rapid reduction in infiltration from clogging [2-4], but other studied sites have maintained high IC for multiple years [2, 5-8]. The purpose of this project was to measure IC on three different types of permeable pavement: porous asphalt (PA), pervious concrete (PC) and permeable interlocking concrete pavers (PICP). Combined with previous results [1], the results from this project provide further understanding of how IC changes over time in different types of permeable pavements.

Access the full report at: http://www.utrc2.org/sites/default/files/Final-Report-Long-term-Infiltration-Capacity.pdf

SECURE AND PRIVATE SENSING FOR DRIVER AUTHENTICATION AND TRANSPORTATION SAFETY

Principal Investigator(s): Jonathan Voris, Ph.D., Sertac Artan, Ph.D., Wenjia Li, Ph.D.
Institution(s): New York Institute of Technology
Sponsor(s): University Transportation Research Center (UTRC)

Recent technology trends have allowed affordable and efficient collection of driver data. This has enabled a variety of potential applications, including more accurate pricing determinations for insurance and finer grained traffic planning for improved public safety. Although this technological growth provides for a wealth of new opportunities, given the safety implications of driving, there are many security and privacy issues that must be considered for their deployment. For instance, some applications require access to a vehicle's engine via a debug interface, known as On-Board Diagnostics (OBD-II), which may provide a vector for attack. Other systems may involve GPS tracking, which can potentially violate a driver's privacy. Our research seeks to find solutions to these shortcomings by using local sensing and monitoring to support the development of new driver devices and applications, such as driver authentication, while preserving vehicular security and privacy.

Access the full report at:
http://www.utrc2.org/sites/default/files/Final-Report-Secure-and-Private-Sensing.pdf

INNOVATIVE TECHNIQUES FOR MAINTENANCE REPAIR AND RECONSTRUCTION (MRR) OF ASPHALT ROADWAYS

Principal Investigator(s): Baris Salman, Ph.D., O. Sam Salem, Ph.D.
Institution(s): Syracuse University
Sponsor(s): University Transportation Research Center (UTRC)

Highway networks in the United States have been suffering from poor operational and structural condition states for the past decades. The consequent congestion problems often result in major delays, safety issues, and large amounts of additional fuel consumption and greenhouse gas emissions. With limited funding available, transportation agencies are placing more emphasis on maintenance, repair, and reconstruction (MRR) practices in order to preserve and restore roadway conditions. Innovative MRR techniques have proved effective or shown great potential in addressing problems associated with poor condition levels of aging asphalt roadway infrastructure with reduced economic, social, and environmental impacts.

Access the full report at:
http://www.utrc2.org/sites/default/files/Final-Report-Innovative-Techniques-for-Maintenance-Repair-Reconstruction.pdf

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