

Annual Report 2008

UTRC



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Region 2 University Transportation Research Center
Annual Report 2008
www.utrc2.org

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The photos of the Bayonne Bridge, located on the front and back cover pages of this report, are courtesy of our friends at the Port Authority of New York & New Jersey.

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This Report represents the activities of the UTRC from October 1, 2007 - October 31, 2008

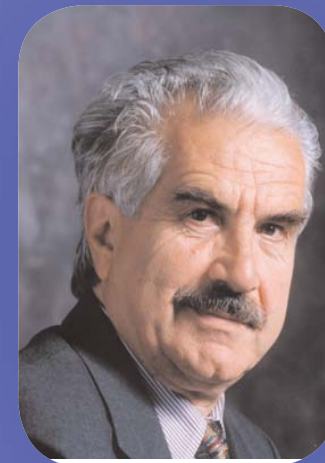
Chairman's Message

In these uncertain times of financial turmoil, the region's transportation assets need to be protected from the potential danger of financial underfunding. At the same time we need to develop new, smart strategies for maximizing the effectiveness of transportation investments to sustain and enhance the economic competitiveness of our region, as well as its social values and environmental quality. Over the years, UTRC's work program in research, education and outreach, has focused on these goals by encouraging a strong collaboration between the academic community, public agencies, and the private sector.

Together we have improved the understanding of increasingly complex transportation issues. Together we have been able to add value to the region's transportation decision-making. So I am confident that in these difficult times, UTRC will continue its contributions in transportation problem-solving through its vast pool of researchers, educators, and students from our consortium of eleven universities working together with our partners from the public and private sectors.

I am sure that when you will read this annual report you will agree with me that we are well on our way to achieving the vision.

John C. Falcocchio
Professor of Transportation Planning and Engineering
Director, Urban ITS Center
Polytechnic Institute of NYU



Dr. John
Falcocchio

Director's Message



Dr. Robert E.
Paaswell

A year of crises, 2008 ended with a major national economic dislocation, yet a sense that new leadership would find means for a meaningful recovery. Transportation - that link between all activities - has received renewed focus. First, transportation infrastructure investments are seen as job creating engines; projects that improve accessibility and reduce the costs of moving goods and people are seen as ways to revitalize industrial and commercial growth and further stimulate the economy.

The University Transportation Centers Program (USDOT) is to play a key role in the recovery. Academic research centers carry out a number of programs that can be recruited into a national transportation program. First - they are involved in training and workforce development. Next, they work on research problems confronting State and local agencies. These problems range from technical engineering analyses (e.g., optimum freight movements) to economic issues (e.g., developing valid BCA for major projects) to policy issues (site location for an intermodal terminal in a dense region). And, their great strength, they provide insight into what is just over the horizon: applications of nanotech, next generation telecommunications and operations control, exotic materials, innovative computer applications to name a few.

In Region 2, prior to the year end economic crash, transportation funding - or, better said - the shrinking funding pot - had already become a significant issue. Whether capital and operating funds for the region's bus and rail systems or funds to maintain the thousands of miles of highways and keep the bridges in good repair, traditional sources of funds - at any level - were significantly inadequate. UTRC has been involved with many of the agencies in Region 2 in searching for solutions to those problems. An analysis of a complex toll program for New Jersey, a conference on "After the Gas Tax" for New York State, and preparing white papers for transit funding commissions have been part of the UTRC routine. The ability to carry out these assignments arises from the underlying philosophy of the UTC program. Continuity of work with agencies, training students to take their place as transportation professionals, bringing cutting edge ideas to the table, and, through the UTC program, having access to a national network of the leading academic experts have all insured that UTRC can serve transportation agencies and lay groups in Region 2 with some success.

So, what will our next year bring? We are ready to be responsive to an anticipated stimulus package coming from the new administration. Job training - especially at the professional level, project management tools and evaluation tools, BCA and, of course, the research necessary for 21st C projects will be anticipated tasks. 21st C. projects must be environmentally sensitive, meet strong objectives of regional and state growth and utilize the major technological innovations of the past decade. UTRC looks forward to the contributions it can make over the next year.

2008 Highlights

RITA's Staffs Visit UTRC

Staffs from the Research and Innovative Technology Administration (RITA) spent an entire day at UTRC on September 18, 2008, meeting with UTRC staff, faculty, administrators, students, and agency partners. Staffs from RITA periodically visit University Transportation Centers around the country to learn first-hand how the centers utilize their federal grants and engage in projects that ultimately help foster goals set forth by USDOT in areas such as safety, reduced congestion, global connectivity, environmental stewardship and security, preparedness and response.



During the morning activities of the visit, UTRC staff welcomed the RITA visitors and presented an overview of the day followed by presentation and discussion on UTRC administration and financial management. The afternoon session focused on UTRC activities reflecting the many research and technology transfer projects, and educational programs performed by UTRC, and UTRC's successful collaboration with local transportation agencies and partners. The afternoon session was attended by agency partner representatives, students and faculty from consortium members, RITA, and UTRC Staffs.





Beyond the Gas Tax: A Symposium on Funding Future Transportation Needs

On Tuesday, October 7, 2008, federal and state governmental officials, academics, members of the construction industry and transportation experts from across the country gathered at the

State Fair Grounds in Syracuse, NY to discuss the status of federal and state funding for transportation infrastructure. The symposium, sponsored by the New York State Department of Transportation (NYSDOT) and UTRC, was convened in response to the reality that the gas tax, the primary source of state and federal funding for transportation investment, isn't keeping pace with growing transportation needs. The aim was to consider alternatives and supplements to the current gasoline tax as a revenue source in paying for future transportation projects. activity. He was awarded the Distinguished Public Service Medal for his efforts on behalf of the Department.





After introductions from UTRC's Director Robert Paaswell and NYSDOT Commissioner Astrid Glynn, the keynote speech was delivered by Emil Frankel, Director of Transportation Policy for the National Transportation Policy Project, Bipartisan Policy Center. Mr. Frankel began by noting that given the critical role of infrastructure in supporting the state and national economy, the declining state of transportation infrastructure cannot be taken lightly. He stressed the need for institutional reform to achieve needed transformations to transportation policy at various levels of government, including: greater yet wiser investment linked to nationally determined goals; greater reliance on user charges and less on the gas tax; greater reliance on alternative funding and financing sources, including partnerships with the private sector; and the ability to attract and support high-quality human capital in public transportation agencies.

The first of two panels of state and national experts focused on defining the problem at hand, outlining the growing capital needs of New York State's transportation network and documenting the current and future status of transportation funding and financing sources. Dr. Allison L. C. de Cerreño, Director of the Rudin Center for Transportation Policy and Management at New York University, began by noting the critical role of transportation infrastructure in the state and national economy, identifying the critical role of facilities both upstate and downstate and the size and breadth of capital projects needed to restore these facilities to a state of good repair; the New York State Department of Transportation has projected \$175.2 billion in capital needs over the next twenty years.

The picture painted by Jim Calpin, Managing Director at Merrill Lynch, was one of increasingly scarce funding and financing sources to support these projects, owed largely to the current economic downturn. Richard Drake, Program Manager of Transportation and Power Systems at NY-SERDA, further explained that inadequate investment in transportation undermines important energy and environmental policy goals as well.





The massive debt burden of the state was the focus of Mary Ann Crotty of Macro Associates, stressed the need for a broader investment policy in New York that supports borrowing for capital purposes but favors pay-as-you-go funding for maintenance needs.

Jack Basso, Director of Management and Business Development at the American Association of State Highway and Transportation Officials (AASHTO), documented the recent shortfall in the Federal Highway Trust Fund and laid out several examples of the types of tax changes needed to make up the shortfall into the future.



The second panel turned the focus on new ways to generate revenue for future transportation needs, favoring methods that not only allow for greater revenues for transportation purposes, but those that support the policy goals of energy security and reduced environmental impacts as well. Some of the alternative revenue streams discussed included: bonds (general obligation, appropriation, gas tax, and revenue bonds), dedicated state taxes, federal financing initiatives such as the National Infrastructure Bank, local-option sales taxes, private investment and user fees. Of specific note, panel member Ken Orski, the Editor of Innovation Briefs, suggested a vehicle-miles traveled fee based on trip length (and perhaps vehicle size and weight) that would more accurately reflect actual road usage “and not rely on taxing a commodity we are actually trying to discourage using.” Jonathan Peters, Associate Professor at the College of Staten Island, stressed the distinction between funding and financing, illustrating the importance of equity issues across taxpayers, business and regions through recent examples in New Jersey, Pennsylvania, and Oregon. Asha Agrawal, Director of the Mineta Transportation Institute’s National Transportation Finance Center, San José State University, discussed California’s experience and offered survey evidence of public support for “green” transportation taxes and fees. The second panel concluded with Frank Mauro, Director of the Fiscal Policy Institute, who raised the idea of revisiting the repealed state real estate capital gains tax on property sales over \$1 million and considering changes to motor vehicle and payroll taxes.

In addition to finding the right mix of alternative revenue sources, all of the panelists spoke to the need for wiser investment and institutional reform. Steve Morgan, Secretary of the New York Roadway Improvement Coalition, followed the panels with a call to action of sorts, stressing the need for strong political leadership that not only reacts to physical disasters, but successfully advocates on behalf of transportation infrastructure among competing public needs.



UTRC Best Paper Competition Winner

At its annual reception, The Council on Transportation and The University Transportation Research Center recognized the outstanding work of individuals and agencies devoted to advancing the quality and efficiency of the region's transportation system. In 2008, the Best Paper Competition award was awarded to José Holguín-Veras, Professor of Civil and Environmental Engineering, Rensselaer Polytechnic Institute, for the paper titled "An Investigation on the Effectiveness of Joint Receiver-Carrier Policies to Increase Truck Traffic in the Off-peak Hours"

Region 2's primary focus is the stewardship, management, and future evolution of its already mature transportation systems, in the face of emerging policy challenges. The region's transportation agencies must continually adjust to the nature of the economy and its evolving transportation requirements; their emerging understanding of what is required to protect public safety and security; and new challenges, such as global climate change. As advances in technology continually redraw the boundaries of what is possible, transportation agencies also face the daunting challenge of revisiting how they define their missions, serve the public and conduct their routine business. Because this region has historically faced so many transportation challenges, it has a tradition of innovation in transportation. Yet as the early solutions it adopts become institutionalized, it tends to be slow to absorb and implement lessons from innovators elsewhere in the U.S. and abroad, and thus often falls behind the curve. To become a region that can plan and manage its systems effectively in the face of change, it must become more dynamic in its approaches to the management of information and technology.

Center's Theme

UTRC's theme - "Planning and Managing Regional Transportation Systems in a Changing World" encompasses three broad thematic areas:

Planning today, in Region 2, requires knowledge of multi-modal and intermodal systems serving both freight and passenger movements. Planning in the region involves not only MPOs, but all of the many agencies taxed with the need to move people and goods 24/7. Planning is constrained by institutional mandate and history, the need to catch up with a backlog of capital needs, and a chronic shortage of adequate funds for both maintaining and building the infrastructure. UTRC's role is to provide through academic programs, a solid base on which planning decisions can be made.

Management today, in Region 2, means knowledge of interaction among complex multi modal systems, budgeting, system operations and performance targets, customer needs, the need to address security, and - when fighting fires stops - a sense of vision of system performance and regional change. Management takes place at every level: from agency board members to line operators. UTRC works to develop education and training programs to improve the state of knowledge and practice at all of these levels.

Responses to change: As the world changes, the demands on the transportation system change as well. Tomorrow's transportation systems will need to be more secure, more resilient to natural hazards, less damaging to the environment, and better able to use available capacity efficiently. Emerging transportation systems rely on real time technology and rapid transfer of operational information. The institutions that have traditionally operated the regional assets must, themselves, begin to change. They must think multimodally, with integrated operating systems. UTRC strives to assist these agencies to achieve organizational change responsive to new missions.

Staff



Dr. Robert E. Paaswell

Director, UTRC
Distinguished professor of
Civil Engineering
The City College of New York



Dr. Camille Kamga

Associate Director of
Administration and
Information Technology



Penny Eickemeyer

Assistant Director for
Program Management



Harold Stolper

Assistant Director for
Research & Outreach



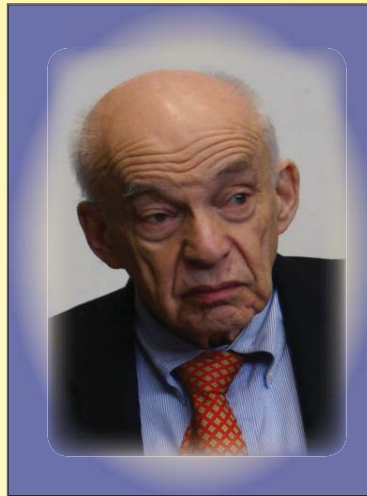
Dr. Claire McKnight

Assistant Director
of education and Training
Associate Professor
of Civil Engineering,
The City College of New York



Dr. Ellen Thorson

Senior Research Fellow



Herbert Levinson

UTRC Icon Mentor
Transpiration Consultant
and Professor Emeritus of
Transportation



Andrew Nagel

Intern - Information
Technology



Nadia Aslam

Administrative Assistant



Alex Monastiriotis

Intern - Information
Technology



Elissa Gelnick

Design Intern

UTRC has adopted a corporate style of management. In this style, the UTRC Board provides policy guidelines, and approval of UTRC activities. Dr. Robert Paaswell, Distinguished Professor of Civil Engineering at City College of New York, serves as Chief Executive Officer, overseeing day-to-day operations and providing a bridge between UTRC policies and the activities and resources used to carry out those policies.

The Board of Directors, chaired by Dr. John Falcocchio of Polytechnic University conducts its business through a well-organized committee structure. The Board (Committee of the whole) reviews Center Objectives and Programs, approves budgets, and reviews and recommends actions forwarded by its two major working committees.

The two committees, Research and Technology Transfer, chaired by Dr. Ali Maher of Rutgers University, and Education and Training, chaired by Dr. Neville Parker of City College are the working hearts of the Board. Each is responsible for developing the yearly program of activities, overseeing the selection of projects, and recommending to the full Board the programs of projects commensurate with the budget.

Management Structure

Claire McKnight, Ph.D.
City University of New York, New York

Neville A. Parker, Ph.D.
City University of New York, New York

Soulaymane Kachani, Ph.D.
Columbia University, Earth Center, New York

Elliott Sclar, Ph.D.
Columbia University, Earth Center, New York

Huaizhu (Oliver) Gao, Ph.D.
Cornell University, New York

Arnim H. Meyburg*, Ph.D.
Cornell University, New York

Pricilla P. Nelson, Ph.D.
New Jersey Institute of Technology,
New Jersey

Lazar Spasovic, Ph.D.
New Jersey Institute of Technology,
New Jersey

Allison L. C. de Cerreño, Ph.D.
New York University, New York

Rae Zimmerman, Ph.D.
New York University, New York

John C. Falcocchio, Ph.D.
Polytechnic Institute of NYU, New York

Richard Wener, Ph.D.
Polytechnic Institute of NYU, New York

José Holguin-Veras, Ph.D.
Rensselaer Polytechnic Institute, New York

William "Al" Wallace, Ph.D.
Rensselaer Polytechnic Institute, New York

Daniel G. Chatman, Ph.D.
Rutgers University, New Jersey

Ali Maher, Ph.D.
Rutgers University, New Jersey

Catherine T. Lawson, Ph.D.
State University of New York, Stony Brook,
New York

Shmuel Yahalom, Ph.D.
State University of New York, Stony Brook, New York

Hank Dobbelaar, Ph.D.
Stevens Institute of Technology, New Jersey

Sophia Hassiotis, Ph.D.
Stevens Institute of Technology, New Jersey

Ismael Pagán-Trinidad, Ph.D.
University of Puerto Rico - Mayagüez, Puerto Rico

Didier M. Valdés-Díaz, Ph.D.
University of Puerto Rico - Mayagüez, Puerto Rico

Board of Directors

* Retired in 2008

City University of New York
 The City University of New York is the nation's largest urban university. CUNY, with more than 100 nationally recognized research centers, institutes and consortia, is also one of the nation's major research institutions. Due to its urban context, many of CUNY's campuses are involved in transportation research and education. CCNY is UTRC's host campus. Faculties within several departments are actively involved in transportation research and the activities of UTRC. CCNY is also home to the CUNY Institute for Transportation Systems and the CUNY Institute for Urban Systems.



University of Puerto Rico
 The University of Puerto Rico was established in 1903. Transportation research at UPR is concentrated on its Mayagüez campus, which serves over 12,000 students. Its Department of Civil Engineering has an active program in natural hazards research with applications in transportation. UPR is home to the Civil Infrastructure Research Center, which was funded by FEMA, FHWA, the Puerto Rico Department of Transportation, and other partners, and the Puerto Rico Transportation Technology Transfer Center, the local center for FHWA's Local Technical Assistance Program.



New York University
 Founded in 1831, New York University is one of the largest private universities in the United States, with nearly 51,000 students. NYU is home to the Robert F. Wagner Graduate School of Public Service, which engages

transportation issues through programs in Urban Planning, Public Management and Finance, and Negotiation and Conflict Resolution. NYU also is host to the Rudin Center for Transportation Policy and Management and the Institute for Civil Infrastructure Systems.

Member

Columbia University
 Columbia University was founded in 1754 and is the oldest institution of higher learning in the state of New York, with enrollments of over 23,000 students in 16 schools and colleges. Columbia conducts transportation-related research through its strong departments of Urban Planning, Civil Engineering, and Industrial Engineering and Operations Research. Columbia is also home to the Earth Institute, which houses The Center for Sustainable Urban Development.



Cornell University
 Founded in 1868 and being first university in the eastern United States to admit women, Cornell University today encompasses thirteen undergraduate, graduate, and professional colleges and schools. Cornell is a unique combination of public and private divisions, being both a private, nonsectarian university and the land-grant institution of New York State. Cornell is home to the Transportation Infrastructure Research Center and the Cornell Local Roads Program, New York State's Local Technical Assistance Program center.



New Jersey Institute of Technology
 NJIT is a public research university enrolling nearly 8,100 students in 92 degree programs. NJIT has built its research program around multi-disciplinary centers that encourage partnerships among various disciplines, educational institutions, private enterprise and government agencies. NJIT is home to the National Center for Transportation and Industrial Productivity, the International Intermodal Transportation Center, and the New Jersey TIDE (Transportation Information and Decision Engineering) Center.





State University of New York

The State University of New York's 64 geographically dispersed campuses comprise the nation's more comprehensive system of public higher education. Across this network, SUNY has many capabilities that relate directly and indirectly to transportation research: urban planning and nanotech at Albany; civil and earthquake engineering, urban planning, and transportation injury research at Buffalo; environmental mitigation and biofuels at Syracuse; port security and trade at Maritime College; thermal sprays at Stony Brook; and pavements at Farmingdale. Many individual faculty members at other SUNY campuses are involved in transportation research as well.



Rensselaer Polytechnic Institute

RPI was established in 1824 and has the oldest program in Civil Engineering in the English-speaking world. RPI provides vast leadership in research relating to intelligent transportation systems, transportation modeling, traffic operations, intermodal freight transportation, transportation economics, and analytical approaches to emergency management. RPI hosts the Center for Infrastructure and Transportation Studies, The Intermodal Center for Freight Security and the Lighting Research Center, which has a dedicated Transportation Lighting Group.

Polytechnic Institute of NYU

Polytechnic Institute of NYU, the nation's second oldest private engineering university, was founded in 1854 in Brooklyn, New York. Today, it is the New York metropolitan area's preeminent resource in science and technology education and research. In the transportation field, Polytechnic has strengths in Traffic Models, Highway Capacity and Traffic Operations, and Intelligent Transportation Systems. It is home to the Urban ITS Center, funded by the New York City Department of Transportation.



Universities

Rowan University

Established in 1923, Rowan is a comprehensive public university serving nearly 10,000 students in a Graduate School and several Colleges. Rowan's Civil and Environmental Engineering Department conducts transportation research in the



areas of pavement design, materials, rail crossing safety, structural design of bridges, and structural design and testing of transit vehicles. Other areas of transportation research include renewable energy technologies, diesel combustion, distributed instrumentation systems and smart sensors, and vehicle systems integration.



Stevens Institute of Technology

Founded in 1870 in Hoboken, New Jersey, the Stevens Institute of Technology is one of the leading technological universities in the country. Research at Stevens Institute includes structural dynamics, soil-structure interaction, freight transportation, and embedded, real-time, intelligent infrastructure systems.

Rutgers University

Rutgers University is one of America's leading public research universities and educates over 48,000 students on its three campuses. Rutgers' Department of Civil and Environmental Engineering, Department of Industrial and Systems Engineering and Edward J. Bloustein School of Planning and Public Policy are all active in transportation research. It is home to the Center for Advanced Infrastructure and Transportation, which serves as New Jersey's center for FHWA's Local Technical Assistance Program, the Voorhees Transportation Center and the National Transit Institute.



Financial Report

The following charts summarize the UTRC revenues and expenditures for FY 2007-2008. Under the transportation bill - SAFETEA-LU, the University Transportation Research Center Region 2 funding allocated to programs totaled more than \$6 Millions in 2007-2008. This fiscal year, the annual USDOT grant allocated to our programs was \$1,653,574. The USDOT funds represent 27 percent of the total allocation.

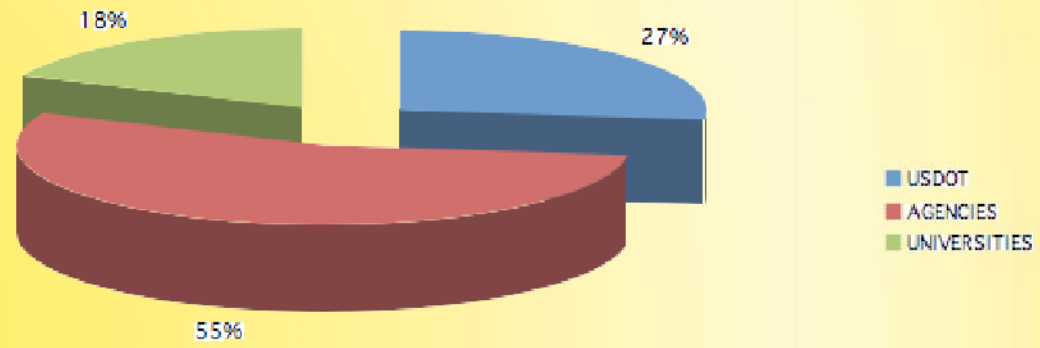
During the FY 2007-2008, UTRC has continued to strengthen its relation with its partners. As in the past, UTRC's longtime partners, the New York State Department of Transportation, the New York Metropolitan Transportation Council, the New Jersey Department of Transportation, and the New York City Department of Transportation, provided a combined 55 percent of the revenues in fiscal year 2007-2008. UTRC's in-kind support from university members and agencies were 18 percent of the total budget.

Continued with its tradition, and strong partnerships, and solid financial commitment from federal, state, and local transportation agencies, UTRC allocated 66 percent of its total budget to research projects. To carry out administrative and technology transfer programs, 21 percent of funds were used. The remaining funds (13%) were allocated to the Advanced Institute for Transportation Education program, the September 11th Memorial Program for RTP - Academic Initiative, and other educational initiatives.

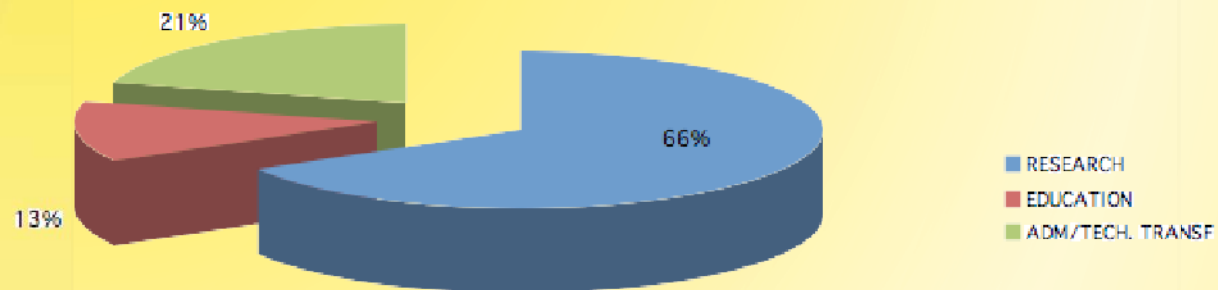


FY 2007-2008

FY 2007-2008 Revenues



FY 2007-2008 Funds Allocation



Education & Training



The modern professional must combine the technical skills of engineering and planning with knowledge of economics, environmental science, management, finance, and law as well as negotiation skills, psychology and sociology. And, she/he must be computer literate, wired to the web, and knowledgeable about advances in information technology. UTRC's education and training efforts provide a multidisciplinary program of course work and experiential learning to train students and provide advanced training or retraining of practitioners to plan and manage regional transportation systems. UTRC must meet the need to educate the undergraduate and graduate student with a foundation of transportation fundamentals that allows for solving complex problems in a world much more dynamic than even a decade ago. Simultaneously, the demand for continuing education is growing - either because of professional license requirements or because the workplace demands it - and provides the opportunity to combine State of Practice education with tailored ways of delivering content.

Benjamin Reim of Rensselaer Polytechnic Institute is the recipient of the 2007 Student of the Year from UTRC. He graduated with a B.S. in Civil Engineering in 2005 and continued immediately into a M.S program in transportation engineering.

When Ben started the M.S. program, Prof. Holguin-Veras' work with discrete choice modeling interested him the most, and as a result he became involved with modeling passenger car behavior to time of day pricing. Since graduating, he has been working for Kimley-Horn and Associates as a transportation analyst.

Ben Reim was chosen as UTRC's Student of the Year because of his commitment to excellence and professionalism during his stay at Rensselaer Polytechnic Institute and the high quality of his transportation research.



Haiyun Lin is the 2008 recipient of the UTRC's WTS Student Award of \$1000, which goes to the winner of the Women's Transportation Seminar's (WTS) Leonard Braun Memorial Graduate Scholarships. She is currently a student at the Department of Civil Engineering at City University of New York, where she has enrolled in the Ph.D. program in Transportation Engineering with a concentration in transportation planning.

Besides her studies, Haiyun is currently a research assistant at Region II University Transportation Research Center. At the Center, her work mainly includes technology testing for MPO's regional travel survey, as well as design and implementation of the New York

Metropolitan Region residential relocation survey.

Haiyun Lin is interested in exploring both individual and regional travel demand and supply from behavior point of view, grounded in residential location search behavior and selection process. She is also interested in demand analysis for public transportation system, with a hope of working on transit oriented development in the future.



Academic Initiative
2008/2009 Awards

UTRC received applications from fifteen students from several consortium schools. The students were evaluated by a committee of seven comprised of faculty and agency representatives who rated the students on relevance of academic and professional preparation, quality of their submitted essay, and strength of recommendation letters. In addition to these criteria, the candidates for independent research were evaluated on the relevance and feasibility of their proposal. The following five students were selected:

Peter Feroe, a Masters student in Urban Planning at New York University, is participating in an internship with the Westchester County Department of Planning on "Transit Oriented Development along the I-287 Corridor in Westchester County." His work is supervised by Ed Buroughs, Deputy Commissioner of Westchester County Department of Planning.



Nicholas Tulach, a Ph.D. student in city and regional planning at Rutgers University will be undertaking an independent research project on "Jurisdictional Boundaries for Comprehensive Street Planning in New York City." His faculty advisor is Professor Daniel Chatman and his professional advisor will be Michael Flynn of the New York City Department of Transportation.



Darrell Sonntag, a Ph.D. student in Civil Engineering at Cornell University will be conducting an independent research project on "Modeling the Temporal and Size Distributions of Diesel Vehicular Particulate Matter Emissions." His academic advisor is Professor Oliver Gao and his professional advisor is Larry McAuliffe of NYMTC.



Jennifer Lozano, a master's student in Urban Planning at New York University, is an intern with Metropolitan Transportation Authority Capital Construction. As part of her internship, Ms. Lozano will evaluate the outcome of workforce development initiatives and measure their success.

Evan Bialostozky, a master's student in Geography at Hunter College, is participating in the program at NYMTC in the technical group. Evan's work will include the development of an algorithm to detect transportation modes from GPS travel survey data, and assessment of the survey design of both the upcoming and the 1997/98 Regional Travel Household Survey.

September 11th Memorial Program

Nancy Mahadeo is a master's student in City and Regional planning at Rutgers University. She has done an internship with the New York Metropolitan Transportation Council on "Mobile Source Emissions Reduction Planning," under the guidance of Larry McAuliffe of NYMTC.



Timon Stasko, a doctoral student in Civil Engineering at Cornell University. He conducted an independent research project on, "Optimal Incentive Structures for Encouraging Diesel Retrofits." His advisors were Prof. Oliver Gao of Cornell and Mark Simon of NYCDOT.



Matthew Roe, a master's student in Urban Planning at Columbia University. He has done an internship with the New York City Department of Transportation on "Pedestrian and Traffic Safety Planning," under the guidance of Seth Berman and Ann Marie Dougherty.



Brian Ross, a master's student in Urban Planning at New York University. He has done an internship with the New York Metropolitan Transportation Council on "Coordinated Human Services - Public Transit Planning," under the guidance of Nancy O'Connell.



Gitakrishnan Ramadurai, doctoral student in Civil Engineering at the Rensselaer Polytechnic Institute. He conducted an independent research project on "Identification and Modeling of Next Generation Traveler Guidance Systems." His advisors are Prof. Satish Ukkusuri of RPI, and Todd Westhuis of NYSDOT.

Academic Initiative 2007/2008 Update

The University Transportation Research Center has continued to work with the New York Metropolitan Transportation Council to administer NYMTC's September 11th Memorial Program for Regional Transportation Planning - Academic Initiative. This program was established to honor three colleagues lost in the attack on the World Trade Center, Ignatius Adanga, Charles Lesperance, and See Wong Shum. This program was designed to educate and motivate people interested in transportation technology and planning and to encourage innovations in planning activities throughout the region. The program's Academic Initiative provides tuition and stipend support to talented students from across the region for internships and independent research projects.

2007-08 Student Presentations

The five students who participated in the program during the 2007-08 academic year made final presentations of their work at a brown bag lunch seminar at NYMTC (199 Water Street, 22nd Floor, in New York City) at Noon on Sept. 17, 2008.

Technology Transfer

High-Speed Rail in the United States: Can the Dream Be Realized?

At the NJDOT Technology Transfer Seminar organized by the University Transportation Research Center, Dr. Allison L. C. de Cerreño, Director of Wagner Rudin Center for Transportation Policy and Management at New York University, gave a presentation on “High-Speed Rail in the United States” Can the Dream Be Realized”?

Many European and Asian countries have implemented or plan to implement high-speed rail (HSR) and/or Maglev. Though U.S. efforts have spanned 40 years, nothing comparable has been implemented in the United States to date. This presentation was based on the findings of two studies funded by the Mineta Transportation Institute at San José State University that used a combination of literature review and interviews to derive lessons from the U.S. experience. Touching on the Chicago Hub, the Florida, Keystone, and Northeast Corridors, this presentation suggested that several factors are critical to success of HSR projects, while lack of them has led to repeated failures. Based on the research, Dr. de Cerreño questioned whether the two limited U.S. successes can be replicated without ownership of the right of way by a single passenger rail entity and whether incremental HSR efforts are more likely to succeed in the current political climate.



Performance Measures for Traffic Management Policies in City Centers - A Manhattan Case Study

During the Brown Bag Seminar organized by UTRC and hosted by the New York Metropolitan Transportation Council (NYMTC), Dr. John C. Falcocchio discussed the Performance Measures for Traffic Management Policies in City Centers. Dr. John C. Falcocchio is Professor of Transportation Planning and Engineering at Polytechnic Institute of NYU; Director of the Urban ITS Center; and Chairman of the Board of Directors of the University Transportation Research Center.

In this presentation, Dr. Falcocchio discussed the principles of street traffic management, quantifying traffic congestion, measuring the impact of traffic congestion on traveler mobility (using examples from Lower Manhattan and Manhattan's West Side), causes of traffic congestion in the Manhattan Hub, and the role of demand and supply strategies in reducing Manhattan's traffic congestion.



Closing the Gap: Financing the Region's Transportation Needs

The NYU Wagner Rudin Center for Transportation Planning and Management organized and hosted a seminar titled, "Closing the Gap: Financing the Region's Transportation Needs". Edward Rendell, Governor of the Commonwealth of Pennsylvania, provided the keynote address. In addition, the conference featured two panels of experts who reviewed the past and present context for the current transportation funding crisis, defined the challenges facing this region in terms of needs versus resources, and discussed future options for "closing the gap."

Transportation needs continue to outpace our ability to find long-term and sustainable funding sources. State-of-good-repair, normal replacement, capital expansion and operations are all at risk. As the crisis grows, states and municipalities have begun exploring new financing mechanisms, including public-private partnerships, increased tolls, congestion pricing, and user fees. At the federal level, recent reports explore various alternative sources of funding as well. However, there are no easy choices, and in many cases the political will to make these difficult decisions is lacking. During the presentation, an overview of issue was explored concerning how we arrived at this crisis, what it means for the New York metropolitan region, and how we might address these critical challenges as we seek to maintain, improve and expand our regional transportation system.

This presentation was co-sponsored by New York Metropolitan Transportation Council, Metropolitan Transportation Authority, Port Authority of New York and New Jersey, University Transportation Research Center, and CSX.

Urban Freight: Developing a Freight Efficient Strategy in a Built Environment

UTRC organized this seminar under the NJDOT Technology Transfer program. Dr. Ann G. Morris, Director of The Center for Logistics and Transportation at Baruch College talked on the topic of Urban Freight.

The goal of the Urban Goods Movement Study (UGMS) was to identify obstacles to efficient goods movement that contributed to the increasingly high cost of bringing product into New York City's Central Business District (CBD). An evaluation of opportunities for change in the operational and institutional aspects of goods movement with the potential for near-term and continuing benefits was carried out.



Data collection in Stage 1 of the UGMS consisted of 13 industry sector focus groups attended by senior executives of companies moving freight into Manhattan's CBD. In Stage 2, 74 Freight Mobility Surveys completed by logistics and transportation managers identified barriers to freight efficiency in the last link of the supply chain. In Stage 3, The First and Last Mile Study, focused upon the pick-up/drop-off point for freight at commercial properties.

Characteristics of COBs, and their freight receiving facilities were documented in an interview/survey administered to 82 property managers. Time and motion studies of dwell times were also carried out at six COB loading docks, and logs of daily dock deliveries to COBs were also collected and analyzed. The findings for these stages were remarkably consistent. They revealed that a recurrent and invisible bottleneck, a lack of sufficient off-loading facilities in commercial office buildings (COBs), impeded efficient freight transportation in commercial centers along with the usual suspects, street congestion, parades, construction, etc.



THINKING BIGGER: New York and Transportation in the Northeast Megaregion

On November 13, over 300 individuals from both the public and private sector attended "Thinking Bigger: New York and Transportation in the Northeast Megaregion." The event was hosted by the NYU Wagner Rudin Center for Transportation Policy & Management and the New York Metropolitan Transportation Council. The event was co-sponsored by the Metropolitan Transportation Authority, the University Transportation Research Center - Region 2, the Port Authority of New York and New Jersey, along with the American Institute of Architects New York Chapter, the Regional Plan Association, the University of Delaware's Institute of Public Administration and the Wagner Transportation Association.

This event addressed the key transportation issues affecting the Northeast Megaregion. Recognizing that what happens to the Northeast Corridor beyond the boundaries of New York is critically important to the New York metropolitan region, the goals of this symposium are two-fold: (1) To foster a better understanding of the relationship between the Northeast Corridor and the broader megaregion and the importance of thinking beyond our own borders; and, (2) To begin the discussion of how to address transportation challenges beyond the region that affect New York.

The keynote speaker was Kris Kolluri, Commissioner, New Jersey Department of Transportation and Chairman of NJ Transit. Panel sessions comprised of key decision makers and leaders had enabled and encouraged dialogue between presenters and the audience.



Blast and Seismic Effects on Highway Bridges

During the NJDOT Technology Transfer Seminar Presentation organized by UTRC, Dr. Anil Agrawal, Associate Professor of Civil Engineering at The City College of New York, discussed his research project on Blast and Seismic Effects on Highway Bridges.

This research presented seismic fragility curves and innovative fragility surfaces through dynamic analysis and improved probability methods to identify the damage probability and explore retrofit strategies for highway bridges in Northeastern U.S. Although earthquakes in this region are infrequent, they are believed to pose a significant hazard because of the risk of extensive damage to the existing aging bridge network, especially when considering its key role in the transportation network of the United States. Towards this objective, seismic fragility curves and fragility surfaces are constructed for individual components and the complete bridge system, as a function of Peak Ground Acceleration (PGA). The effectiveness of several retrofit measures, such as elastomeric bearing, lead rubber bearing, viscous damper and carbon fiber Jacket, are verified through the modified fragility curves.

There is increased awareness towards security of highway bridges from intentional or unintentional blast events. Hence, a bridge may need to be designed to sustain both seismic and blast events during its lifetime. In this research, a high-precision model of a Highway Bridge had been developed to study blast effects and correlations between seismic detailing and blast resistance.



Transportation Security Discussed at Protect New York's First State Conference

Transportation security was a primary subject of discussion in the first state academic conference on research related to New York's Security. The conference was at the State University of New York's Levin Institute in January 2008 by Protect New York (www.protectnewyork.org), an academic and professional society composed of nearly 200 academic faculty members and devoted to research and education on ways of safeguarding the state from disaster and terrorism.

The University Transportation Research Center sponsored the transportation security panel, chaired by Prof. Daniel Hess of the Department of Urban and Regional Planning at SUNY's University at Buffalo. Of the five papers presented on the panel, four were on subway security. For example, Harvey Molotch and Noah McClain presented preliminary findings from a study on factors affecting workers' vigilance against threats in the subway system. Jennifer Richmond-Bryant and Ann Wittig of City College presented on dispersal of threat agents in a subway station. On a non-subway topic, James Ercolano of NYSDOT presented data on pedestrian evacuation during disaster, as occurred in Manhattan during 9/11.

The Window of Opportunity is Now: How Wireless Can Move Us to More Sustainable Transportation

The University Transportation Research Center hosted a seminar titled “Window of Opportunity is Now: How Wireless Can Move Us to More Sustainable Transportation” featuring Robin Chase. Robin Chase is founder and CEO of GoLoco, an online ridesharing community. She is also founder and former CEO of Zipcar, the largest carsharing company in the world.



The launching point for her talk was the global climate crisis, which is now acknowledged at the highest levels by most national governments around the world, but which has not yet significantly started to influence transportation policy. According to the Intergovernmental Panel on Climate Change (IPCC), even if worldwide CO2 emissions begin a downward trend in 2015 - which would be a difficult achievement - there will be only a 50% chance of avoiding catastrophic effects of climate change. Many tools in the transportation kit, such as building new transit systems, reorganizing land use, and changing over vehicle fleets to use alternative energy systems, cannot produce significant CO2 reductions on this timeframe. Strategies that directly influence transportation behavior, such as market and cost-based pricing, can affect emissions rates much more quickly. But changes in behavior, cost structures, and lifestyle are a hard sell with the public. How can we sweeten this deal for transportation users?

Ms. Chase’s answer lies in freeing the private sector to develop and market innovative new transportation services, such as car-sharing, ridesharing, and information services far superior to what is available today. Two key elements are needed to free the market to achieve this: first, the pricing environment for travel by private vehicles needs to be radically different from what it is today. While the prospect of this seems remote at the moment, if emissions caps are established, then governments may begin shifting the basis for taxation away from labor and income and toward pollution and energy use. If this happens, then the cost structure of transport systems will change significantly.

The other key lies in the availability of wireless technologies that serve as the backbone for information services that support innovative transportation systems. Wireless technologies can transform our experience and costs associated with car travel (car sharing and ride sharing), and can provide a new economic platform for innovation and economic development (mesh networking). One key to making this innovation economically feasible in the near term is to ensure that the investments we are making today in wireless communications infrastructure - including systems for congestion pricing and traffic management - provide an open network and open-access platform.

This presentation was co-sponsored by NYU Wagner Rudin Center for Transportation Policy and Management, CUNY Institute for Urban Systems, Port Authority of New York and New Jersey, and the New Jersey Department of Transportation.



Electricity, Biofuels or Hydrogen for Vehicles: What Should States Do?

Clinton Andrews, Associate Professor and Director, Program in Urban Planning and Policy Development, Bloustein School of Planning and Public Policy, Rutgers University, at the NYMTC Brown Bag Seminar organized by UTRC, gave a presentation on the topic; "Electricity, Biofuels or Hydrogen for Vehicles" .

Concerns over the price, availability, security, and environmental impacts of petroleum are spurring interest in alternative fuels for vehicles. The leading contenders are electricity, probably achieved via the intermediary of plug-in hybrid electric vehicles; biofuels, achieved with ethanol blends or, better yet, with biodiesel; and hydrogen, achieved with advances in fuel-cell technology and a new fueling infrastructure. Proactive governments want to encourage the transition away from fossil fuels without arbitrarily picking winners among the alternatives or wasting resources on infrastructure elements that never get used. What should state governments do? This talk provided an update on the status of the technological alternatives, discuss current governmental actions, and offer a framework for answering the policy question.

Dr. Clinton Andrews approaches policy questions from the bottom-up perspectives of engineering and planning. His recent academic work focuses on problems involving multi-party decision making and regulatory policy. This includes the modeling and analysis of regional electric power systems, environmental federalism, and industrial ecology. He nurtures a cross-cutting interest in "communicative" analysis designed to inform shared decisions. His non-academic background includes engineering project management in the private sector and technology assessments for government. He is a licensed professional engineer, and was awarded the IEEE Third Millennium Medal in 2000. Previously, he was on the Princeton faculty, where he helped launch a program in Science, Technology, and Public Policy. He is a past president of the IEEE Society on Social Implications of Technology. He is currently director of the program in Urban Planning and Policy Development at Rutgers.

Cities, Energy, and the Post-Oil Paradigm

The Journal of Urban Technology (JUT) and two CUNY Institutes, the Institute for Urban Systems and the Institute for Sustainable Cities, and the University Transportation Research Center, have co-sponsored a presentation by the Canadian scholar, Anthony Perl, the guest editor of JUT's issue on "Cities, Energy, and the Post-Oil Paradigm."

Anthony Perl is professor of urban studies and political science at Simon Fraser University where he directs the Urban Studies Program. He presented an overview of JUT's special issue and its origin in a workshop held at the conclusion of the 2006 World Urban Forum. He addressed why the issue's contributors focused on cities as the place where debates over alternative energy and climate paradigms are most likely to yield innovative solutions that herald new paradigms for urban design and mobility. He offered a sneak preview of what such arrangements might look like that is drawn from the soon-to-be-published *Transport Revolutions: Moving People and Freight Without Oil*, co-authored with Richard Gilbert.

The presentation was followed by a panel discussion with Richard Gilbert, Toronto-based planner, Peter Marcotullio, Hunter College, and Michael Bobker of the CUNY Building Performance Lab.

Cities will soon be using less oil, as a result of the "peaking" of oil production and of the efforts to reduce the production of greenhouse gases. The main issues being discussed in the presentation were; How will cities adapt? What steps can be taken? What steps are already being taken? Where? What are the best practices? What are the social, political, and economic challenges to change?



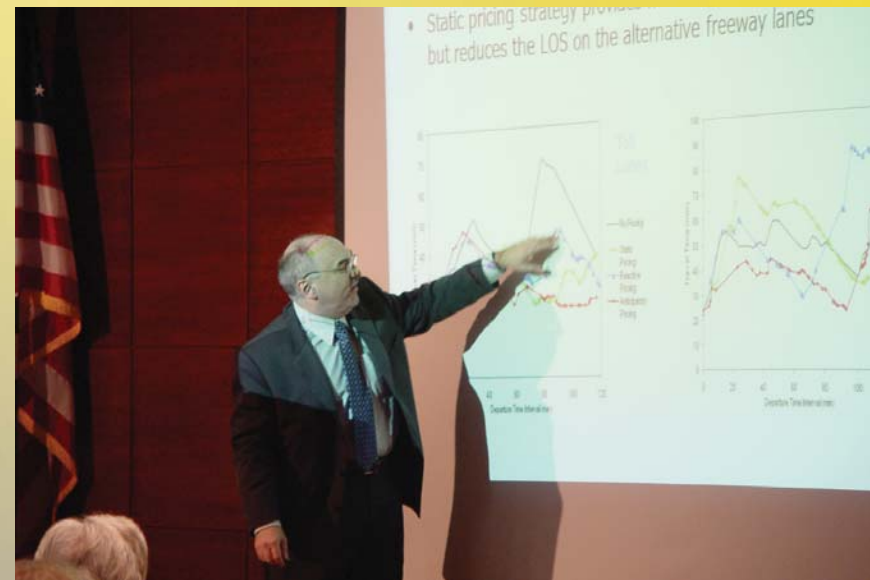
Richard Gilbert discussed the Hamilton Report (see www.richardgilbert.ca), an attempt at Energy-First Planning in Hamilton, Ontario. This outline of a plan for urban life after peak oil was commissioned by the City Council following citizen complaints that the ongoing planning process made unrealistic assumptions about future energy availability. The Report caused a stir when issued in April 2006, was shelved and mostly forgotten, but may yet have an impact, perhaps beyond Hamilton's boundary, as the implications of \$100/barrel oil become clear.

Predictive Strategies for Real-Time Pricing, Information and Traffic/Access Control

The University Transportation Research Center hosted a seminar featuring Hani S. Mahmassani, William A. Patterson Distinguished Chair in Transportation at Northwestern University.

Dr. Hani discussed the role of pricing as a real-time management tool, in conjunction with information supply, along with strategies for anticipatory pricing in conjunction with online network state prediction tools. The objectives for developing and applying these tools are to reduce congestion and improve environmental quality. These developments will allow our existing infrastructure to deliver significantly higher throughput than under previously designed operations. The presentation proposed effective algorithms based on predictions derived from sensors and data from current conditions. Instead of relying on real-time conditions to set pricing and management decisions, these strategies allow system managers to peer 20 minutes or so in the future, and make decisions on the basis of those anticipated conditions instead. By doing this, far more reliable and effective management strategies can be devised, because the chances that the system will enter into a “breakdown” state where traffic volumes fall precipitously can be significantly reduced.

This presentation was co-sponsored by NYU Wagner Rudin Center for Transportation Policy and Management, CUNY Institute for Urban Systems, Port Authority of New York and New Jersey, New Jersey Department of Transportation.





Workshop on Land-Use Modeling at Metropolitan Planning Organizations



NYMTC and UTRC held a workshop on Land-Use Models in Transportation Planning on May 1, 2008 at NYMTC headquarters. The workshop was attended by about 60 people, including staff from NYMTC and its member agencies, and university faculty from around the region. In addition, staff from several MPOs from around the country participated by speakerphone. The purpose of the workshop was to inform NYMTC member agencies about what land-use models can do, and how they are being used by peer agencies across the country.

The keynote speaker, Dr. Eric Miller, Professor of Civil Engineering from the University of Toronto, provided an overview of land-use modeling on issues such as urban form - transportation interactions, need for integrated urban models, key design elements and issues, and the current state of modeling.

After the keynote, a panel of representatives from four MPOs followed, offering their agency's perspectives on the use of land-use models. These speakers included Sonny Conder of Portland Metro discussing MetroScope; Jamie Bridges of Baltimore Metropolitan Council discussing the development experience with PECAS; Dmitry Messen of Houston-Galveston Area Council discussing UrbanSim; and Mike McCoy of the University California Davis, discussing the CALTRANS model development from a number of California MPOs. The panelists described their individual models, strengths, weaknesses, history of development and applications for use. Though each model may differ in its characteristics, the advantage of integrated models is that they allow for testing of a wide variety of policy, planning and investment alternatives.

Ali Mohseni, NYMTC Manager of Modeling, presented some background information on an earlier project to develop a land use model for the New York metro region. After lunch, the participants organized into groups, representing their level of agreement with the idea of developing a land-use model for the New York City region, and were asked to identify questions and issues that would need to be addressed prior to making a final decision about implementing a model. NYMTC staff plans to compile this information, obtain answers and disseminate to the NYMTC members, who will then discuss further action to be taken by NYMTC regarding model development.

A Practical Policy Sensitive Activity-Based Model

During the Brown Bag Seminar organized by UTRC and hosted by the New York Metropolitan Transportation Council (NYMTC) on March 25, 2008, Yoram Shiftman, Professor of Civil and Environmental Engineering at The Technion in Israel, gave a presentation on the topic: "A Practical Policy Sensitive Activity-Based Model".

Activity-based modeling treats travel as being derived from the demand for personal activities. Travel decisions, therefore, become part of a broader activity scheduling process based on modeling the demand for activities rather than merely trips. The explicit modeling of activities and the consequent tours and trips enables a better understanding of travel behavior and more credible analysis of response to policies and their effect on traffic and air quality.

Few applications of this approach have been developed in the last years but in an effort to enhance behavioral realism have reached a significant level of complexity that put their practical use, which is their main objective, at risk.

This talk described how to construct a practical policy sensitive activity-based model using the example of the model developed for the metropolitan area of Tel-Aviv, Israel and currently at its final implementation stages. The case study showed how one can develop such an advanced model that on one hand captures the key behavior aspects and policy sensitivities, and on the other hand, is practical and requires reasonable computational resources so that it can be widely used for decision-making. Extension of activity-based model to longer term decisions such as auto ownership and residential location were also discussed.



The Future of Private Infrastructure

At the Visiting Scholar Seminar, hosted by The University Transportation Research Center, José A. Gómez-Ibáñez, Derek C. Bok Professor of Urban Planning and Public Policy at John F. Kennedy School of Government, and Graduate School of Design Harvard University, spoke to an audience of about 150 people about the extent private provision of infrastructure has been successful in developing countries and what that experience suggests for the future of private investment in the United States.

His talk, "Private Participation in Infrastructure: Real Efficiency Gains vs. Transactions Costs," emphasized that there is a difference between true cost savings, resulting in real efficiency gains, and cost shifting causing costs to merely transfer from one party to another. To achieve true success, efficiency from more or better output with the same or fewer inputs, is necessary. Some examples of cost shifting include charging higher prices for the same services, shedding excess labor into an existing weak labor market, or just a shift in whether a public or private entity provides financing.

According to Dr. Gómez-Ibáñez, privatization in developing nations began around 1989 in the areas of telecommunications, energy, transport and water with about 1.3 trillion dollars being invested privately since 1990, with varying trends by sector. Before that, utilities were privately owned during the 19th century and became public after World War II. Results have shown that there are limitations to private capital in terms of achieving efficiency, however. Negative influences have included non-efficiency motivations for privatizing, cancellations, and expected economic surges and slowdowns by region and sector. Some motives, for example, such as immediate budget relief achieved through divestiture or tapping into private capital markets by selling concessions of a new infrastructure do not necessarily achieve more output for less or the same input.

Economic downturns and volatile contracts also contribute to problems. Dr. Gómez-Ibáñez cited several high profile controversies from private investment in infrastructure from 1990 to the present in both developing nations and the United States.



Examples of privatization in the United States come from trends with financing of U.S. highways, the first round from 1986-1995 and the second after 2000 involving new toll roads, monetizing existing toll roads and initiating tolls on the approximately 40,000 miles of the un-tolled U.S. Interstate System.

Issues that need to be worked out include dealing with the mistrust of foreign investment in the U.S. or developing more domestic financing options, political risk in developing countries, transaction cost levels and regulations of contracts. Dr. Gómez-Ibáñez concludes that private participation is "economically sensible and politically acceptable" when efficiency gains are high with little cost transfer and low transaction costs.

This presentation was co-sponsored by NYU Wagner Rudin Center for Transportation Policy and Management, CUNY Institute for Urban Systems, Port Authority of New York and New Jersey, and the New Jersey Department of Transportation.

Self cleaning and de-polluting coatings and possibilities for transportation structures

At the NJDOT Technology Transfer Seminar, on October 1, 2008, Dr. Perumalsamy N. Balaguru, Distinguished Professor, Civil & Environmental Engineering, Rutgers University gave a presentation on self cleaning and de-polluting coatings and possibilities for transportation structures.

The primary focus of the presentation was the various demonstration projects for protective coatings and strengthening applications. So far six demonstration projects have been carried out for NJ DOT, New England transportation consortium and Maryland . The basic information about the coating and some test results were be presented. A short demonstration on graffiti resistance was also presented.

Dr. Perumalsamy N. Balaguru is a Distinguished Professor of Civil Engineering at Rutgers The State University of New Jersey, USA and just completed a four year assignment as Program Director for Infrastructure Materials and Structural Mechanics at National Science Foundation. He has taught 18 different courses in the areas of Construction, Composites, Materials, Mechanics, Structural Analysis including Finite Element Methods and Structural Design Using Composite, Steel, Reinforced Concrete and Prestressed Concrete. He has directed 25 PhD and M.S. Dissertations in the areas of his research interest, which include: fiber reinforced cement and polymer composites, construction management, new construction methods, structural analysis and structural design. He has authored a book on Fiber Reinforced Cement Composites, published by McGraw - Hill, edited three books in the areas of concrete, published more than 200 papers in Journals and Proceedings and made more than 250 presentations in International Conferences all over the world.

His honors and awards include: Best Teacher of the Year award twice (1982 and 1993), Fellow of American Concrete Institute and an Award for Recognition of Longstanding Contributions to Ferrocement from International Ferrocement Institute. He is listed in a number of Directories including Who is Who in America.



Dr. Perumalsamy N. Balaguru,
Distinguished Professor of Civil Engineering at Rutgers



THE PARADIGM OF MOBILITY: A Radical Change in Urban Transport to Challenge Sustainability

The University Transportation Research Center hosted a seminar featuring two visiting scholars; Georges Amar, Head of Prospective & Innovative design team of Paris Public Transport Company and Dominique Laousse from Paris Public Transport Company, RATP.

RATP, the major transit operator responsible for public transportation in Paris and its surroundings, has employed an innovative and provocative group of thinkers to aid in their planning for the future. Unlike many U.S. transit properties, or transportation agency, where planning is simply matching estimates of future demand to changes in supply, RATP asks, "What will the mobility needs of future Parisians be?" Changing demographics, emerging cultural shifts, economic shifts, attention to the environment - all add to the complexity of responding to this question. So RATP works with experts, not only in technology, but also the social sciences, and arts and letters. RATP does not believe this is a luxury, but is indeed a necessity - for RATP is as much a part of the culture of Paris as are the cafés and left bank (La Rive Gauche). So what will the future hold? Our Visiting Scholars write:

"Like many other fields, transport is undergoing intense and sometimes paradoxical innovation. Although it is less able than ever to predict the future, the prospective task is to hint and formulate the emerging paradigm, which implicitly underlies present and coming changes. In our field of transport and mobility, we will successively analyze three main aspects of this shift: 1) deep evolution in the uses and values of mobility; 2) unexpected innovations in the tools and means of mobility; and 3) changes and new actors in mobility profession."

In their presentation, both scholars shared their ideas with a broad and responsive audience.

This presentation was co-sponsored by CUNY Institute for Urban Systems, NYU Wagner Rudin Center for Transportation Policy and Management, Port Authority of New York and New Jersey, New Jersey Department of Transportation and United Department of Transportation.



Georges Amar,
Head of Prospective and
Innovative Design Team (RATP)



Dominique Laousse, RATP



10th Annual New Jersey Department of Transportation Research Showcase

The New Jersey Department of Transportation held its 10th Annual Research Showcase on October 16, 2008. This year's event was hosted by Rutgers University and was held at the Conference Center at Mercer located in West Windsor. The presenters from various public and private sector entities from the New Jersey and New York State Transportation fields gathered to share their research activities within the region. The focus of the event was to highlight the research activities being conducted by NJDOT's various university partners.

The showcase comprised six major areas of transportation planning and regulation. These were; Multimodal/Intermodal Programs, Congestion/Intelligent Transportation Systems, Project and Asset Management, Infrastructure and Bridge Preservation, Safety and Environment.

University Transportation Research Center and the members of UTRC consortium presented their research studies. These presentations at the end of the showcase leave an impact on the administrators, practitioners, decision makers and stakeholders and give them an understanding of regional transportation needs. It also creates availability for new ideas on planning and management to benefit facility costs and community members.

The NJDOT Bureau of Research has sponsored this program at no cost to the participants. The University Transportation Research Center participated in the showcase with speakers and poster sessions to showcase our research efforts.



NJ Showcase Student of the Year Award

Also at the Research Showcase, Mr. Guangyong Liu was awarded a 2008 NJDOT Research Showcase Student Award on October 16, 2008.

Mr. Liu is currently a Ph.D. student at the City College of New York with Professor Anil K. Agrawal. Prior to joining the City College of New York, Mr. Liu received his M.S. Mechanical and Aerospace Engineering from the University of California, Irvine. Mr. Liu has been working on the New Jersey Department of Transportation project "Seismic Design Considerations" to develop seismic guidelines for existing bridges on New Jersey. Mr. Liu has a very strong background in solid mechanics and modeling of complex structural systems. For his Ph.D. research, Mr. Liu has been working on the development of multihazard blast, seismic and vehicle impact guidelines for highway bridges". This is a highly complex and urgently needed guideline for design of sustainable highway bridge systems in the country. This is a cutting edge research that is being led through the sponsorship of NJDOT and UTRC.

Transportation and Oil Prices: From Modal Shift to Supply Chain Propagation

During a NJDOT Technology Transfer Seminar, Jean Paul Rodrigue, Associate Professor, Department of Economics and Geography at Hofstra University, gave a presentation on "Transportation and Oil Prices: From Modal Shift to Supply Chain Propagation."

We are in the midst of a Third Oil Shock which since late 2003 has seen oil prices essentially quadruple. Although forecasting future oil prices is subject to much speculation, there is a growing consensus that they are likely to remain high. Since about 95% of all transportation activities are reliant on the consumption of petroleum, no other economic sector will be as deeply impacted by higher energy prices. Yet, the nature and extent of these potential impacts remain to be comprehensively assessed, particularly in light of the peak oil debate. There are a wide range of scenarios that are being considered ranging from the very pessimistic with extreme long term impacts to a temporary setback. The presentation tried to shed some light on the transportation and oil prices paradigm by focusing on six major categories of potential impacts, both for passengers and freight transport systems. The first considers the concept of demand destruction as users are rationalizing their transport demand in light of new market conditions. The second deals with modal shift as existing or alternative forms of transportation gain in market share because they have become more cost effective. The third is concerned by changes in the service area of transportation modes and terminals as the friction of distance turns out to be more prevalent. The fourth addresses to what extent major carriers are reconsidering the choice of their hubs, notably in the maritime and air transport sectors. The fifth, in line with the previous, considers which forms of network reconfiguration will take place as transportation modes that were used for long distance services, namely trucking, are reallocated for shorter distances. This will favor a higher level of intermodal integration. Last, a more general analysis about how higher energy prices will propagate within supply chains as managers reconsider established practices, which so far were based on low oil prices. For instance, there is growing evidence that China has lost a lot of its appeal as a low cost manufacturer in light of higher production and shipping costs.

Jean-Paul Rodrigue received a Ph.D. in Transport Geography from the Université de Montréal (1994) and has been at the Department of Economics & Geography at Hofstra University since 1999. In 2008, he became part of the Department of Global Studies and Geography.



Identification of Source of Rutting in a Flexible Pavement System

At the NJDOT Technology Transfer Seminar on October 29, 2008, Dr Yusuf Mehta, Associate Professor, Civil and Environmental Engineering, Rowan University gave a presentation on Identification of Source of rutting in a flexible pavement system.

The primary objective of this proposal was to develop a framework to identify the most likely source of rutting within the pavement system and the presence of mixture instability in the surface layer within the first few years of the pavement life. Currently, the only accurate method of identifying the source of rutting is to cut trenches and observe deformation in the various layers of the pavement structure, a process that is inconvenient, destructive, and expensive. The proposed system encompasses analysis of routinely collected data including rut profile, measurement of air voids (AV) content from field cores, and back calculation of in-situ moduli of each of the layers. The proposed approach for evaluating rutting integrates the use of Falling Weight Deflectometer (FWD), field core data, along with 12 to 15-ft transverse profile measurements to assess the contributions of different pavement layers on rutting, and identify the presence (or absence) of instability within the asphalt surface layer.

The proposed procedure is unique in the sense that it is independent of the rut depth magnitude, a feature that allows the early identification of rutting and instability of the surface layer so that the appropriate corrective action for remediation can be taken. The researchers are aware that sufficient data may not be available to conduct this analysis. To quantify the risk, an analysis was conducted by comparing the difference in performance prediction and/or design life between those obtained from transverse profilograph (TP) and road surface profiler (RSP). To accomplish this task, the following tasks were conducted:

- a. Predict failure based on proposed procedure using transverse profilograph (TP) measurements.
- b. Predict failure based on proposed procedure using road surface profiler (RSP).
- c. Compare the difference in performance prediction and/or design life between those obtained from TP and RSP using the proposed analysis.

The risk assessment showed that if agencies, in general, observe significant rutting in their states then they should use the proposed procedure rather than rut depth measurements from RSP. This procedure provides the necessary tool for the state agencies to implement appropriate pavement rehabilitation strategies. The research team aimed to present these findings at various forums such as the New Jersey and Florida Departments of Transportation. In addition, presentations at various conferences and workshops were also planned to be made.



Research

Program Objectives



The research program objectives are (1) to develop a theme based transportation research program that is responsive to the needs of regional transportation organizations and stakeholders, and (2) to conduct that program in cooperation with the partners. The program includes both studies that are identified with research partners of projects targeted to the theme, and targeted, short-term projects. The program develops competitive proposals, which are evaluated to insure the most responsive UTRC team conducts the work.

The research program is responsive to the UTRC theme: "Planning and Managing Regional Transportation Systems in a Changing World." The complex transportation system of transit and infrastructure, and the rapidly changing environment impacts the nation's largest city and metropolitan area. The New York/New Jersey Metropolitan has over 19 million people, 600,000 businesses and 9 million workers. The transportation systems that serve Region 2, both multi-modal and intermodal must serve the customers and stakeholders within the region and globally.

Under the current grant, the new research projects and the ongoing research projects concentrate the program efforts on the categories of Transportation Systems Performance and Information Infrastructure to provide needed services to the New Jersey Department of Transportation, New York City Department of Transportation, New York Metropolitan Transportation Council, New York State Department of Transportation, and the Port Authority of New York and New Jersey while enhancing the center's theme.

Self-Organized Transport System

Traffic lights are primarily controlled individually, but there has been some work on synchronization of multiple traffic lights. This synchronization is usually done in one direction based on traffic volume, but this often leads to unneeded traffic delays in other directions. Several dynamic control systems have been proposed for traffic control based on traffic flows across multiple light signals; however, most of these are controlled at and communicate with a central location. Issues associated with such central control, include: scalability, resilience, and latency. As the number of traffic lights increases, it becomes exponentially difficult for them to be centrally controlled since increases in the number of variables lead to subsequent increases of computational complexity. Also, since the controls are not typically programmed to deal with exceptions, any traffic anomalies result in significant traffic disruptions. Finally, in a centralized system, there are often delays in acquiring, processing, and relaying information across multiple traffic signals. To deal with the issues associated with a centralized control system, the research team proposes a distributed solution based on the concept of self-organization.

In this work, researchers will define parameters that can be used to characterize traffic, identify constraints for traffic lights, and determine rules of self-organization for the traffic signals. As a part of this work, researchers will identify metrics to measure performance and scalability with respect to traditional dynamic traffic control approaches. A simulation for a self-organized traffic system will be developed to model this self-organizing behavior. Feasibility of such a transport system will be evaluated through the simulation and the performance of this system will be evaluated in context existing systems.

Sponsor:
United States
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Seismic Design Recommendations

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Despite of New Jersey being a region of low seismicity, the implications of seismic hazard to highway bridges in NJ are quite severe. Hence, increasing the seismic resistance of highway bridges through detailed seismic design and retrofit planning is essential. This proposal offers to develop seismic design and retrofit guidelines specifically for New Jersey bridges through in-depth and critical review and analysis of all available documents and in particular the new guidelines by AASHTO and FHWA.

The main objective of the proposed research is to develop recommendations on adoption of these documents by NJDOT for seismic design and retrofit of highway bridges. The specific objectives of the proposed research are the preparation of guidelines for seismic design of New Jersey bridges, the preparation of guidelines for retrofit of existing bridges, the development of classification and importance categories for New Jersey bridges, the recommendations on acceptable retrofit options and guidelines on the implementation of these retrofit options for New Jersey bridges, and the development of computer models and examples illustrating applications of guidelines for the design of new bridges and retrofit of different types of bridges.

Design and Evaluation of Effective Crosswalk Illumination

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New Jersey Department of Transportation

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This research study aims to investigate promising lighting approaches to assist NJDOT in the development of eventual specifications for illumination at crosswalks. The goal is to maximize safety at crosswalks, both at intersections and at mid-block crossings.

The objective of the proposed research is to identify the most promising lighting concepts, and technological solutions, for the reduction of incidents involving pedestrians and vehicles in NJ crosswalks. Through the research tasks to be conducted, the project team will identify systems that balance the visual needs of drivers and pedestrians (balancing visibility and glare) with cost and energy characteristics, ease of use, and potential for abuse of the system through prank use.

The characteristics of the proposed system will be refined through photometrically and photorealistic simulation calculations and renderings, scale model laboratory investigations, then by controlled field studies conducted outdoors on off-road locations, and finally through a limited mock-up deployment of the final candidate system on a crosswalk in NJ with evaluations to be conducted by transportation and public safety professionals and by a sample of pedestrians and drivers.

Based on the results of the proposed research tasks, the research team will develop a recommendation that could eventually be incorporated into a specification for crosswalk lighting, with warrants for modifying the system based on specific site characteristics (e.g., age of pedestrians in the adjacent neighborhood, location of crosswalk in an intersection or mid-block, traffic and pedestrian density, etc.).



Vehicle Impact Assessment

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The New York State Department of Transportation (NYSDOT) is experiencing close to 200 bridge hits a year. These accidents are attributed to numerous factors including: improperly stored equipment on trucks; violation of vehicle posting signs; illegal commercial vehicles on parkways, etc. The objectives of this research are to: Review the major factors contributing to bridge impacts for each bridge that the NYSDOT bridge hit database identifies as being hit multiple times during the last five years; Provide recommendations to the NYSDOT on means of reducing the likelihood of future bridge hits to those frequently hit bridges; Provide long term, feasible and economical suggestions to reduce the likelihood of bridge hits for the complete population of bridges in New York State; and review and comment on the NYSDOT Collision Vulnerability Assessment Procedure and provide recommended improvements.

The focus of this research will be on commercial vehicles hitting structural members of bridges above, as well as those vehicles that hit structural members located above the roadway, such as through girders and truss members. This study is not concerned with auto accidents that occur on or below bridges and strike the bridge in the process. Nor is this study about water vessels colliding with highway bridges.

The outcome of the research will be a report documenting contributing factors for bridge hits at specific locations; recommendations to reduce the likelihood of bridge hits at specific, frequently hit bridges; recommendations to reduce the incidence of bridge hits on the general bridge population; industry education outreach materials; and a computer program to analyze bridge hits data systematically and regularly.

Modeling Air Quality and Energy Impacts of NYSDOT Highway ROW Management

Sponsor:
New York State Department of Transportation



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Performing Organization:
Cornell University

Off-road gasoline mobile sources, including vegetation control measures, emit a significant part of gasoline-powered mobile source related HC and NO_x exhaust and evaporative emissions (roughly 30% in California, >15% in New York State). Although both on-road and off-road emissions are trending downward as a result of state regulations, the off-road percentage contribution to the total gasoline-related mobile source inventory is increasing. From the exposure perspective, a large segment of the population uses small, gasoline-powered spark-ignition (SI) lawn and garden equipment on a regular basis. Emissions from many of the small SI engines powering this equipment may lead to elevated air pollution exposures for a number of gaseous and particulate compounds, especially for individuals whose occupations require the use of these engines daily, such as landscapers and the vegetation control personnel at state/local DOTs. Emission studies with lawnmowers suggest a potential for high exposures during the equipment operation. Research literature has reported elevated CO personal measurements related to chainsaw use, with short-term concentrations exceeding 400 ppm for certain cutting activities.

These issues of emissions, exposure, and energy consumption associated with vegetation controls are of particular concern to New York State Department of Transportation (NYSDOT), which owns about 1% of the land in New York State, much of which is associated with highway right-of-way (ROW). In order to properly manage the ROW, a variety of oftentimes competing risks must be identified, evaluated and prioritized. In particular, knowledge about energy expenditure and emissions from ROW management practices, identification of factors that affect such energy consumption and emissions, and scientifically-based recommendations of practical guidelines in these operations are desirable for the NYSDOT to implement successful fuel saving and emission control strategies.

The purpose of this project is to quantify emissions and energy consumption associated with various vegetation control measures by providing real world assessment of the emissions and fuel use associated with NYSDOT ROW vegetation management. The project is designed to measure exhaust emissions for typical ROW vegetation control field operations.

Emissions factors can be developed from these measurements, and extrapolated to a state or regional scale using the project data in combination with specific fleet operation information. The emissions factors will then be used to model various scenarios to assist in selection of maintenance practices that minimize the impacts associated with vegetation management.

Develop Consultant Management Estimating Tool

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Sponsors:
New York State Department of Transportation
United States Department of Transportation

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The New York State Department of Transportation (NYSDOT) Consultant Management Bureau's primary responsibilities are to negotiate staffing hours/resources with engineering design consultants, and to monitor the consultant's costs. Currently the Consultant Management Bureau uses knowledge of past and current projects as well as engineering judgment to estimate consultant costs. The objective of the research project is to produce and calibrate a computer based design agreement estimating tool that uses a database of historical project information to produce budget estimates of consultant staffing.

This research will help NYSDOT in the establishment of a central database that contains historic total project cost and staffing level data. The development of a computer based estimating tool that employs the data from the historical database to provide more accurate and efficient estimates of consultant resources and the identification of the major variables that affect the consultant's hours and develop predictive models will be performed.

NYSDOT already employs an excel spreadsheet based estimating tool. The study will determine how to best integrate the new computer tool with the existing spreadsheet and will also explore how the developed estimating tool can exchange data with Primavera software. At the completion of the project, training will be provided and a user's manual will be developed to assist Consultant Managers using the system.

Potentially this research can result in cost savings to the NYSDOT by providing an improved decision making tool to Consultant Managers negotiating contracts.

Diesel Retrofit Assessment

Cleaning up the existing diesel engine fleet to reduce diesel emissions and public's exposure risk remains a challenge and opportunity in New York State (NYS) and across the country. Efficient retrofit devices need to be identified according to specific diesel engine characteristics/duty cycles and used in the right application.

The New York State Department of Transportation (NYSDOT) is mandated by law to retrofit many of its existing 7000 pieces of diesel vehicles/equipment (between 1 and 30 years old) in all classes and sizes with "Best Available Retrofit Technology." While the benefit of retrofitting the NYSDOT diesel engine fleet is significant, the investment needed is also sizable. To meet such a challenge with limited funds and other operational constraints, cost-effective technologies, feasible emission reducing practices and guidelines, and well-designed NYSDOT deployment programs are all crucial.

Optimizing diesel retrofit deployment is a difficult undertaking for State program and project managers; but the right combination of diesel retrofit decision supporting information systems and practice guidelines will lead to an improvement in the program's overall effectiveness. To provide the NYSDOT and potentially other state and local diesel vehicle operating agencies with the most useful scientific and empirical information for cost-effective diesel emissions reduction, this research proposes a comprehensive and systematic study of diesel retrofit targeting the NYSDOT diesel engine fleet. Key information factors to consider in the study will include a diesel engine fleet inventory database with detailed parameters pertinent to retrofit emissions, duty/driving cycles of different categories of diesel engines/vehicles, a fund allocation and engine selection methodology that takes into account all relevant restricting factors, a rigorous retrofit deployment procedure, cost-benefit analysis, and careful after-retrofit performance tracking system and database.

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The diesel retrofit puzzle extended: optimal fleet owner behavior over multiple time periods



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Diesel particulate matter (PM) emissions have been estimated to cause more negative health impacts and premature deaths in New York City (NYC) than any other US city. Heavy-duty diesel vehicles emit roughly 10 times the number of particles as gasoline passenger cars, and contribute to extremely high ultra-fine particle concentrations near major roadways.

To combat particulate pollution in the region, NYC has taken serious actions to reduce particulate pollution from diesel sources. Through the Clean Fuel Bus Program, NYC Transit has purchased the largest hybrid-diesel electric bus fleet in North America, and by the end of last year, had retrofitted all of the conventional diesel transit buses with diesel particle filters.

However, given the complexity (e.g., technical, regulatory, financial, operational factors), size and funding requirement of diesel retrofitting, much research needs to be done to achieve cost-effective clean-up of the existing diesel fleets. In "The Retrofit Puzzle: Optimal Fleet Owner Behavior in the Context of Diesel Retrofit Incentive Programs," a program was developed to model profit-maximizing diesel fleet owner behavior when selecting pollution reduction retrofits. Fleet owners acted in the context of potential government programs including various mandates and financial incentives. Fleet size and the miles remaining for each vehicle were treated as fixed and known at the time retrofits are made. Retrofits were assumed to take place in the present, but benefits and costs are distributed over time. The model was intended as a tool both for fleet owners and for government administrators.

In this proposal, the model will be expanded to allow for retrofits at multiple stages in time. This enhancement enables the model to develop multi-year strategies for retrofit implementation, a capability that is especially important when changing government

regulation and incentives, vehicle availability, new retrofit technologies, or other factors make spacing retrofits out over time the most profitable option.

A case study in New York State will be used to demonstrate how a sample fleet owner would respond to various incentives.

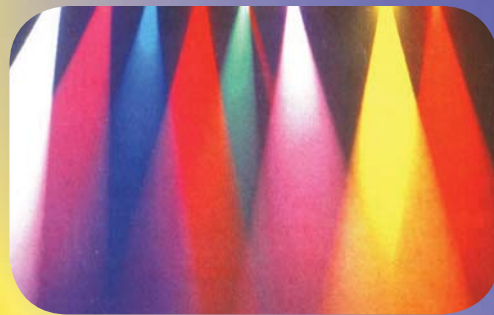


Light isn't just for vision anymore: implications for transportation safety



In 1998, nearly 30% of all fatal accidents involving large trucks occurred during hours of darkness, according to the Federal Motor Carrier Safety Administration's Large Truck Crash Profile report. In about 1.5% of crashes involving large trucks, police reported that drivers visibly appeared to be fatigued or very tired. More than 7% of single-vehicle fatal truck accidents were reported as having driver drowsiness or sleeping as a related factor. The National Highway Safety Administration (NHSTA) reports that 56,000 automobile accidents per year are caused by drivers falling asleep at the wheel. According to the 1990 World Almanac, each accident involving a fatality or very serious injury results in a cost of nearly \$1.5 million, simply accounting for wage losses, medical expenses and insurance administration.

In principle, light can be used as a non-pharmacological treatment for increasing alertness at night and thereby possibly reducing sleep-related traffic accidents. Recent research has begun to illustrate the many ways that light and lighting systems affect humans in terms of circadian photobiology, including the characteristics of light necessary to regulate the circadian system.



While further research is no doubt necessary before lighting criteria for the circadian system will have equal weight as visual criteria in the design of transportation lighting systems, it is becoming increasingly evident that lighting practice will eventually have to consider circadian photobiology. One major barrier before circadian photobiology can be considered in transportation application is how light for the circadian system can be introduced without significantly increasing disability glare and reducing night-time visual performance.

The goal of this proposal is to investigate how disability glare and visual performance of night-time driving will be affected by a lighting system that is designed to increase night-time alertness. This study propose to also determine for how long the alerting effects of night-time light remains after light stimulus offset, which has significance if "light showers" are introduced in rest-stops facilities instead of inside truck cabins.

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Sponsor:
United States
Department of Transportation

Long Island 2035: Building Public Consensus ~ Phase 1

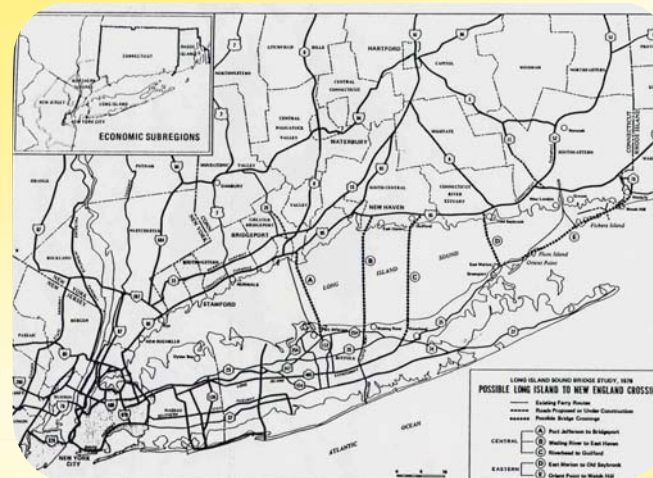
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United States Department of Transportation
New York Metropolitan Transportation Council

Performing Organizations:
The City College of New York
Hunter College
Stony Brook - SUNY
Old Westbury - SUNY

A number of recent efforts have created a receptive environment for new approaches to regional growth and development. On Long Island, projects such as the Long Island Index have generated a widespread recognition and discussion of common problems and potential solutions. In the larger New York region, the New York Metropolitan Transportation Council's (NYMTC) recently announced Shared Goals and related action strategies for the region are a welcome effort to improve the integration of transportation planning with land use, economic and environmental objectives. This study would assist in this effort by developing broader public consensus for a shared vision of where the next generation of residents should be housed, the transportation systems needed to support these settlement patterns, and the institutional actions required to insure that prosperity is broadly and equitably shared. The initiative would launch a regional planning effort on Long Island similar to projects in metropolitan regions across the United States that have used new technologies and an inclusive public process to successfully develop and implement regional action strategies.

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Designing, Developing, and Implementing a Living Snow Fence Program for New York State

Performing Organization:
College of Environmental Science and Forestry, Syracuse

Sponsors:
New York Department of Transportation
United States Department of Transportation



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This project is designed to further our understanding of the design and installation of living snow fences in New York and transfer this knowledge to practitioners. A review of the literature on living snow fences and lessons learned from living snow fence programs in other states will be conducted and used to develop guidelines for design, installation, and maintenance of living snow fences. These guidelines will be used to prepare training documents and presentations, which will be presented to NYSDOT staff through a series of interactive and hands-on workshops, the last two of which will be run by NYSDOT staff.

Protocols will be developed, based on review of the literature and field experience, for site assessment prior to design and installation. A second set of protocols will be developed for field assessment of operationally-mature living snow fences. A network of living snow fences installed in the past few years in New York will be used to evaluate protocols. Data collected on established and prospective sites will also be used to develop a cost-benefit model for living snow fences in New York. Throughout the duration of the project, these protocols, as well as training materials will be tested, updated, and revised using an adaptive management approach to further our understanding of how these systems work and how best to transfer this knowledge to practitioners.

Pedestrian Fatality and Severe Injury Accidents in New York City

The New York City Department of Transportation (NYCDOT) has identified pedestrian safety and mobility as high priorities and has devoted significant resources to pedestrian safety improvement programs.

A variety of safety programs and initiatives have been implemented by NYCDOT over the past fifteen years. Such programs and initiatives appear to have been successful.

According to a recent report by NYCDOT, overall pedestrian fatalities declined by 55.7 percent between 1990 and 2006.

In 2005, of 32 cities in the United States with populations exceeding 500,000, New York was ranked the 10th safest city, with a pedestrian fatality rate of 1.85 per 100,000 persons. This number is lower than the average fatality rate (2.33) for those 32 cities, and significantly lower than cities like Jacksonville, Florida and Detroit, Michigan, which have fatality rates of 4.34 and 4.19, respectively.

Despite such improvements in pedestrian safety, pedestrians in New York City are still more vulnerable to motor vehicle-related crashes than those living in other parts of New York State or the United States. According to NYCDOT, the number of pedestrian fatalities as a percentage of total traffic fatalities has remained at roughly 50 percent since 1990. The share of pedestrian fatalities as a percent of total motor vehicle-related fatalities in 2005 was significantly higher for New York City than for New York State or for the United States as a whole.

Recognizing that a multitude of factors impact pedestrian safety and that these factors may vary not just nationally, but within cities, the research will identify specific locations and means for further improving pedestrian safety in New York City.

The goals of the proposed study are three-fold: (1) to identify priority locations for pedestrian safety engineering (and design) treatments; (2) to identify priority treatments by location type; and, (3) and to suggest recommendations based on the 5 E's of safety - Engineering (and design), Enforcement, Encouragement, Education, and Evaluation.

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Sponsors:
New York City Department of Transportation



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Utilizing Remote Sensing Technology in Post-Disaster Management of Transportation Networks

Infrastructure system components such as bridges, highways, tunnels, traffic systems, road pavements, and other systems are considered assets that should be protected and properly managed. Yet, the degree of deterioration and the risk of exposure to natural (e.g., earthquakes, floods, etc.) as well as malicious disasters are dangerously high. Major decisions must be made to allocate the available but limited funds for maintaining and safeguarding of our national infrastructure network. Additionally, transportation services play an important role in post-earthquake recovery and are an integral part of most response functions. These services are vital for the initial rescue operations and disaster assistance. In addition, traffic delays that occur during the reconstruction period can be greatly minimized through effective traffic management strategies. The need for vulnerability assessment and disaster mitigation in densely populated areas such as in the NY/NJ metropolitan area is obvious.

This project will use novel remote sensing technologies to quickly assess damage to the transportation infrastructure. Some of the latest remote sensing technologies can detect very small displacements of infrastructure elements such as roads and bridges up to centimeter accuracy. Thus, this information along with historic information about transportation infrastructure components combined with simple yet accurate structural engineering models can be used to determine, individual components of a given network that are susceptible to failure under various loading conditions. This probabilistic failure mapping of the infrastructure can then be used to develop robust transportation and emergency response plans that minimize the risk of disruptions.

It is obvious that the need to establish disaster preparedness plan and post-disaster mitigation resource is urgent. The NY/NJ metropolitan area is one the densely populated corridors in the USA with vital infrastructure facilities that are subject to possible scenarios of cascading events such as earthquakes, hurricanes, floods, and man-made disasters. The information obtained from remote sensing technology is important in providing reliable support for the decision-making system for preparedness and mitigation.

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Defining the Shared Goals of the NYMTC Principals and Related Future Trends

Over the course of the past two years, the New York Metropolitan Transportation Council (NYMTC) Principals have reached consensus on five shared goals which serve as the framework for making decisions on future investments in the region's transportation network, and reflect broad agreement on the need for regional approaches to complex issues facing the region: Build the case for obtaining resources to implement regional investments; Enhance the regional environment; Improve the regional economy; Improve the regional quality of life; Provide convenient, flexible transportation access within the region.

These Shared goals require greater definition and prioritization. Furthermore, the specific mechanisms for fostering coordination and cooperation on each of these shared goals have not yet been identified and clearly linked to each of the goals.

The study proposes a twelve-month research and inquiry initiative that would serve the following purposes: Help the Principal members of NYMTC characterize more clearly each of the five shared goals; Aid in defining and reaching consensus around objectives to be derived from each of the goals; Establish a group of measures of success that could be tracked to demonstrate whether the shared goals and objectives are being met and are achieving their desired outcomes; Identify the key trends - politically, demographically, socio-economically, technologically - that are likely to have an impact on the shared goals and objectives, and the manner in which they are most likely to prove achievable;; and, Develop recommendations for integrating the shared goals and objectives into the region's formal transportation planning process.

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Develop Guidelines for Traffic Signal Energy Back-UP Systems

Performing Organization:
Rensselaer Polytechnic Institute

Sponsors:
New York State Department of Transportation
United States Department of Transportation



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Power outages affect traffic signalized intersections, leading to potentially serious problems. Current practices of operating these intersections are somewhat primitive, ranging from 'do nothing' to installing portable generators. As stated in the RFP during the years 2003 and 2004, 80 - 90% of dark signal accidents resulted in injuries compared to 33% for the average New York State accident. The goal of this project is to evaluate and make recommendations about power alternatives when the primary power to a signal fails. These recommendations will cover a variety of different alternatives so that cost effective options may be available for a range of intersections. Along with the alternative power recommendations the Consultant shall provide guidelines for selecting intersections to outfit with these power sources.

In addition to providing guidelines to ensure uninterrupted power service at critical intersections there are other benefits. With the addition of an alternate power source to the New York State Highway Traffic Signal System, the increased injury rate that occurred during signal outages would significantly decrease, creating a safer, more reliable transportation system. The integrity of the mobility at the intersections would remain uncompromised, eliminating the confusion between motorists caused when a signal goes dark. If a major evacuation was underway and the signal system was not functioning, major delays would be present; if the signals were still operating the mobility would be less affected.

Improvements on NYMTC Data Products

Performing Organization:
Rutgers University
The City College of New York

Sponsors:
New York Metropolitan Transportation Council
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In issuing this Request for Proposal, the New York Metropolitan Transportation Council (NYMTC) allies itself with the leading agency in this country in their efforts to modernize the existing data products and improve the communication between the agency and the public.

NYMTC is an association of governments, transportation providers and environmental agencies that is the metropolitan planning organization for New York City, Long Island and the lower Hudson Valley. NYMTC's mission is to serve as the collaborative forum to address transportation-related issues from a regional perspective; to facilitate informed decision-making within the Council by providing sound technical analyses; to ensure the region is positioned to capture the maximum federal funds available to achieve the goals of the Unified Planning Work Program, Regional Transportation Plan and Transportation Improvement Program; and to focus the collective planning activities of all Council members to achieve a shared regional vision.

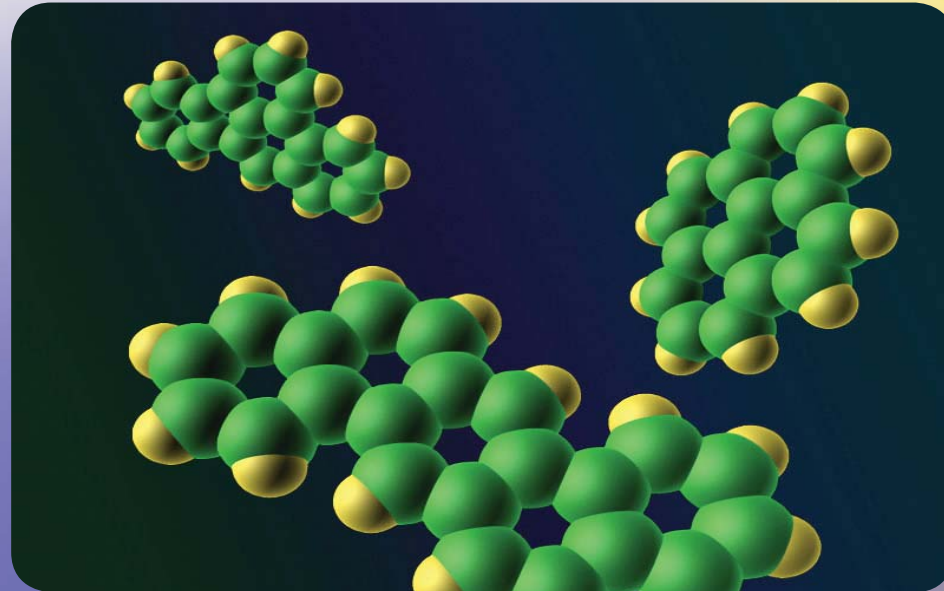
In order to fulfill its mission, NYMTC produces an array of information in support of the planning and policy decisions that shape the region. This information is produced in the form of various reports, brochures and databases, and "is used by many transportation specialists and academics both in the NYMTC region and outside the region as well as people from other countries". Thus, NYMTC wants to ensure that its data products are "current, accurate, consistent, and contain the information that can be used easily by users and serve their needs properly"; i.e., an overall quality of the data products is desirable. Therefore, it is essential to carry out a project that examines the data products and makes recommendations for further improvements.

Development of Highly Sensitive Portable Hydrocarbon Sensors

Performing Organization:
The State University of New York at Albany

Sponsor:
United States Department of Transportation

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The testing of soil samples is performed during all phases of DOT related construction (planning, building, and post construction). This is done to ensure that the soil removed is not contaminated and when construction is complete to ensure that the environmental impact of the structure is minimized. NYSDOT spends approximately \$10-12M/yr on the testing of soil and groundwater samples, which does not include the NYCDOT. By moving the majority of these tests from an off-site analytical lab, to a field portable device the overall cost of construction budgets will be significantly lower and construction projects will experience fewer delays due to untimely analytical lab reports.

The proposed work will support a graduate student and by leveraging the NYSDOT program an additional 2 graduate students and a postdoctoral associate will provide additional assistance to the hydrocarbon sensor program. Furthermore the work will be performed at the College of Nanoscale Science and Engineering at the University at Albany - SUNY which is establishing a research focus center based on the development and integration of a range of technologies to enable sensor systems deployment in a range of environmental applications. These technology focus areas include: 1) Chemical and physical sensors, 2) Radiation hard materials, 3) Corrosion resistant materials, 4) Self cleaning and healing systems, and 5) Intelligent sensor networks. The proposed research initiative would likewise leverage research initiatives housed within this research center.

Hot-Spot Analysis of Fine Particles (PM_{2.5}) for Environmental and Health Impacts Assessment of Transportation Emissions in South Bronx

Hot-spot analysis, also known as project-level analysis, assesses impacts of transportation emissions on local air pollution of carbon monoxide (CO) and particulate matter (PM). It is required for regional transportation plans (RTP), transportation improvement programs (TIP) and transportation project development/modification by transportation conformity rules and the National Environmental Policy Act (NEPA) process. Such transportation conformity studies are particularly important in non-attainment areas and locales with concentrated and heavily traveled transportation infrastructures (e.g., major transportation corridors, border crossings, congested intersections, etc.).

This study proposes to develop an advanced process-based hotspot analysis model of fine particulate matters. By "process-based", the model aims to take into account key chemical reactions and physical dynamics that govern the evolution of fine particles as they disperse from road sources to near road receptors. The team will first develop an advanced single-link, processes-based dispersion model (SPDM). To apply it in the multi-link environment typical of major metropolitan areas, the roadway system within the study area will be divided into discrete segments of varying link geometry so that each segment can be effectively treated as a single, straight line source. Thus the SPDM can be employed for each element. The impact of each element will be integrated to yield the total of multiple highways. The resultant product is a multi-link, processes-based dispersion model (MPDM).

The study has been motivated by the transportation and air pollution problems in the South Bronx, New York City (NYC). As a case study, this model will be applied to the South Bronx, which is encircled by major highways. The Bronx has been the New York City borough with the highest overall rates of asthma hospitalizations, deaths and prevalence among children as well as adults. Recent studies have linked asthma to exposure to diesel particulate matters from transportation emissions in the South Bronx. We will compare the model results of PM_{2.5} and black carbon concentrations from hot-spot analysis to intensive measurement data previously collected by researchers from New York University.

The study will mark a critical step toward the next generation hotspot modeling, providing transportation policy makers a scientifically sound and quantitative tool for environmental assessment of transportation projects.

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Controlled Composite Action (C2A) Connectors: Proof of Concept

The challenge to minimizing or eliminating deck cracking is the contradiction between the flexibility needed to accommodate shrinkage strains and the stiffness/bonding required to provide full composite action. It is possible to achieve both of these contradicting goals through the use of controlled composite action (C2A) connectors for the deck-girder system. The innovative design mechanism controls composite action by preventing it during early ages (i.e., to allow for unrestraint crack free concrete shrinkage) while it is activated for higher service load and under ultimate loading condition. To achieve this objective (i.e., no composite action initially and full composite action ultimately) it is proposed that the shear connectors be wrapped in a hyper-elastic (rubber like) material of carefully designed thickness. Under low level of stresses the hyper-elastic material does not provide any resistance and deforms easily allowing for unrestraint shrinkage of concrete deck. Subsequent to initial straining due to shrinkage, the hyper-elastic material will develop high level of resistance and will fully engage the shear studs, thus, providing full composite action.

Tens of thousands of bridges in the US develop transverse deck cracking due to concrete shrinkage. Transverse cracks are observed on various types of superstructures and in most geographical locations. They increase the maintenance cost, reduce bridge life span through acceleration in reinforcement corrosion, and due to leakage of water through superstructure damage bridge substructure and affect bridge aesthetics. Thus, the life-cycle design feature of the proposed concept will have significant impact on durability and maintenance of highway bridges with enormous cost saving benefits with practically no initial cost.

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Understanding Residential Location Decision in the New York

This study will develop a theoretically sound and empirically tested residential relocation model, called MGEV model. Compared to existing models, the proposed model has four unique features. First, the model must recognize a wide variety of factors that come into people's housing decisions, for example accessibility to activities and closeness to one's social networks, for example. Second, the model realizes that there is a psychological threshold value associated with the current location.

The value of this psychological threshold may vary by households with unique characteristics. Understanding this threshold value is critical for a MPO agency to keep up with this recent movement of land use reforms. Third, the model must acknowledge the role that the current location plays in residential selection process, by allowing correlation between the current location and other alternative ones. Last, the developed model models two sequentially connected decisions together: a mobility decision (whether to move) and a residential relocation decision (where to move).

In order to test the model, this study also proposes an empirical data collection on households' residential relocation choices in New York City. A sample of 500 households in the area will be sampled via mail-out and mail-back questionnaires. A variety of potential factors that influence the relocation choice will be examined, including socio-economic and demographic factors, land use variables, attitudinal information, and social network related variables etc.

Though the collected sample size is relatively small, the proposed study will form an important theoretical and practical basis the next generation of New York Metropolitan Area's Best Practice Model, as it prepares itself to incorporate a crucial land use component. In addition, the results of the proposed project will provide important policy insights on the effectiveness of the newest movement across the country today, which is density-driven and mixed-used neighborhoods.

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UTRC Faculty Development Minigrants

The University Transportation Research Center wants to stimulate innovative and imaginative research by junior faculty in new and emerging areas related to transportation. The UTRC fund untenured faculty members in the development of a research working paper in their area of interest. The topic of the paper can involve any area of transportation including engineering, policy, economics, planning, travel behavior, sociology, management, law, and technology. In 2008 six faculty were awarded a grant under this program.



Research Paper Title	Faculty	Institution
Reidentifying Race and Technology: Streetcars in Nineteenth Century Philadelphia	Dr. Geoffrey D. Zylstra	New York City College of Technology
Stochastic System Optimum and Its Applications	Dr. Fan Yang	The City College of New York
Designing an automatic real-time traffic data-to-vehicle emissions system based on video vehicle detection data	Dr. Ke Max Zhang	Cornell University
Dynamic Analysis of Subway Structures under Blast Loading	Dr. Huabei Liu	The City College of New York
Assessing the Usefulness of Transportation Index in the New York Metro Area	Dr. George Wang	The College of Staten Island
Multimodal Transportation Safety	Dr. Greg Chen	Baruch College

UTRC's Newsletter & Website

UTRC's Newsletter, Research News is published semiannually and provides information to transportation professionals about research, education, and outreach activities in Region 2. Research News is available online.

The University Transportation Research Center Region 2 maintains a Website at <http://www.utrc2.org> which contains a comprehensive overview of the center's objectives, purposes and functions for planning and management of regional transportation systems.

The Website serves as an information tool for those transportation agencies that are interested in the Center's Research activities and as a bulletin board for students who are interested in pursuing transportation research studies toward advanced degrees.

The Website is a focal point for updated information presented in an accessible format which is visually pleasing and logically navigable.

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New RFPs [full list]

- Recycled Concrete Aggregate in Portland Cement Concrete (1/23/09)
- NY/NJ Port Risk Analysis (1/23/09)
- Correlation between Multiple Stress Creep Recovery (MSCR) Results and Polymer Modification of Binder (1/23/09)
- Modeling Mechanistic Properties of Unbound Pavement Materials for NYS (2/16/09)

Our Director Testimonies

Dr. Robert Paaswell, Director of UTRC testified to the Ravitch Commission on MTA Finance on Sep. 15, 2008 and to the New York State Commission on State Asset Maximization on Nov. 6, 2008. Both testimonies are available here: [Testimony to the Ravitch Commission](#) , and [Testimony to the State Asset Maximization Commission](#) .

Upcoming Events [full list]

- No upcoming events available.

AITE Graduate Scholarships

Sept. 11th Memorial Program

Employment Opportunities

USDOT/RITA National UTC Program

Annual Report

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Our Consortium

UTRC Webmail



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