



REGION II
UNIVERSITY TRANSPORTATION
RESEARCH CENTER

REGION II
New York., New Jersey,
Puerto Rico, Virgin Islands

Marshak Hall Room 910
The City College of NY
New York, NY 10031

Tel: 212-650-8050
Fax: 212-650-8374
Website: www.utrc2.org

PROGRAM PROGRESS PERFORMANCE REPORT

*Submitted to the Office of the Assistant Secretary for Research
and Technology*

Federal Grant # DTRT13-G-UTC32

Project Title: University Transportation Research Center – Region 2

Name of Grant: University Transportation Center

Program Director: Camille Kamga, Ph.D, Director UTRC, Assistant Professor of
Civil Engineering, The City College of New York, ckamga@utrc2.org, 212-650-8087

Submitting Official: Penny Eickemeyer, peickemeyer@utrc2.org, 212-650-8074

Submission Date: April 30, 2016

DUNS: 064932676

EIN: 13-1988190

Recipient Identifying Number or Account Number: 49198-26

Project/Grant Period: Start Date: September 30, 2013 End Date: September 30, 2017
Reporting Period Start Date: October 1, 2015

Reporting Period End Date: March 30, 2016

Report Term or Frequency: six months

Signature _____

Penny Eickemeyer, Associate Director for Research, UTRC

CONSORTIUM MEMBERS

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, Polytechnic Institute of NYU, Rochester Institute of Technology, Rowan University, Rensselaer Polytechnic Institute, Rutgers University*, State University of New York, Stevens Institute of Technology, Syracuse University, The College of New Jersey, University of Puerto Rico

*Member under SAFETEA-LU Legislation

Table of Contents

1. ACCOMPLISHMENTS	2
A. GOALS AND OBJECTIVES:	2
B. ACCOMPLISHMENTS UNDER THESE GOALS:	2
a) <i>Research</i>	2
b) <i>Education and workforce development</i>	11
c) <i>Technology Transfer</i>	12
C. DISSEMINATION OF RESULTS:	14
D. PLANS FOR NEXT REPORTING PERIOD:	14
2. PRODUCTS	15

This report will cover UTRC's three mission areas: Research, Technology Transfer, and Education for activities that occurred under the Grant# DTRT13-G-UTC32 during this reporting period.

1. ACCOMPLISHMENTS

A. Goals and objectives

- a) Research: To support the USDOT Strategic Goals and to advance the state of practice in planning and management of regional transportation systems; the research program consists of both agency-initiated and faculty-initiated studies
- b) Education and workforce development: To improve the knowledge base and approach to problem solving of the region's transportation workforce
- c) Technology transfer: To increase the awareness and level of information concerning transportation issues facing Region 2 to the education, research and practicing community; disseminate project reports, studies, analysis, and use of tools to the community; and provide unbiased information and testimony to decision-makers concerning regional transportation issues consistent with the UTRC theme.

B. Accomplishments under these goals

a) Research

Continuing Research Projects

- An Agent-Based Disaster Response Inference Model for Assessment of Transportation Risk under Extreme Events (CCNY)
- An Examination of Commercial Vehicle Access to Residential Buildings in New York City (CCNY)
- A Probability-Based Approach for Assessment of Roadway Safety Hardware (Manhattan College)
- Assessing NJ Transit's Mobile App for Users' Receptiveness (CCNY/NJDOT)
- Building a Sense of Place in an Information Era: Accessibility, Connectivity and Travel (RIT)
- CIDNY Task 2 - Develop a multi-agency/multi modal construction management tool (Polytechnic Institute of NYU, CCNY)

- CIDNY Task 5 - Develop a Comprehensive Guide to Signal Timing, New Detection and Advanced Signal (Polytechnic Institute of NYU, University at Buffalo)
- CIDNY Task 6 - Strategic ITS Deployment Plan for New York City (CCNY, Stony Brook University)
- CIDNY Task 7 - Research on Pedestrians and Cyclists Safety Using ITS Technology in NYC (Polytechnic Institute of NYU)
- CIDNY Task 8 - Develop Data Storage and Access Platform for MTA Bus Time Data (Polytechnic Institute of NYU)
- Computational Synthesis of High-Performance Non-Pneumatic Tires (Stony Brook University)
- Developing A Macroscopic Decision Making Tool For Emergency Evacuation Planning (RPI)
- Development of a New, Effective and Low-cost Media for Sustainable Management of Polluted Road Storm-water in Highly Urbanized Areas (Manhattan College)
- Do Consumer Expenditures Affect Demand for Driving (Cornell)
- Developing Generalized Linear Mixed Models For The Strategic Highway Safety Planning Process (UPR)
- Development of a new connected eco-driving system at signalized intersections with adaptive signal (Polytechnic Institute of NYU)
- Disaster Relief Vehicle Routing Under Uncertainty (Binghamton University)
- Efficacy of the Bacteria Encapsulation Concrete Self-Healing Method in a Harsh Environment (Manhattan College)
- Hosting, maintenance and support for NYMTC PIMS (NJIT) of NYS Infrastructure Assets (Cornell)
- Evaluating the Impacts of Real-Time Information on Subway Ridership in New York City (CCNY)
- Heterogeneous Regional Traffic Signal Control (SUNY at Buffalo)
- Improving Cross-Frame Design to Reduce the Effects of Skew in Steel I-Girder (TCNJ)
- Hunts Point Terminal Market: The Feasibility of Waterborne Transportation (SUNY Maritime, CCNY/ NYSERDA)
- Impact of Polymer Modification on Mechanical and Viscoelastic Properties of Binders (Rowan)
- Induced Emissions and Energy Use in Transportation: Use of Social Media Feeds as an IM Support Tool (CCNY, Stony Brook University/ NYSERDA)
- Innovative Techniques for Maintenance, Repair and Reconstruction (MRR) of Asphalt Roadways (Syracuse University)
- Innovative Travel Data Collection - Planning for the Next Two Decades (University at Albany/ NYMTC)
- Intelligent Wireless Charging for Electric Buses in Smart City (Columbia)

- Investigating Temporal Effects on Truck Accident Occurrence and Severity Level in NYC (RPI)
- Measuring Parking Intrusion in New York City Neighborhoods using Parking Tickets and Vehicle Plate Registration Data (NYU)
- Market Potential For Battery Electric Vehicles Based On Multi-Day Activity-Travel Patterns (University at Buffalo)
- Monitoring Infiltration Capacity of Different Types of Permeable Pavement (Manhattan College)
- Nano-modified geopolymers for concrete infrastructure rehabilitation (Stony Brook University)
- Optimizing Work Zone Lighting (RPI/NJDOT)
- Public Transit and Mandatory Evacuations Prior to Extreme Weather Events in New York City (NYU)
- PPS-AQ and PPS-CMP hosting, maintenance, backup and technical support (Cornell/NYMTC)
- Regional Financing Options Study (CUNY,CSI/NYMTC)
- Risk analysis of autonomous vehicles in mixed traffic streams (Rowan)
- Secure and Private Sensing for Driver Authentication and Transportation Safety (NYIT)
- Self-Heated Pavements (Stony Brook University)
- Smart Bus System under Connected Vehicles Environment (NJIT)
- Spectral Based Controllability-preserving Pedestrian Evacuation Network Synthesis Using Multilayered Estimation Models in Real-time (SUNY Maritime)
- Technical Support for Use of National Performance Management Research Data Set (SUNY at Albany/NYS DOT)
- Transportation Infrastructure Robustness: Analysis and Measurement (CCNY)
- Understanding Transit Finance: An Analysis of Transit Funding Around the World (Columbia)
- Using Mobile Computers to Automate the Change Order Decision Making Process and Improve Total Time and Cost Predictions on Highway Construction Projects (UPR)
- Worker Safety Issues of WiFi Devices (TCNJ/NJDOT)

Projects continuing during this reporting period: Status of ongoing research

Projects under this grant continued.

Several final reports, particularly from projects begun in 2014 have been submitted.

Final Reports submitted:

- Alkali Silica Reaction (ASR) in Cement Free Alkali Activated Sustainable Concrete (Clarkson)
- Analysis of Energy Efficient Highway Lighting Retrofits (RPI/NYS DOT)

- Analysis of Curved Weathering Steel Box Girder Bridges in Fire (Manhattan College)
- Analyzing Willingness to Improve the Resiliency of New York City's Transportation System (Cornell)
- Characterization and Modeling of Photon Absorption in Asphalt Materials (Columbia University, Manhattan College)
- Effective and Equitable Supply of Gasoline to Impacted Areas in the Aftermath of a Natural Disaster, (SUNY Buffalo)
- Evaluating the Role of Private Investment in Life Cycle Management of New York State's Infrastructure Assets (Cornell)
- Environmental Impacts of Oil and Gas Brine Applications for Dust and Ice Control in New York (Manhattan College) – draft report in
- Impact of Polymer Modification on Mechanical and Viscoelastic Properties of Binders and Hot Mix Asphalt (Rowan)
- Traffic Prediction Using Wireless Cellular Networks (NYIT)
- Modeling of Photon Absorption in Asphalt Materials for Improved Accuracy (Columbia)

Examples of Activity this period:

Agency-sponsored

NJDOT

- **Drainage Identification Analysis and Mapping, Phase 2 (NJIT)**
Phase II consists of three specific objectives, specifically to: rectify the compatibility issue related to the recent upgrades of NJDOT vendor software updates, update all collected data to make DIAMS current and link DIAMS to the NJDOT Video inspection van. Work continued on software enhancements for NJDOT's Drainage Identification, Analysis and Mapping System (DIAMS) Project.

NYCDOT/NYS DOT

- **CIDNY- Coordinated Intelligent Transportation Systems Deployment in New York City**
(FHWA-sponsored) Quarterly meetings were held in January for each task (project). Research is ongoing and meetings with stakeholder groups have been initiated. Each CIDNY project, listed as a separate task, is described below.

Task 2- Develop a multi-agency/multi modal construction management tool (Polytechnic Institute of NYU, CCNY)

The objective of this research project is the evaluation of the Construction Impact Analysis (CIA) tool designed and developed by Washington State Department of Transportation (WSDOT). Progress was made on Task 1, the Current NYCDOT Work Zone and Emergency Coordination Practice,

by continuing interviews with Transcom, PANYNJ, and MTA NYCT. The draft final report for Task 3, Review the Construction Impact Analysis (CIA) and The Work Zone Impact and Strategy Estimator (WISE) Tools was completed and will be submitted to the sponsor.

Task 5- Develop a Comprehensive Guide to Signal Timing, New Detection and Advanced Signal (Polytechnic Institute of NYU, University at Buffalo)

This project is to develop a comprehensive guide to signal timing, new detection technologies and advanced signal timing concepts applicable in New York City.

Task 6 – Strategic ITS Deployment Plan for NYC (CCNY, NYU)

This project is to review and update the strategic ITS Deployment Plan for New York City regarding three key areas required for ITS deployment in the City: NYCDOT ITS Implementation Strategy, the NYCDOT Five-Year ITS Deployment Plan and the NYC Sub-Regional ITS Architecture (NYCSRA).

Task 7- Pedestrians and Cyclists Safety Using ITS Technology in NYC (NYU)

The objective of this task is to research various ITS technologies for implementation in NYC for bike and pedestrian safety and make recommendations about where and when they should be placed. At the request of the NYCDOT, a literature review was undertaken on LPI (Lead Pedestrian Interval) signals. The research team met with NYCDOT to agree on APS (Accessible Pedestrian Signals) enhancement testing, smart phone application, tactile map, and extended press function. They also met with experts to gather information on technologies outside NYC. Recommended candidate test locations for tactile maps.

Task 8- Develop Data Storage and Access Platform for MTA BusTime Data

This project has three main objectives:

1. Develop efficient data acquisition, storage, maintenance and querying procedures to automate and improve the overall process of using MTA bus data.
2. Create a web-based application that take advantage of the MTA's on-going in house data development efforts as well NYU CUSP's extensive resources and expertise in the area of big data management.
3. Provide recommendations to incorporate this developed app and its functionalities into existing NYCDOT protocols and operations.

NYSERDA

- **Feasibility of Waterborne Distribution at Hunts Point Terminal Market**

Kickoff meeting, site visit and initial survey has been developed.

UTRC-sponsored:

Enhancing understanding of the economic impacts of transportation investment

- **Do Consumer Expenditures Affect the Demand for Driving?(Cornell)**

The objective of this project is Researchers have collected national data, available back to 1936 and back to 1980 at the state level. They are also looking at data from survey of consumer finances back to 1955. During this period a paper has been submitted for review and a new one has been conceptualized. The researchers also continued with data cleaning.

System modernization through implementation of advanced and information technologies

- **Building a Sense of Place in an Information Era: Accessibility, Connectivity and Travel (RIT)**

This research examines the relationships among: (i) sense of place; (ii) non-motorized sustainable travel choices and accessibility; and (iii) adoption and use of mobile information and communication technologies (ICT).

The onsite sense of place survey at the three sites has been completed and preliminary analysis has been completed. One delay was with the built environment audit. Since students would need to spend 3-4 hours outside taking measurements, we needed to wait for the weather to be mild to begin this task. Once the weather is warm, this should only take 3 weeks.

- **Heterogeneous Regional Signal Control (Buffalo)**

One critical task in regional traffic signal operations is how to establish different objectives and policies for varying arterial or subnetwork types. A typical urban network usually consists of different subnetwork types, such as central business district (CBD), suburban areas, and rural areas. The heterogeneous objective naturally arises for traffic signal operations on such different subnetworks.

There is little in the literature that explicitly addresses the signal control problem in heterogeneous subnetworks. Most of the previous work focuses on multi-objective control in the entire network, single objective control (e.g. network delay) across different regions, or across different traffic modes. The objective of this project is to develop a mathematical framework to model a heterogeneous objective traffic signal control for different subnetworks, assuming a data rich environment is already

established. The researchers consider the proposed multi-objective signal optimization model as a problem of Multidisciplinary Design Optimization (MDO), which has been widely implemented in automobile and aircraft design, and involves interactions among several disciplines. We will also leverage most recent research findings in urban area traffic control with Macroscopic Fundamental Diagram (MFD), which provides a general rule to control traffic within the capacity of network flow. During this reporting period, the researchers finished a VISSIM simulation model for 50 intersections in Manhattan, which is the test bed.

- **Smart Bus System under Connected Vehicles Environment ()**
This research proposes a Smart Bus System (SBS) powered by bus-to-device wireless communications technology including, but not limited to, 3G, 4G/LTE, Wi-Fi, Dedicated Short Range Communications (DSRC), and Bluetooth. SBS is an innovative urban bus operation system integrated with Information Technology (IT) to enhance the efficiency of bus operation, to encourage bus ridership, and to improve the mobility and sustainability of urban transportation. SBS enables 1) a bus to take a shorter path to catch up the schedule when it is behind the schedule and no passengers need to get off or get on and 2) passengers to send a hold request so that the next transfer bus, if at all possible, waits for the transfer passenger. The proposed project will be initially conducted within a simulation environment realizing actual hardware devices such as traffic signal controller, mobile devices (e.g., smartphone, tablet PC), and virtual transit management center. The goal of this project is to demonstrate that the proposed innovative Smart Bus System can improve transit system reliability and increases ridership. The increased bus ridership likely decreases the number of passenger cars on roadway, thereby resulting in the improvement on mobility and air quality and fuel consumption. Thus, the potential benefits of the smart bus system will be gained from the aspects of both mobility and environment. During this quarter a literature review was completed, the Con-Op, simulation test-bed, virtual smart bus management center, dynamic route adjustment application, and the smart transfer applications were developed.

Planning, monitoring, and implementation of communications and other technologies to understand and improve multi-modal transportation safety

- **Risk Analysis of Autonomous Vehicles in Mixed Traffic Streams**
The evolution in computing, communication and vehicular technologies has resulted in connected and autonomous vehicles. Due to its potential of significantly reducing highway crashes, fatality rates and improving quality of life, the autonomous vehicles are viewed as the next revolution in the transportation system by both private sector and public agencies. As the National Highway Transportation Safety Administration (NHTSA)

moves towards mandating vehicle-to-vehicle (V2V) connectivity for new vehicle models in the next few years, automotive industries are now increasing their efforts to develop V2V enabled vehicles. During this reporting period, the research team updated the preliminary fault tree of autonomous vehicle crash risk due to failure of autonomous vehicle.

Infrastructure design, monitoring, inspection, and management to ensure a State of Good Repair

- **Transportation Infrastructure Robustness: Analysis and Measurement**

Given the limited resources available to develop and maintain the Nation's infrastructure, developing non-subjective measures of robustness is essential for establishing benchmarks that can help policymakers prioritize the allocation of funds in ways that yield the highest economic returns per investment dollar. However, currently there is no consensus among researchers and stakeholders on an acceptable and non-subjective measure of infrastructure robustness. The development of such a measure, which combines engineering and economic factors, is the prime objective of this research. To date, the engineering team has analyzed bridge surface deterioration over time. It has identified key contributing factors and has quantified them by developing a deterioration index. The economic team has developed the economic model, which uses as input the facility's deterioration index and uses it to estimate longitudinal decline in travel and its welfare implications. Both teams have been collecting real-world data of a key facility – the George Washington Bridge – and will next use these data to estimate parameters of the engineering and economic models.

- **Innovative Techniques for Maintenance, Repair, and Reconstruction (MRR) of Asphalt Roadways (Syracuse)**

The objective of this project is to 1) investigate various innovative maintenance, repair, and reconstruction techniques that can be used to improve condition levels of asphalt roadways in consideration of economic, social, and environmental impacts, 2) identify the important factors that affect the decision making procedures for selecting the most appropriate maintenance, repair, and reconstruction technique for asphalt roadways, and 3) develop a high-level decision support tool that will allow evaluation of maintenance, repair, and reconstruction alternatives for asphalt roadways.

Work this quarter included summarizing the information collected through literature review and surveys. The research team is also working on integrating all findings in a comprehensive report.

- **Using Mobile Computers to Automate the Change Order Prediction Cost for Highway Construction Projects (UPR)**

The mobile app developed originally under the UTRC project, *Automating the Reporting and Progress Monitoring Process using Mobile Computers for Highway Construction Projects* was designed to assist with the quality control of highway construction and the app is now undergoing enhancements for increased control. The new UTRC project listed here will provide an extension to the application by automating the prediction of the project cost by the implementation of change orders and extra work in highway construction projects. The proposed prediction models will allow officers, along the decision making chain of command, to consider not only the technical aspects of a required change order, but also, the opportunity cost of their timely decision. Assessing the value and effect in time and cost of a change order process in advance of its approval could be beneficial in the sense that involved parties could decide that the change order is not necessary. Moreover, owner representatives could assess the impact in the project schedule that the delay in approving the change order could represent.

Work this period included initiating an extensive literature review to provide researchers an adequate background of the topic. Also, data regarding the current practices held by the local DOT has been collected. The team is already in the analysis process of the data collected. This analysis includes the identification of the factors that affect the highway construction projects in terms of time and cost extensions. Different mathematical prediction approaches are under evaluation to develop the proposed models. Once this analysis has been done, the research team will begin the automation process of the prediction models developed.

Securing transportation systems and improving planning for and response to extreme events

- **Developing a Macroscopic Decision Making Tool for Emergency Management**

Discussions were held with the NYC Office of Emergency Management to discuss project progress and seek feedback. Data collection has begun.

- **Public Transit and Mandatory Evacuations Prior to Extreme Weather Events in NYC**

This project is to evaluate public transit services in areas considered to be at high risk for flooding in New York City and to provide a tool that can help transportation planners and city officials improve these services during evacuations. The research will also look at the characteristics of public transit in Zone 1 evacuation areas in relation to the socioeconomic characteristics of the communities that live there.

A literature review has continued during this quarter. Most of the databases for hazard zones, flooding and evacuation centers have been identified and coded. The spreadsheet for analysis has advanced during this quarter. The graduate student researcher hired who started September 1, 2015 is continuing work on the project.

In addition, the PI has participated in several presentations on this topic such as:

- January 10, 2016. R. Zimmerman, Panel organizer, moderator, speaker. Critical Transportation Infrastructure Protection Committee (ABR10) Workshop 111, Panel 2: Physical Security: Why It's Critical to Resilience. Presentation: "Physical Security: New Emerging Needs and Innovations," Transportation Research Board Annual Meeting, Washington, DC.
 - February 25, 2016. "Promoting Resilient Services to Adapt to Climate Change and Extreme Events: Research Initiatives," Urban Planning Program faculty research presentation for urban planning students.
 - Also, preliminary information from the project has been integrated into the urban planning course taught by the PI, titled "Planning for Emergencies and Disasters."
- **Disaster Relief Vehicle Routing under Uncertainty (emerging scholar)**

The research team (PI and the undergraduate student, Sara Kohtz) completed the literature review, and model and algorithm development. A conference paper was presented, model development, algorithm development and preliminary results were all produced during this reporting period. A journal paper is expected to be submitted during the next reporting period.

b) Education and workforce development

During this period, UTRC accomplished the following:

- *NYMTC/UTRC September 11th Memorial Program Academic Initiative:*
 - Interns are continuing with their projects. Di Liu (NYU) has an internship at the NYMTC office to develop an action plan to link environmental and transportation planning
 - Sabihehal Faghih (CCNY) has an internship at the NYMTC office for analysis of the challenges of conducting surveys for activity-based travel demand models
 - Planning for the 2016-17 program (11th year for September 11th program) has begun: subcontract for NYMTC/UTRC

has been drafted, application has been posted on the UTRC website, and offerings for internship positions have been provided.

- *Advanced Institute for Transportation Education (AITE):*
 - Five internships are underway for 2015-16
 - Between October and March the 2016 recipients have been fulfilling the requirements (GPA, enrollment of Transportation Master degree) to continue receiving the scholarship.

c) Technology transfer

- *The following events were held during this reporting period.*
 - *NJDOT Technology Transfer Presentations*
NJDOT Technology Transfer presentations continued. Presentations made by UTRC faculty at NJDOT headquarters during this reporting period included:

Date	Topic	PI(s)	Institution(s)
October 8, 2015	Applications on Unmanned Aircraft Systems (UAS) for transportation operations	Lawrence H. Brinker, Esq	Executive Director & General Counsel at Northeast UAS Airspace Integration Research Alliance

- Dr. Susan Shaheen, co-director of the Transportation Sustainability Research Center (TSRC) of the Institute of Transportation Studies at the University of California (UC), Berkeley.
Dr. Shaheen presented at the UTRC Visiting Scholar Seminar on October 9, 2015 at the SUNY Global Center. Dr. Shaheen is also an adjunct professor in Civil and Environmental Engineering at UC Berkeley who has studied the social and environmental impacts of shared mobility for over 15 years. The event explored innovation and disruption in urban mobility. Dr. Shaheen examined trends, recent developments, and the impacts of new forms of mobility services, such as carsharing, bikesharing, ridesharing, and ridesourcing (e.g., UberX, Lyft, and Sidecar) She has More information on the event is available at this link: www.utrc2.org/events/innovation-disruption-urban-mobility
- Transportation Camp 2015, Nov.14, 2015
The event was hosted by the Young Professionals in Transportation and

the University Transportation Research Center.

The goal was to assemble planners, software developers, engineers, students, dreamers, and professionals for an exciting day of “un-conferencing.” The specific session topics were determined by participants, which provided each attendee an opportunity to lead and shape the event. Approximately 550 delegates were in attendance.

- **Transportation Technology Symposium: Innovative Mobility Solutions, November 20, 2015**
UTRC hosted the 3rd Annual Transportation Technology Summit on November 20, 2015 at the New York Institute of Technology. This unique summit brought together leading experts, academics, practitioners, industry stakeholders and advocates to discuss the rapidly changing and expanding world of transportation technology, innovative solutions, and public policy-making implications.
- **Fourth Connected and Autonomous Vehicles Symposium, Dec. 2, 2015**
This event took place at the SUNY Polytechnic (Poly) Institute in Albany, NY on December 2, 2015. The theme was Innovative Applied Research and Deployment Opportunities. Registrations were the greatest to date with approximately 200 attendees. The Internet of Things (IoT) universe of devices, connectivity and big data were discussed.
- **ITS Travel Information Systems and Mobile Applications for Enhanced Transport**
The workshop “ITS Travel Information Systems and Mobile Applications for Enhanced Transportation,” was held December 10, 2015. More than 100 professionals attended the event, including representatives from NYCDOT, NYSDOT, NJ Transit, MTA, Port Authority of NY & NJ as well as consultants, engineering firms and members of academia. Speakers’ presentations addressed the wave of innovation in ITS and apps for mobile devices, which are transforming the way traffic and transit data are communicated to customers in real time.
- **Book Talk: Road Traffic Congestion: An examination of the causes, consequences and possible solutions, February 26, 2016.**
- **ITE Met Section in coordination with UTRC hosted a ½ day summit on Smart Cities and Transportation on March 30, 2016 at NYIT.** More than 200 professionals attended the summit to share knowledge, exchange ideas, and to network. Technology, city planning, and transportation have merged at the intersection of Smart Cities. This half-day summit was organized to provide the attendees with a glimpse of Smart Cities and how the Transportation field is adapting to this changing environment.

- *Newsletter publications, “Research News,” released Fall 2015*

d) Opportunities for Training and Development

Our seminars and workshops are designed to educate the transportation community on current issues in policy and best practices as well as foster meaningful discussion on these topics. We also provide funding to the September 11th Memorial Program to select current students to serve in internship positions in regional and local agencies to enhance their educational experience.

- NYSAMPO

UTRC, through the CUNY School of Professional Studies is continuing to develop and offer courses per NYSAMPO’s needs for training of staff from MPOs throughout New York State. At this time, we are developing two online courses in areas identified by NYSAMPO: Personnel Management and Managing Web Content & Effective Visualization Techniques. The courses will have both synchronous and asynchronous components and will accommodate up to 50 learners. Needs assessment activities, which will include interviews with identified employees in 5-6 of the MPO offices, will start soon.

C. Dissemination of results:

- Quarterly Reports on project progress
- Completed final reports

D. Plans for next reporting period:

- **Video clips** on completed projects are expected to be posted during the next reporting period. These projects include:
 - Dr. Cara Wang: Assessing Behavior Changes Under The Influence of Travel Demand Management Strategies.
 - Dr. Jeffrey Wojtowicz: 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
 - Dr. Jeff Ban: Network System Effects of Mileage Fee
 - Dr. John Bullough: Analysis of Energy Efficient Highway Lighting Retrofits
 - Dr. Yusuf Mehta: Impact of Polymer Modification on Mechanical Viscoelastic Properties

Upcoming Events:

Transportation Transformed: Advancing Eco-friendly Mobility, April 7, 2016

Nexus of Roads and Water Resources: Emerging Issues for Water Storm

Water Management-at Manhattan College, April 12, 2016

2. PRODUCTS

None at this time.

3. Participants and Collaborating Organizations						
Partner (University)	Agency Sponsor	Location (see attached)	Project(s) (# funded)	Contribution	Other Collaborators	Role
NYU	N/A	New York, NY	Faculty-initiated-3	research		
NYU		New York	1	Tech Transfer		
NYU	NYCDOT, NYSDOT	New York, NY	Agency initiated-3	Research, CIDNY	CCNY(1), UB(1)	research
RIT	N/A	Rochester, NY	Faculty-initiated-1			
Rowan University		Glassboro, NJ	Faculty initiated-2	research		
RPI	NYSDOT NJDOT	Troy, NY	Faculty-initiated-2, agency-2	research		
SUNY:						
Albany	NYMTC	Albany, NY	Agency-initiated-1	research		
Buffalo		Buffalo, NY	Faculty-initiated-4	research		
Binghamton		Binghamton, NY	Faculty-initiated-1	research		
New Paltz		New Paltz, NY	Faculty-initiated-1	research		
Stonybrook	N/A	Stonybrook, NY	Faculty-initiated-2	research		
Stonybrook	NYSERDA	Stonybrook, NY	Agency-Initiated-2	research	CCNY	research
Maritime	NYSERDA	Throggs Neck, NY	Agency-initiated-1	Research	CCNY	research
Maritime	N/A	Throggs Neck, NY	Faculty-initiated-1	Research		
Stevens Institute of Technology	N/A	Hoboken, NJ				

3. Participants and Collaborating Organizations						
Partner (University)	Agency Sponsor	Location (see attached)	Project(s) (# funded)	Contribution	Other Collaborators	Role
Syracuse		Syracuse, NY	Faculty -initiated-1	research		
The College of New Jersey	NJDOT	Trenton, NJ	Agency-initiated-1	research		
The College of New Jersey		Trenton,NJ	Faculty-initiated-1	research		
University of Puerto Rico	N/A	Mayaguez PR	Faculty-initiated-2	research		
Agency Partners:						
NYSERDA		Albany, New				
NYMTC		New York, NY				
NYMTC		New York, NY				
NYSDOT		Albany, NY				
NJDOT		Ewing, NJ				
NYCDOT		New York, NY				
Port Authority of NY and NJ		New York, NY				
ITS-New York						

<u>Partner</u>	<u>Street</u>	<u>City, State, Zip</u>
Clarkson	8 Clarkson Avenue	Potsdam, NY 13699
Cornell	Cornell University	Ithaca, NY 14853
CCNY	160 Convent Avenue	New York, NY 10031
John Jay College	524 W. 59th Street	New York, NY 10019
Queens College	65-30 Kissena Blvd	Flushing New York 11367
CUNY Graduate Center	365 5th Avenue	New York, NY 10016
NYIT		
NJIT	323 Martin Luther King Blvd	Newark, NJ 07103
NYU	726 Broadway #350	New York, NY 10003
NYU/POLY	6 Metrotech Center	Brooklyn, NY 11201
RPI	110 8th Street	Troy, NY 12180
RIT	One Lomb Memorial Dr	Rochester, NY 14623
Rowan	201 Mullica Hill Rd	Glassboro, NJ 08028
SUNY Binghamton		
SUNY Buffalo	12 Capen Hall	Buffalo, NY 14260
SUNY New Paltz		
Stony Brook	100 Nicolls Rd	Stonybrook, NY 11794
SUNY Maritime	6 Pennyfield Avenue	Throggs Neck, NY 10465
Stevens Institute of Technology	9th Street	Hoboken, NJ 07030
Syracuse University	303 University Pl #335	Syracuse, NY 13244
University of Puerto Rico	Puerto Rico, 65	Mayaguez 00860
Agencies:		
NYSDOT	50 Wolf Road	Albany, New York 12205
NYSERDA	17 Columbia Circle	Albany, New York 12203-6399
NYMTC	199 Water Street	New York, New York 10038
NYCDOT	55 Water Street	New York, New York 10041
NJDOT	1035 Parkway Avenue	Trenton, NJ 08625
NYCDOT	55 Water Street	New York, NY
PANYNJ	225 Park Avenue South	New York, NY 10003
ITS-NY	14 Loveland Court	Cranbury, NJ 08512
NYCT	2 Broadway	New York, NY 10004

Projects by Partner

<u>Partner</u>	<u>Projects</u>						
USC/Volvo							
Clarkson	Alkali Silica Reaction (ASR) in Cement Free Alkali Activated Sustainable Concrete						
Columbia	Characterization and Modeling of Photon Absorption in Asphalt Materials	Understanding Transit Finance: An Analysis of Transit Funding Around the World	Intelligent Wireless Charging for Electric Buses in Smart City				
Cornell	Evaluating the Role of Private Investment in Life Cycle Management of NYS Infrastructure Assets	Analyzing Willingness to Improve the Resiliency of New York City's Transportation System	PPS-AQ and PPS-CMP hosting, maintenance, backup and technical support				
CCNY	Feasibility of Lane Closures Using Probe Data	Freight Costs at the Curbside	Assessing NJ Transit's Mobile App for Users' Receptiveness	CIDNY Task 2 Develop a multi-agency/multi modal construction management tool	Task 6- Strategic ITS Deployment Plan for New York City	Transportation Infrastructure Robustness: Analysis and Measurement	
CCNY Continued	Hunts Point Terminal Market: The Feasibility of Waterborne Transportation	Induced Emissions and Energy Use in Transportation: Use of Social Media Feeds as an IM Support Tool	An Agent-Based Disaster Response Inference Model for Assessment of	An Examination of Commercial Vehicle Access to Residential Buildings in New York City	Evaluating the Impacts of Real-Time Information on Subway Ridership in New York City	Feasibility of Lane Closures Using Probe Data	
The College of Staten Island	Regional Financing Options Study						

<u>Partner</u>	<u>Projects</u>						
Manhattan College	Characterization and Modeling of Photon Absorption in Asphalt Materials	Development of a New, Effective and Low-cost Media for Sustainable Management of Polluted Road Storm-water in Highly Urbanized Areas	A Probability-Based Approach for Assessment of Roadway Safety Hardware	Monitoring Infiltration Capacity of Different Types of Permeable Pavement	Analysis of Curved Weathering Steel Box Girder Bridges in Fire	Environmental Impacts of Oil and Gas Brine	Applications for Dust and Ice Control in New York
Manhattan College	Concrete Self-Healing Method in a Harsh Environment						
NJIT	Hosting, maintenance and support for NYMTC PIMS	Feasibility of Lane Closures Using Probe Data	Smart Bus System under Connected Vehicles				

<u>Partner</u>	<u>Projects</u>					
NYIT	Traffic Prediction using Wireless Cellular Networks	Secure and Private Sensing for Driver Authentication and Transportation Safety				
NYU (includes NYU/Poly)	Development of a new connected eco-driving system at signalized intersections with adaptive signal	Measuring Parking Intrusion in New York City Neighborhoods Using Parking Tickets	CIDNY Task 2 Develop a multi-agency/multi modal construction management tool	CIDNY Task 5 - Develop a Comprehensive Guide to Signal Timing, New Detection and Advanced Signal	CIDNY Task 7 - Research on Pedestrians and Cyclists Safety Using ITS Technology in	

NYU (Continued)	CIDNY Task 8-Develop Data Storage and Access Platform for MTA BusTime Data	CIDNY Task 5- Develop a Comprehensive Guide to Signal Timing, New Detection and Advanced Signal	Public Transit and Mandatory Evacuations Prior to Extreme Weather Events in New York City			
RPI	Investigating Temporal Effects on Truck Accident Occurrence and Severity Level in NYC	Freight Costs at the Curbside	Analysis of Energy Efficient Highway Lighting Retrofits	Optimizing Work Zone Lighting	Developing A Macroscopic Decision Making Tool For Emergency Evacuation Planning	
RIT	Building a Sense of Place in an Information Era: Accessibility, Connectivity and Travel					
Rowen	Impact of Polymer Modification on Mechanical and Viscoelastic Properties of Binders	Risk analysis of autonomous vehicles in mixed traffic streams				
SUNY:						
StonyBrook	CIDNY Task 6- Strategic ITS Deployment Plan for New York City	Induced Emissions and Energy Use in Transportation: Use of Social Media Feeds as an IM Support Tool	Self-heated Pavements	Computational Synthesis of High-Performance Non-Pneumatic Tires	Nano-modified geopolymers for concrete infrastructure rehabilitation	
Buffalo	CIDNY Task 5- Develop a Comprehensive Guide to Signal Timing, New Detection and Advanced Signal	Market Potential For Battery Electric Vehicles Based On Multi-Day Activity-Travel Patterns	Heterogeneous Regional Traffic Signal Control			

Maritime	Hunts Point Terminal Market: The Feasibility of Waterborne Transportation	Spectral Based Controllability-preserving Pedestrian Evacuation Network Synthesis Using Multilayered Estimation Models in Real-time				
Albany	Innovative Travel Data Collection - Planning for the Next Two Decades	Technical Support for Use of National Performance Management Research Data Set				
Binghamton	Disaster Relief Vehicle Routing Under Uncertainty					
<u>Partner</u>	<u>Projects</u>					
New Paltz						
Syracuse University	Innovative Techniques for Maintenance, Repair and Reconstruction (MRR) of Asphalt Roadways					
University of Puerto Rico	Developing generalized linear mixed models for the strategic highway safety planning process	Using Mobile Computers to Automate the Change Order Decision Making Process and Improve Total Time and Cost Predictions on Highway Construction Projects				
The College of New Jersey	Worker Safety Issues of WIFI Devices	Improving Cross-Frame Design to Reduce the Effects of Skew in Steel I-Girder				

Projects by Partner						
<u>Partner</u>	<u>Projects</u>					
Agencies:						

NYSDOT	Analysis of Energy Efficient Highway Lighting Retrofits	Technical Support for Use of National Performance Management Research	CIDNY Task 2 Develop a multi-agency/multi modal construction management tool			
NYSERDA	Hunts Point Terminal Market: The Feasibility of Waterborne Transportation	Induced Emissions and Energy Use in Transportation: Use of Social Media Feeds as an IM Support Tool	Eco-Driving Conference			
NYCDOT	Task 6- Strategic ITS Deployment Plan for New York City	CIDNY Task 5 - Develop a Comprehensive Guide to Signal Timing, New Detection and Advanced Signal	CIDNY Task 7 - Research on Pedestrians and Cyclists Safety Using ITS Technology in NYC	CIDNY Task 8- Develop Data Storage and Access Platform for MTA BusTime Data		
NJDOT	Assessing NJ Transit's Mobile App for Users' Receptiveness	Optimizing Work Zone Lighting	Worker Safety Issues of WIFI Devices			
NYMTC	Hosting, maintenance and support for NYMTC PIMS	Innovative Travel Data Collection - Planning for the Next Two Decades	PPS-AQ and PPS-CMP hosting, maintenance, backup and technical support	Regional Financing Options Study		

4. Impact

UTRC programs impact the transportation community in several ways. Through seminars, workshops, and conferences, information is disseminated and interdisciplinary discussions are fostered; which enable transportation professionals to gain knowledge and varying perspectives on issues. This, in turn, helps practitioners to implement policies that bring about efficient and effective solutions to meet local, regional, and national transportation needs. UTRC programs also have an impact on preparing the next generation of transportation professionals through internships and classroom-based instruction. Likewise, dissemination of research findings helps to foster collaboration between academic researchers and practitioners, which assists practitioners in implementing innovative solutions that meet their specific needs.

Impacts are expected from our new research projects as work continues.

5. Changes/problems

Nothing to report

6. Special reporting requirements

Nothing to report

