

REGION II
UNIVERSITY TRANSPORTATION RESEARCH CENTER



Program Progress Performance Report by the University Transportation Research Center, Region 2
Submitted to RITA

Federal Grant # DTRT12-G-UTC02

Project Title: University Transportation Research Center – Region 2

Name of Grant: University Transportation Center

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Project/Grant Period: Start Date: January 1, 2012 End Date: December 31, 2013

Reporting Period End Date: December 30, 2012

Report Term or Frequency: six months

A handwritten signature in blue ink that reads "Penny Eickemeyer". The signature is written in a cursive style and is positioned above a horizontal line that serves as a signature line.

Signature _____

Penny Eickemeyer, Associate Director for Research, UTRC

This report will cover UTRC's three mission areas: Research, Technology Transfer, and Education for activities that occurred under the Grant# DTRT12-G-UTC02 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- During this period, the following projects have been initiated:

- **Leveraging Brightness from Transportation Lighting Systems through Light Source Color: Implications for Energy Use and Safety for Traffic and Pedestrians**
Performing Institution(s): RPI Start Date: 9/1/12 Completion Date: 8/31/13
- **Data collection and econometric analysis of the demand for nonmotorized transportation**
Performing Institution(s): UPR Start Date: 10/1/12 Completion Date: 10/31/13
- **Speed and Design Consistency of Combined Horizontal and Vertical Alignments in Two-Lane Rural Roads**
Performing Institution(s): UPR Start Date: 10/1/12 Completion Date: 9/30/13
- **Air Quality Impact of Traffic Congestion in Midtown Manhattan**
Performing Institution(s): NYU/Poly Start Date: 10/1/12 Completion Date: 09/30/13
- **Energy Savings from Transit Passes: An Evaluation of the University at Buffalo NFTA Transit Pass Program for Students, Faculty, and Staff**
Performing Institution(s): SUNY Buffalo Start Date: 10/1/12 Completion Date: 9/31/13
- **Analysis of Environmental, Economic, and Infrastructure Impacts of Transportation Activities Associated with High Volume Horizontal Fracturing Operations in the Marcellus Shale Formation Using the Geospatial Intermodal Freight Transport (GIFT) Model**
Performing Institution(s): RIT Start Date: 9/1/12 Completion Date: 11/30/13
- **Optimum Fund Allocation to Rehabilitate Transportation Infrastructure**
Performing Institution(s): NJIT Start Date: 9/1/12 Completion Date: 8/31/13
- **Determine Viscoelastic Mechanical Properties of Warm Mix Asphalt (WMA)-Reclaimed Asphalt Pavement (RAP) Mixes under High Stresses in Airfield Flexible Pavements and Its Impact on Design Life.**
Performing Institution(s): Rowan University Start Date: 10/1/12 Completion Date: 12/31/13
- **Use of Web-Based Rider Input for Transit Management in the New York City Region**
Performing Institution(s): NYU Start Date: 9/1/12 Completion Date: 8/31/13
- **Investigation of the Carrs Creek Geofoam Project**

- Performing Institution(s): Syracuse University Start Date: 10/1/12 Completion Date: 11/30/12
- **Metrics and Performance Response Functions for Assessment of Resilience of Urban Infrastructure System**
Performing Institution(s): NJIT Start Date: 10/1/12 Completion Date: 9/30/13
- **Planning level assessment of greenhouse gas emissions for alternative transportation construction projects**
Performing Institution(s): Rutgers Start Date: 9/1/12 Completion Date: 12/31/13
- **Modeling Disaster Operations from an Interdisciplinary Perspective in the New York-New Jersey Area**
Performing Institution(s): Rutgers Start Date: 11/1/12 Completion Date: 12/31/13
- **Energy Efficient and Environmental Friendly Cement Free Concrete (CFC) for Pavement and Bridge Deck Application**
Performing Institution(s): Clarkson University Start Date: 9/15/12 Completion Date: 9/30/13
- **Automating the Reporting and Progress Monitoring Process using Mobile Computers for Highway Construction Projects**
Performing Institution(s): UPR Start Date: 10/1/12 Completion Date: 9/30/13
- **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**
Performing Institution(s): RPI Start Date: 9/15/12 Completion Date: 9/14/13
- **A GIS-based Performance Measurement System for Assessing Transportation Sustainability and Community Livability**
Performing Institution(s): RPI Start Date: 10/1/12 Completion Date: 11/30/13
- **Robotic Inspection of Bridges Using Impact-Echo Technology**
Performing Institution(s): CCNY Start Date: 10/1/12 Completion Date: 9/30/13
- **Empowering Individuals to Make Environmentally Sustainable and Healthy Transportation Choices in Mega-Cities through a Smartphone App**
Performing Institution(s): Queens College, CUNY Start Date: 10/1/12 Completion Date: 11/30/13
- **Promoting Transportation Flexibility in Extreme Events through Multi-Modal Connectivity**
Performing Institution(s): NYU Start Date: 10/1/12 Completion Date: 12/31/13
- **On-Road Energy Harvesting for Traffic Monitoring**
Performing Institution(s): SUNY Stonybrook Start Date: 8/1/12 Completion Date: 1/31/14
- **Financing high speed rail in the U.S. and France: the evolution of public-private partnerships**
Performing Institution(s): John Jay, CUNY Start Date: 10/1/12 Completion Date: --
- **The Effects of Public-Private Partnerships on Traffic Safety: Evidence From Mexico**
Performing Institution(s): Cornell Start Date: 9/1/12 Completion Date: 8/31/13
- **Street Standards as Parking Policy: Identifying Residents' Willingness to Pay**
Performing Institution(s): NYU Start Date: 1/1/13 Completion Date: 12/31/13
- **Real-time Dynamic Pricing for Bicycle Sharing Programs**
Performing Institution(s): SUNY Buffalo Start Date: 9/1/12 Completion Date: 11/30/13
- **Developing self-cleaning and air purifying transportation infrastructure components to minimize environmental impact of transportation**
Performing Institution(s): SUNY Stonybrook Start Date: 9/1/12 Completion Date: 9/30/13
- **National Aviation Security to Cyber-terrorism: An Integrated Framework to Quantify the Economic Impacts of Cyber-terrorist Behavior**
Performing Institution(s): SUNY Buffalo Start Date: 10/1/12 Completion Date: 9/30/13

- ***Subsurface Imaging of Corrosion in Painted Steel Bridges***

Performing Institution(s): NYU/Poly Start Date: 10/1/12 Completion Date: 9/30/13

- ***Effectiveness Based Pavement Preservation Selection Based on Statistical Analysis of Long- Term Payment Performance Data***

Performing Institution(s): Rutgers Start Date: 1/1/13 Completion Date: 12/31/12

- ***Lessons from Hurricane Sandy for Port Resilience***

Performing Institution(s): Stevens Institute of Technology Start Date: 1/1/13 Completion Date: 10/31/13

Work has begun on several of the above-listed projects, though contractual issues and development of a new Requirements Agreement between CUNY's funding agent, RFCUNY, and the member institutions contributed to some delay. However, several projects are now underway.

Agency-initiated projects that started during this reporting period include NJDOT project:

- ***Impact Analysis of Recreational Transit Services on Local Community Economic Development, Employment and Spending***

Performing Institution: Rutgers University Start Date: October 1, 2012

Completion Date: December 31, 2013

On-going research this period includes:

- IIMS Staten Island Web and Smartphone Development, Deployment and Evaluation –SUNY Buffalo, NYU/Poly
- Road Weather Information System (RWIS) Statewide Implementation Plan -NJIT
- Adaptive Traffic Signal Control System (ACS-Lite) for Wolf Road –RPI, CCNY
- Landfill Closure with Dredged Materials Desktop Analysis Multiple Sources Development -Rutgers
- Offshore Wind Development (OSW) Research -Rutgers
- Freight-Tricycle Operations in New York City (NYSERDA funded)-CCNY
- Assistance for NYMTC with Tasks for New Major Projects-NYU
- Support for NYMTC for CMAQ Application and Documentation -CCNY

During this reporting period, UTRC initiated in-person quarterly reporting procedures to complement the written quarterly reports expected from the PIs. In addition, several of the above-listed projects have had significant accomplishments to-date. The team members in the ACS-Lite project, sponsored by NYSDOT and led by RPI for example, have collaborated to install control and communications devices along the test locations on Wolf Road in Albany, New York and some initial data on vehicle classifications has been collected. The NYSERDA-funded Freight-Tricycle Operations in NYC Project, led by CCNY, has also gotten well underway. Collaborating with the private partner Revolution Rickshaws, a pedicab and goods delivery by tricycle company, the researchers during the reporting period installed the GPS recording devices, initiated recording of measurements, developed the appropriate model and software configuration, and began data analysis.

In addition, CCNY had participated in preparing a proposal to apply to be a Volvo Research Educational Foundations Center of Excellence on Urban Freight as part of a team led by Metrans of the University of Southern California. Other team members included The Korea Transport Institute and IFFSTAR in France. During the reporting period, we learned that our team was selected, along with a separate second team led by UTRC member RPI. Research funded under this

program is expected to begin during the next reporting period. UTRC members Columbia University, Hofstra University and CCNY will be the primary UTRC collaborators in the USC Center.

Completed projects this period include:

- NYMTC Assistance with Financial Planning

b. Education and workforce development - During this period, UTRC accomplished the following:

- Began Year 8 of the NYMTC/September 11th Memorial Program Academic Initiative, three of the four graduate students selected during the last reporting period began interning at the participating agency, NYCDOT. The fourth student will begin his internship at NYMTC during the next reporting period.
- The 12 selected AITE recipients began their academic studies.
- CUNY NYC Labor Information Service and CCNY Initiated *Project on Major Work Force Challenges*.
- UPR Initiated *Improving Transportation Engineering Education by Applying the Inverted Classroom Concept*.
- Co-Sponsored ITS-NY Workshop With FHWA at NYU/Poly
 - Organized training course in professional capacity on *Integrated Corridor Management*

c. Technology Transfer – During this period, UTRC held the following events, programs, and disseminated information as follows:

- Conducted Visiting Scholar Seminar
 - Sue McNeil, University of Delaware, *Measuring Transportation Infrastructure Performance: Insights and Challenges*
- Co-sponsored Symposium (With NYU/Poly)
 - *Livable Cities of the Future: A Symposium Honoring the Legacy of George Bugliarello*
- Sponsored book talk
 - NYU professor Rae Zimmerman on *Transport, the Environment and Security-Making the Connection*
 - Organized a Presentation with a visiting scholar from China
Dr. Lam Hing Keung Williams, the Hong Kong University, *Intelligent Transport Systems (ITS) in Hong Kong: Recent Development and Future Applications*
- Participated in RITA Innovation Series
 - *The Expanding and Accelerating Universe of Ground Transportation Tech Innovation*
- Organized and participated in a series of ten public outreach sessions throughout the NYMTC region to assist the MPO with required public input for development of their Regional Transportation Plan (RTP).
- Created through the *MindMixer* community engagement website, a NYMTC website to collect public comments on their RTP, enabling stakeholders who could not attend meetings to offer comments. Over 189 ideas were submitted and 169 comments were collected through this option. This extended outreach enabled NYMTC to respond to Federal recommendations to extend the scope of their planning outreach.
- New UTRC website went live
- Designed and Developed 2012 Annual Report
- UTRC faculty participated in the 7th Annual UTC Spotlight Conference: *Sustainable Energy and Transportation Strategies, Research and Data*
- IATR Conference
 - UTRC members participated in IATR panel on research and education
- NJDOT Research Showcase

- Several UTRC presentations and poster sessions

C. Opportunities for Training and Development

As identified above, the CUNY NYC Labor Information Service and CCNY Initiated *Project on Major Work Force Challenges*, which is research to identify workforce issues that will have an impact on the urban transit workforce in the MTA service area and develop recommendations to address these issues.

In addition, 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. We also fund the AITE program to offer undergraduate and graduate scholarships to talented students to pursue either a traditional civil engineering degree leading to a graduate transportation program or an undergraduate program in a related field (e.g., planning, public administration) tailored to transportation. The graduate scholarships attract both bright students finishing up bachelor degrees and working transportation professionals who want to expand their transportation expertise.

D. Dissemination of results

At NYMTC's request, UTRC was awarded the contract for the NYMTC Assistance with Financial Planning Project to review FHWA/FTA recommendations regarding the certification process of the 2010-2035 RTP and develop a template to assist NYMTC in preparing for and reporting on future RTPs. This template was provided to NYMTC at the completion of the project. We also developed a public outreach tool using the *Mindmixer* website as part of the Financial Planning project that can be used in the future as well.

E. Plans for next reporting period: We will continue with all of our programs and research. For additional marketing, we will begin issuing press releases on each completed research study to further enhance communication about our research and findings to the professionals, stakeholders, and academics on our mailing list, approximately 3500 people.. We will also establish in-person quarterly reporting for faculty-initiated projects funded by the FY'11 grant and invite students and other faculty as appropriate to these presentations.

2. Products

Products this period have included newsletters (Summer 2012 and Spring 2012); appearance of UTRC's newly-developed website; development and launching of two public outreach websites on behalf of NYMTC (<http://nymtc-rtp.com/> and <http://ideas.nymtc-rtp.org/>), continued distribution of updated marketing materials and preparation of 2012 annual report, financial planning template for NYMTC, and *Mindmixer* tool for public outreach.

3. Participants and Collaborating Organizations						
Partner (University)	Agency Sponsor	Location (see attached)	Project(s) (# funded)	Contribution	Other Collaborators	Role
Clarkson	N/A	Potsdam, NY	Faculty-initiated (1)	research		
Cornell	N/A	Ithaca, NY	Faculty-initiated (1)	research		
CUNY:						
Queens College	N/A	Flushing, NY	Faculty-initiated (1)	research		
John Jay	N/A	New York, NY	Faculty-initiated (1)	research		
CCNY	NYSERDA	New York, NY		research	Revolution Rickshaws, NYCDOT	coordinates participants, advisor
CUNY Graduate Center NYC Labor Information Service	N/A	New York, NY	Faculty-initiated (1)			
NJIT	N/A	Newark, NJ	Faculty Initiated (2)	research		
NJIT	NYSDOT		Agency Initiated (1)	research		
NYU	N/A	New York, NY	Faculty Initiated (2)	research		
NYU/Poly	N/A	Brooklyn, NY	faculty initiated (2)	research		
RIT	N/A	Rochester, NY	Faculty-initiated (1)	research		
Rowan University		Glassboro, NJ	Faculty-initiated (1)	research		
RPI	N/A	Troy, NY	faculty initiated (3)	research	NYSDOT	
RPI	NYSDOT		Agency Initiated (1)	research	Siemens, Sensys,	technology/devices
Rutgers	N/A	New Brunswick, NJ	Faculty-initiated (1)	research		

Rutgers	NJDOT		Agency-Initiated (3)		For Landfill Closure: Birdsall and the Richard Stockton College Coastal Research Center,	
SUNY:						
Buffalo		Buffalo, NY	faculty Initiated (3)	research		
Buffalo	NYSDOT		Agency Initiated (1)	research	NYU/Poly, General Dynamics Information Technology	research, technology
Stonybrook	N/A	Stonybrook, NY	faculty Initiated (1)	research		
Maritime	N/A	Throggs Neck, NY	faculty Initiated (1)	research	Halcrow, Douglas Westwook, CWS and Kaan Ozbay (Rutgers)	
Stevens Institute of Technology	N/A	Hoboken, NJ	Faculty-initiated (1)	research		
Syracuse		Syracuse, NY	Faculty-initiated(1)	research		
University of Puerto Rico	N/A	Mayaguez PR	faculty initiated(4)	Research		
Agency Partners:						
NYSERDA				Research sponsor	CCNY	
NYMTC		New York, NY		education (Sept. 11th Memorial Program)	UTRC	
NYMTC		New York, NY		sponsor	UTRC	
NYSDOT		Albany, NY		research	UTRC	
NJDOT		Ewing, NJ		Research sponsor, tech transfer	UTRC	
NYCDOT		New York, NY		Advisor	UTRC	
Port Authority of NY and NJ		New York, NY		General sponsor collaboration	UTRC	
ITS-New York				education, tech transfer	UTRC	

Partner addresses

<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
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
Rowen	201 Mullica Hill Rd	Glassboro, NJ 08028
Rutgers	57 US HWY 1	New Brunswick, NJ 08901
SUNY Buffalo	12 Capen Hall	Buffalo, NY 14260
Stonybrook	100 Nicolls Rd	Stonybrook, NY 11794
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>			
Clarkson	Energy Efficient and Environmentally Friendly Concrete			
Cornell	The Effects of Public-Private Partnerships on Traffic Safety: Evidence From Mexico			
CCNY	Robotic Inspection of Bridges	Freight-Tricycle Operations	Assistance to NYMTC with Financial Planning	Support for NYMTC for CMAQ Application and Documentation
John Jay College	Financing high speed rail in the U.S. and France: the evolution of public-private partnerships			
Queens College	Empowering Individuals to Make Environmentally Sustainable and Healthy Transportation Choices in Mega-Cities through a Smartphone App			
CUNY Graduate Center	Major Workforce Challenges			
NJIT	Optimum Fund Allocation-Transportation Infrastructure	Metrics and Performance Response Functions for Assessment and Resilience of Urban Infrastructure Systems		
NYU	Use of Web-based Rider Input	Promoting Transportation Flexibility in Extreme Events	<i>Street Standards as Parking Policy: Identifying Residents' Willingness to Pay</i>	
NYU/POLY	Air Quality Impact of Traffic Congestion in Midtown Manhattan	Subsurface Imaging of Corrosion in Painted Steel Bridges		
RPI	Leveraging Brightness from Transportation Lighting Systems	The Role of Social Media in Improving the Safety and Efficiency of Traffic Operations	A GIS-based Performance Measurement System	
RIT	Analysis of Environmental, Economic and Infrastructure Impacts of Transportation Activities-High Volume Fracturing Operations-Marcellus Shale Formation			
Rowen	Visoelastic Mechanical Properties of WMA			

<u>Partner</u>	<u>Projects</u>					
Rutgers	Planning Level Assessment of Greenhouse Gas Emissions	Modeling Disaster Operations	Effectiveness Based Pavement Preservation Selection Based on Statistical Analysis of Long-Term Payment Performance Data	Impact Analysis of Recreational Transit Services on Local Community Economic Development, Employment and Spending	Impact Analysis of Recreational Transit Services on Local Community Economic Development, Employment and Spending	Landfill Closure With Dredged Materials
SUNY: Buffalo	Energy Savings from Transit Passes	Real-time Dynamic Pricing for Bicycle Sharing Programs	National Aviation Security to Cyber-terrorism: An Integrated Framework to Quantify the Economic Impacts of Cyber-terrorist Behavior			
Stonybrook	Developing self-cleaning and air purifying transportation infrastructure components to minimize environmental impact of transportation					
Maritime Stevens Institute of Technology	Off-Shore Wind Development					
Syracuse University	Lessons from Hurricane Sandy for Port Resilience					
University of Puerto Rico	Investigation of the Carrs Creek Geofoam Project					
	Improving Transportation Education	Data Collection and Econometric Analysis	Speed and Design Consistency	Automating the Reporting and Progress Monitoring...for Highway Construction Projects		
Agencies: NYSDOT	IIMS Staten Island Web and Smartphone Development, Deployment and Evaluation	Road Weather Information System (RWIS) Statewide Implementation Plan	ACS-Lite for Wolf Road			
NYSERDA	Freight-Tricycle Operations					
NYCDOT	Freight-Tricycle Operations					
NJDOT	Impact Analysis of Recreational Transit Services on Local Community Economic Development, Employment and Spending	Landfill Closure With Dredged Materials	Off-Shore Wind Development			
NYMTC	Tasks for New Major Projects	NYMTC Assistance with Financial Planning	Support for NYMTC for CMAQ Application and Documentation			

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