



# Research News

Winter 2008

## Region 2 University Transportation Research Center

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### Director's Letter

The intensity of discussion in New York City and New Jersey about profound transportation changes has underscored the research community's concern over reliable data. In New York City, the Traffic Congestion Mitigation Commission has recommended strategies to relieve congestion – up to 6.8% - in Manhattan. These include a mild form of congestion charging. In New Jersey, the Governor in an attempt to both get the State budget back in balance and renew the State Transportation Fund has proposed major periodic increases in tolls on the NJ toll roads. What we hear from residents of each is the pain these measures would create. What we don't hear is any analysis of the actual benefits they will experience based on current well constructed travel behavior surveys. In NYC, the most recent data are over a decade old. And we know there have been regional shifts in attitudes towards modes of travel post-9/11. We also know that the regional population has shifted; there has been a major influx of immigrants, there have been major household shifts related to the expansive (and expensive) housing market. We also know that gasoline is at record – and climbing – prices, transit is at capacity, and trucks are an increasing sight on the transportation landscape. So – how would a worker, a commuter, a truck driver respond to price changes? What are the alternatives that travelers face or will face – including relocating home or place of employment. We need a new robust data set, using state of the art and well tested survey techniques as well as analysis of population demographics and economics using multivariate techniques – remember, transportation, land use and traveler characteristics are not three independent dimensions. We, in the research community are eager to see the new surveys being developed by NYMTC and its member agencies, and are just as eager to cooperate in the design and analysis of them. We need 21st Century data for 21st Century problems.

**Robert E. Paaswell P.E. Ph.D**  
**Distinguished Professor of Civil Engineering**  
**Director, UTRC**

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### **Quality Data, Quality Research: Improvements on NYMTC Data Products**

As in any other science- or engineering-based field, the availability, utility, and quality of data is a prerequisite to properly addressing the wide range of research questions, management challenges, and forecasting needs we face in the transportation field. From policy planning to performance evaluation, from model development to impact studies, good quality data is essential to generate ideas and clear-cut solutions to be implemented by transportation professionals and decision makers.

To improve data quality and utility within a continuous quality assessment and management framework, research organizations and agencies constantly look for the latest methodologies and technological tools for data management. In recognition of this need, the New York Metropolitan Transportation Council (NYMTC) recently awarded an 18-month project titled, "Improvements on NYMTC Data Products" to UTRC Consortium faculty Dr. Kaan Ozbay (Rutgers), Dr. Dilruba Ozmen-Ertekin (Hofstra), and Dr. Cynthia Chen (City College). The project will seek to modernize the Council's existing data products and improve their value to its member agencies and the public. It will address issues related to the timeliness of data, automation of access through web-based databases, and integration of data from different sources and formats, among other concerns. It will also focus on identifying specific issues and problems relating to the intrinsic, contextual, accessibility, and representational dimensions of data quality. The analysis will suggest appropriate solutions for any issues identified in these dimensions, while taking into consideration the latest technological tools, results of NYMTC's stakeholder survey, and best practices. The project will propose a data quality framework with protocols for ensuring the quality of information over its complete "lifecycle," including its creation, distribution, access, updating, and retirement.

These dynamic procedures, which might potentially be applied on a regular basis (bi-annually or whenever a new data is produced and needs to be disseminated) will consist of a generalized guideline that will allow the NYMTC personnel to decide how to create and disseminate a certain data product; tools to allow monitoring and assessment of the overall effectiveness of the data products; and a feedback mechanism to further improve the guidelines in the light of the results from periodic assessments.

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### **Universities Partner with RPA for Two Innovative Projects**

UTRC has long worked to develop partnerships between the region's universities and the public sector. Our new strategic plan includes a continuing commitment "to break down barriers to research, cooperation, and innovation in the transportation field, by fostering partnerships across intellectual fields, across academic institutions, and across the university-government-private sector divides." In 2008, UTRC will further this tradition by launching two innovative projects in partnership with the Regional Plan Association.

### ***Transportation and Land Use Visioning on Long Island***

The first project, "Long Island 2035: Building Public Consensus around a Sustainable Future," is sponsored by the New York Metropolitan Transportation Council and the New York State Department of Transportation. The project will play a supporting role to the Long Island Sustainability Plan, being lead by the Long Island Regional Planning Board (LIRPB) in close consultation with Nassau and Suffolk counties as well as local governments. Under the UTRC umbrella, the project team has two halves. On the academic side, it includes William Solecki (Hunter College), Robert Paaswell and Ellen Thorson (UTRC/City College), Sachi Dastidar (SUNY Old Westbury), and Ruth Brandwein and Howard Schneider (Stony Brook University). On the civic side, it will include Christopher Jones, Robert Yaro, Tom Wright, Robert Lane, Robert Pirani, Jeff Zupan, Robert Freudenberg, and Jennifer Cox (RPA), as well as participants from Vision Long Island and Sustainable Long Island. Project managers on behalf of UTRC are Christopher Jones (RPA) and Harry Schwartz (Senior Fellow with the CUNY Institute for Urban Systems). The Project Manager for NYMTC will be Gerry Bogacz, and the LIRPB and other entities involved in the Long Island Sustainability Plan will provide additional guidance and oversight.

The LI2035 project brings together for the first time efforts by both civic groups and governments to develop a broad, regional, consensus for how Long Island should develop – efforts that had previously been taking place on separate tracks. UTRC's scope of work includes identifying and building consensus around guiding principles for development in Long Island, designing a public education strategy, completing baseline analysis and projections of possible land use futures, and conducting at least one visioning workshop for the public. Some expected outcomes are for the work to become a major component of the Long Island Sustainability Plan; help align land use decisions with transportation investments; and help advance the state-of-practice land use modeling and visioning techniques. Overall, through a complex process of bringing key entities together, it is hoped that this project will contribute significantly in fostering regional cooperation on growth and land use priorities in Long Island as well as stronger cross-sectoral working relationships among the region's universities, civic groups, and governments.

### ***Maximizing Transportation Benefits Along the I-278 Corridor***

The other project, "Study of Goods Movement through the Interstate-278 Corridor," was authorized in the latest Federal transportation bill at the request of Representative Jerrold Nadler, and will examine freight infrastructure needs and freight-oriented economic development opportunities in the corridor stretching from Staten Island to the Bronx. The I-278 Corridor includes highway segments that have long been planned and managed discretely, rather than as a coherent system: the Staten Island Expressway, the Gowanus Expressway, and the Brooklyn Queens Expressway. It also includes the proposed Cross Harbor Rail Freight Tunnel and the under-developed rail freight infrastructure on the East side of the Hudson. The project will seek to complement the cross-

harbor rail freight alternatives analysis being led by the Port Authority by examining what additional policies and infrastructure are needed to maximize the benefits of a rail tunnel if it is built. It will include extensive outreach to the many agencies involved with different aspects of this complex system to seek new ways to achieve environmental and economic gains for the region.

The project team includes José Holguín-Veras and Satish Ukkusuri (RPI); Fan Yang (City College); Robert Paaswell, Herbert Levinson, and Ellen Thorson (UTRC); and Richard Barone, Chris Jones, and Jeff Zupan (Regional Plan Association). Managing the project on behalf of UTRC will be Benjamin Miller, Senior Fellow at the CUNY Institute for Urban Systems.

For more information, please visit UTRC's website at [www.utrc2.org](http://www.utrc2.org)

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## Research Grants News

### **2008 Mini-Grant Program**

UTRC provides mini-grants of \$5,000 to untenured Assistant and Associate Professors to stimulate innovative and imaginative research and publications in new and emerging transportation fields. We are pleased to announce that mini-grant recipients for 2008 are as follows:

**An Epidemiological Approach to Multimodal Transportation Safety** Greg Chen , Associate Professor of Public Affairs, Baruch College/CUNY (with Michael Bartron, Al Logie, and Maxine Lubner)

The proposed study would use an epidemiological approach to examine possible predictors of and current interventions for safety in aviation, highway and marine modes of transportation in two regions with widely different safety records: New York and Tanzania. The research will examine predictors of safety, with an understanding of how each region's problems and successes can inform the others.

**Dynamic Analysis of Subway Structures Under Blast Loading** Huabei Liu, Assistant Professor of Civil Engineering, City College of New York/CUNY

Though the threat of terrorism includes the threat to subway structures due to bombing blasts, there is a scarcity of work evaluating the structure integrity of existing subways and the guidelines for the design of new underground structures to minimize the effects of internal blast loading. The topic is timely and vital due to the potential for significant damage and loss of life. In this paper, Professor Liu will propose to develop a reliable method to perform this evaluation.

**Assessing the Usefulness of a Regional Transportation Services Index** George Wang, Assistant Professor of Finance, College of Staten Island/CUNY

Leading indicators of changes in the business cycle can assist governments

and the private sector with decision-making. However, the indicators currently available focus primarily on the manufacturing industry and under-represent the service sector. Lahiri et al. have developed a Transportation Services Index to fill this void for the transportation industry nationally. But there is no comparable indicator in the New York Metropolitan region, where the transportation sector and the general economy have a particularly critical relationship. Dr. Wang proposes to assess the applicability of the Lahiri Index to the New York metro area, and identify the metrics, data, and methodologies needed for developing a New York Metropolitan Area Index.

**Stochastic System Optimum and Its Applications** Fan Yang, Assistant Professor of Civil Engineering, City College of New York/CUNY

There is an ongoing need in the New York Metropolitan Area for computational strategies that can help estimate how travelers will respond to changes in transportation network capacity and road pricing and tolling policies. This paper will propose a more realistic, iterative, stochastic approach to making these difficult forecasts.

**Designing an Automatic Real-Time Traffic Data-to-Vehicle Emissions System Based on Video Vehicle Detection Data** Ke Max Zhang, Assistant Professor of Mechanical and Aerospace Engineering, Cornell University

Intelligent transportation systems (ITS) have been gradually implemented to reduce congestion, improve traffic flow, promote transportation safety and enable people to make smart travel choices. This project will develop an integrated vehicle-video detection system to quantify time-resolved vehicle emissions from the real-time data generated from commercially available video vehicle detection units. The intersection of Highways I-81 and 690 in downtown Syracuse will be used as a test bed.

**Re-Identifying Race and Technology: Streetcars in Nineteenth Century Philadelphia** Geoffrey D. Zylstra, Assistant Professor of History, NYC College of Technology/CUNY

This paper will make two scholarly contributions based on a review of the streetcar system in Philadelphia in the 1860s when the streetcar system became a focal point in the reorganization of race relations as whites tried to define the new transportation system as a symbol of racial superiority and excluded black people from riding in the cars. The analysis will connect race and technology and explain that when cities undergo technological transformations, as Philadelphia did in the nineteenth century when it industrialized, groups of people have opportunities to reinvent their identities via new technologies and reposition themselves socially. This point is germane to many US cities today that are shedding identities as industrial cities and reinventing themselves as service oriented cities.

### ***Other Recent Research Grants***

The following is a list of new projects awarded since the last edition of this newsletter. In the interest of increasing awareness of research underway regionwide, we are including projects being conducted both inside and outside the UTRC consortium.

**Automated Pedestrian Counter** (awarded by NJDOT to Kaan Ozbay, Rutgers Univ.)\*

**Crosswalk Demonstration Project: Design & Evaluation of Effective Crosswalk Illumination** (awarded by NJDOT to John D. Bullough and Mark S. Rea, Rensselaer Polytechnic Institute)

**Customer Behavior Relative to Gap Between Platform and Train** (awarded by NJDOT to Janice R. Daniel, NJIT)\*

**Development of Falling Weight Deflectometer Procedures Manual** (awarded by NJDOT to Nenad Gucunski, Rutgers Univ.)\*

**Diesel Retrofit Assessment** (awarded by NYSDOT to Oliver Gao, Cornell Univ.)

**Energy Savings/Cogeneration Plant** (awarded by NJDOT to Frank A. Felder, Rutgers Univ.)\*

**Evaluation of the Automated Distress Survey Equipment** (awarded by NJDOT to Ali Maher, Rutgers Univ.)\*

**Heavy Metal Contamination in Highway Marking Beads** (awarded by NJDOT to Kauser Jahan, Rowan Univ.)\*

**Impact of Demographic Changes on Transit Patterns in New Jersey** (awarded by NJDOT to Dan Chatman, Marc Weiner, Jon Carnegie, Rutgers Univ.)\*

**New Jersey Motorcycle Fatality Rates** (awarded by NJDOT to Yusuf Mehta, Rowan Univ.)\*

**Non-Contact Skid Resistance Measurement** (awarded by NJDOT to Jay N. Meegoda and Geoff Rowe, NJIT)\*

**Transportation Impact on the Economy** (awarded by NJDOT to Joseph J. Seneca, Kaan Ozbay, and Jon Carnegie, Rutgers Univ.)\*

**Warm Pavement Technology** (awarded by NJDOT to Thomas Bennert, Rutgers Univ.)\*

\* Not funded through the UTRC Consortium

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### **Best Paper Competition**

The winner of the 2007 UTRC Best Paper Competition was “An Investigation on the Effectiveness of Joint Receiver-Carrier Policies to Increase Truck Traffic in the Off-peak Hours.” The lead author was José Holguín-Veras, Professor and newly-appointed Interim Department Head of Civil and Environmental Engineering at Rensselaer Polytechnic Institute. His co-authors were Michael Silas, John Polimeni, and Brenda Cruz. Professor Holguín-Veras and the paper were honored at the 2008 Annual Leadership in Transportation Awards Ceremony sponsored by the NYU Wagner Rudin Center for Transportation Policy and Management on February 7th. The two-part paper was published in the journal *Networks and Spatial Economics* last year.



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### **Student of the Year Award**



Benjamin Reim, the 2007 Student of the Year from UTRC, lived and grew up in Palmer, Massachusetts. He attended Rensselaer Polytechnic Institute to study engineering. From 2001 to 2003, he was unsure on the field of engineering he wished to pursue, however a meeting with his advisor sparked an interest in transportation engineering. In the remaining two years of his Bachelor's program, he participated in two summer internships with Massachusetts Highway Department and Whiting Turner Contractors. 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. Holguín-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 and also finishing up work with Prof. Holguin-Veras on an extension of his graduate research. 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.

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### **Upcoming Seminar: Yoram Shiftan on Activity Based Modeling**

Yoram Shiftan, Professor of Civil and Environmental Engineering at The Technion in Israel, will talk at the next NYMTC Brown Bag Lunch on the topic, A Practical Policy Sensitive Activity-Based Model, on March 25, 2008, 12:00-1:00 PM. 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. This talk will describe 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 will show 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 will also be discussed. Dr. Shiftan specializes in areas of travel behavior, demand modeling, transportation economics and transportation and air quality. Prior to joining the Technion, Dr. Shiftan was a Senior Associate at Cambridge Systematics Inc. in Cambridge, Massachusetts, where he led major transportation projects across the U.S. Dr. Shiftan is currently on sabbatical at Taubman College of Architecture and Urban Planning at University of Michigan.

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### **UTRC Advances Best Practices in Household Travel Surveys**

As the New York Metropolitan Transportation Council prepares to launch its first regional household travel survey in over a decade, UTRC has been working closely with the Council to assist with its planning efforts.

Recently, UTRC staff organized a workshop at NYMTC's request on "Contemporary Issues in Household Travel Behavior Survey Design and Management: Best Practices and Pitfalls to Avoid." This event, held at NYMTC on January 9-10, 2008, featured survey and model managers from MPOs around the nation, as well as other leading experts on survey design and implementation. Speakers included:

- Cynthia Chen (City College)
- Hongmian Gong (Hunter College)
- Robert Griffiths (Metropolitan Washington Council of Governments)
- José Holguín-Veras (Rensselaer Polytechnic Institute)
- Neil Kilgren (Puget Sound Regional Council)
- Kyung-Hwa Kim (Portland Metro)
- Elaine Murakami (Federal Highway Administration)
- Laxmi Ramasubramanian (Hunter College)
- Guy Rousseau (Atlanta Regional Commission)

The presentations addressed a wide range of issues, including improving survey response rates, sampling techniques for hard-to-reach populations, applications of GPS technologies in household travel surveys, and benefits of panel surveys and stated preference questions. The workshop was attended by over 30 staff members of NYMTC and its member agencies, and provided a



rare opportunity to question experts and colleagues from around the country who have recently been through the process of travel survey design and implementation. [Presentations from this workshop are available at the UTRC website.](#)

Previously, Prof. Catherine T. Lawson of the University at Albany helped NYMTC begin thinking about its new survey by conducting a review of the 1996-1997 Regional Travel Household Interview Survey. Her report distilled some lessons learned from this previous survey effort, and summarized best and emerging practices in household survey design as reported at a recent international conference on the topic. [It is available at the UTRC website.](#)

For more information, please visit UTRC's website at [www.utrc2.org](http://www.utrc2.org)

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



Dr. Han S. Mahmassani, William A. Patterson Distinguished Chair in Transportation, Northwestern University, delivered a UTRC Visiting Scholar Seminar on February 22 on Predictive Strategies for Real-Time Pricing, Information and Traffic/Access Control. He 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.

Video and the presentation from this event are available at the [UTRC website.](#)

For more information, please visit UTRC's website at [www.utrc2.org](http://www.utrc2.org)

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### **Region II Universities at TRB 2008**

Faculty, staff, and students from Region II universities attended the 2008 TRB annual meeting in force this past January. Below is a list of presentations,

panels, and poster sessions by academic researchers in the region.

Bekir Bartin and Kaan Ozbay (Rutgers), **Comparison of Tolls with Estimated Full Marginal Costs: Theory Meets Reality**

Thomas A. Bennert (Rutgers), and Jean-Valery Martin (Innophos, Inc.), **Polyphosphoric Acid in Combination with Styrene-Butadiene-Styrene Block Copolymer: Laboratory Mixture Evaluation**

Thomas A. Bennert and Ali Maher (Rutgers), **Field and Laboratory Evaluation of a Reflective Crack Interlayer in New Jersey**

Maria Boilé, Sotiris Theofanis, Alok Baveja and Neha Mittal (Rutgers), **Regional Repositioning of Empty Containers: Case for Inland Depots**

Maria Boilé, Sotirios Theofanis (Rutgers), Christine Mastrogiannidou and Athanasios Ziliaskopoulos (Univ. of Thessaly), **Intraterminal Transport Problem: System Description, Literature Review, and Research Recommendations**

Ralph Buehler and Nora Lovrien (Rutgers), **Using National Travel Data in State Energy Master Planning: Gaps and Opportunities in National Transportation Data**

John D. Bullough, Jean Paul Freyssinier and Mark S. Rea (RPI), **Implementing Semipermanent High-Mast Lighting for Highway Construction Projects**

Stephanie Camay, Laxmi Ramasubramanian, Brandon Derman, Eric Bohn, Jochen Albrecht, William Milczarski (Hunter College/CUNY), Maria Boilé and Sotiris Theofanis (Rutgers), **Ferry Parking and Landside Access Study: Implementing Public Outreach and Impact Assessment**

Daniel G. Chatman (Rutgers), **Deconstructing Development Density: Quality, Quantity, and Price Effects on Household Nonwork Travel**

Daniel G. Chatman (Rutgers), **Residential Self-Selection and Nonwork travel: Evidence Using New Data and Methods**

Robert Checchio (Rutgers), **Impact of Noncommercial Airports on Regional Economic Growth**

Cynthia Chen (City College/CUNY), presided at session on **Dynamics of Travel Behavior**

Jason Chen, Cynthia Chen (City College/CUNY), and Harry J .P. Timmermans (Eindhoven Univ. of Technology), **Accessibility Trade-offs in Households: Residential Relocation Decisions**

Stuart S. Chen (Univ. of Buffalo/SUNY), **Three-Dimensional Modeling**

**Application for Bridge Fabrication, Construction, and Beyond**

Lili Du, Satish V. Ukkusuri, and ShivKumar Kalyanaraman (RPI), **Characterizing Interference in Vehicle Ad Hoc Network on Freeway Segment Under Various Traffic Flow Conditions**

Jean Paul Freyssinier, John D. Bullough and Mark S. Rea (RPI), **Performance Evaluation of Semipermanent High-Mast Lighting for Highway Construction Projects**

Thomas Furlani (Univ. of Buffalo/SUNY), **Visualization in Transportation Planning**

H. Oliver Gao and Ameya Bapat (Cornell), **Diesel Particulate Matter Number Emissions: Evaluation of Existing Modal Emission Modeling Approaches**

Mihalis Golias, Sotiris Theofanis, Maria Boilé (Rutgers), and Heidi A Taboada (Univ. of Texas at El Paso), **Post-Pareto Analysis Approach for Discrete and Dynamic Multiobjective Berth Allocation Problem**

Cameron Gordon (Univ. of Canberra), **Risk Allocation - What It Is and Its Importance in Assessing Equity for Major Project Investments**

Nenad Gucunski, Ali Maher, Thomas Bennert (Rutgers), Greg Slaubaugh, Zhe Wang and Tong Fang (Siemens), **Visualization and Interpretation of Impact Echo Data from Bridge Deck Testing**

Daniel Baldwin Hess (Univ. of Buffalo/SUNY), **Access to Public Transit for Older Adults in Buffalo, New York, and in San Jose, California**

José Holguín-Veras (RPI), **Necessary Conditions for Off-Hour Deliveries and Effectiveness of Urban Freight Road Pricing and Alternative Financial Policies in Competitive Markets**

José Holguín-Veras and Matthew Bromm (RPI), **Trucking Costs: Comparison Between Econometric Estimation and Cost Accounting**

José Holguín-Veras, Miguel Jaller Martelo, Satish V. Ukkusuri, Matthew Bromm, Coral Torres (RPI), Tricia Wachtendorf and Bethany Brown (Univ. of Delaware), **Analysis of Temporal Distribution of Requests for Critical Supplies After Hurricane Katrina**

Lynne H. Irwin and David Paul Orr (Cornell), **Fundamentals of Pavement Deflection Analysis: Methods for Backcalculation with Application to Mechanistic Pavement Design**

Catherine T. Lawson (Univ. at Albany/SUNY), and Roberta Weisbrod (Partnership for Sustainable Ports), **Freight Ferries: Factors for Success**

George C. Lee(Univ. of Buffalo/SUNY), **Innovative Technologies and Their Application to Enhance Seismic Performance of Highway Bridges**

Jung-Beom Lee and Kaan Ozbay (Rutgers), **Calibration of a Macroscopic Traffic Simulation Model Using Enhanced Simultaneous Perturbation Stochastic Approximation Methodology**

Herbert S. Levinson (UTRC), **Rail Shuttles: Concepts and Case Studies**

Herbert S. Levinson (UTRC), **Street-Running Bus Rapid Transit and Light-Rail Transit Operations**

Herbert S. Levinson (UTRC), Kelly Blume, Alan Danaher (Kittelson & Associates), and Samuel L. Zimmerman (World Bank), **Bus Rapid Transit: Assessing Costs and Effects style**

Herbert S. Levinson (UTRC), Jerome Steven Gluck (Urbitran Associates), Janet M. Barlow (Accessible Design for the Blind), Ronald W. Eck (West Virginia Univ.), and William F. Hecker (Hecker Design), **Driveway Design Practices: Overview**

Rongfang Liu (NJIT), **Automated People Mover Connections in Beijing, China**

Rongfang Liu (NJIT), and Changqian Guan (U.S. Merchant Marine Acad.), **Container Volume and Truck Trip Generations at Marine Container Terminals: Behavioral Analysis**

Rongfang Liu (NJIT), and Yi Deng (Parsons Transportation Group), **Developing Statewide Weekend Travel Demand Forecast and Mode Choice Models for New Jersey**

Ayaz H. Malik (RPI), presided at session on **Seismic Retrofitting of Long- and Multispan Bridges**

Jay N. Meegoda, Thomas M. Juliano, and Sameer Wadhawan (NJIT), **Estimation of the Remaining Service Life of Culverts**

Yusuf A. Mehta, Jeffrey Owad (Rowan), Robert W. Sauber (NJDOT), and Jared Krause (Everland Shourds Assoc.), **Lessons Learned During Implementation of Mechanistic-Empirical Pavement Design Guide**

Sandeep Mudigonda, Kaan Ozbay (Rutgers), and Harsh P. Doshi (Schoor DePalma), **GIS-Based Decision Support Tool for Evaluation and Selection of Adaptive Traffic Control Strategies on Transportation Networks**

Hani Nassif, Kagan Aktas, Husam Najm (Rutgers), and Nakin Suksawang (Florida Int'l Univ.), **Assessment of Cracking Potential in High-Performance Concrete Under Restrained Conditions**

Hani H. Nassif, Kaan Ozbay (Rutgers), Ali Oguz Ertekin (Parsons Transportation Group), **Life-Cycle Cost Analysis Algorithm for Bridges: Comprehensive Approach**

David Paul Orr (Cornell) presided at session on **Characterization of Detrimental Effects of Moisture and Frost on Pavements**

Kaan Ozbay and Eren Erman Ozguven (Rutgers), **Nonparametric Bayesian Estimation of Freeway Capacity Distribution from Censored Observations**

Kaan Ozbay, Hong Yang, Bekir Bartin, Sandeep Mudigonda (Rutgers), **Derivation and Validation of New Simulation-Based Surrogate Safety Measure**

Eren Erman Ozguven and Kaan Ozbay (Rutgers), **Performance Evaluation of Simultaneous Perturbation Stochastic Approximation Algorithm for Solving Stochastic Transportation Network Analysis Problems**

Dilruba Ozmen-Ertekin (Hofstra), Kaan Ozbay, Sandeep Mudigonda (Rutgers), and Anne Cochran (Urban Engineers, Inc.), **A Simple Approach to Estimating Changes in Toll Plaza Delays**

Jonathan Peters (College of Staten Island/CUNY), and Cameron Gordon (Univ. of Canberra), **Results Not Guaranteed: Road Pricing in New York and London**

John Pucher and Ralph Buehler (Rutgers), **Cycling for Everyone: Lessons from Europe**

Gitakrishnan Ramadurai, Satish V. Ukkusuri, Jinye Zhao and Jong-Shi Pang (RPI), **Dynamic Equilibrium in Multiuser Class Single-Bottleneck Models: Complementarity Formulation**

Laxmi Ramasubramanian (Hunter College/CUNY), and Jennifer L. Weeks (Parsons Brinckerhoff), **Evaluating Effectiveness of Widely Available Three-Dimensional Visualization Tools in Support of Public Participation**

Martin Robins (Rutgers), **Northeast Corridor Action Plan: Call for New Federal-State Partnership**

Jakub Rowinski, Keir Opie, and Lazar N. Spasovic (NJIT), **Development Of Method to Disaggregate 2002 FAF2 Data Down to County Level for New Jersey**

Kelvin R. Santiago-Chaparro, Benjamín Colucci-Rios and Alberto M. Figueroa Medina (Univ. of Puerto Rico, Mayaguez), **Development and Evaluation of a Software Tool that Integrates GPS and Video Data from a Road Alignment to Perform Road Condition, Safety Audits and Inventory Surveys**

Darrell B. Sonntag and H. Oliver Gao (Cornell), **Evaluation of Driving Schedule Methodology in EPA's MOVES**

Darrell B. Sonntag, H. Oliver Gao (Cornell), and Britt Holmen (Univ. of Vermont), **Variability of Particle Number Emissions from Conventional and Hybrid Diesel-Electric Buses in Real Driving Conditions**

Feng-Ming Tsai, I. Jy Chien and Lazar N. Spasovic (NJIT), **Optimizing Distance-Based Fares and Headway of an Intercity Transportation System with Elastic Demand and Trip Length Differentiation**

Satish V. Ukkusuri (RPI), and Pamela Murray-Tuite (Virginia Polytechnic Inst.), **Challenges in Modeling Transportation Network Vulnerability**

Satish V. Ukkusuri (RPI), S. Travis Waller, Kara Kockelman (Univ. of Texas, Austin), and Ampol Karoonsoontawong (Maricopa Assoc. of Govts.), **Simulation-Based Heuristic Approach for Dynamic Marginal Cost Pricing**

Satish V. Ukkusuri (RPI), and Gopal R. Patil (Univ. of Vermont), **Sample Average Approximate Method for Flexible Network Design Problem**

Thomas H. Wakeman (Stevens), **Developing a Course of Action for Ameliorating Air Emissions Associated with the Import Supply Chain**

Thomas H. Wakeman (Stevens), **Why Are Ports Incapable of Solving Problems with International Freight Growth on Their Own?**

Qian Wang and José Holguín-Veras (RPI), **An Investigation on the Attributes Determining Trip Chaining Behavior in Hybrid Micro-Simulation Urban Freight Models**

Trefor P. Williams (Rutgers), **Using Information Technologies to Support Better Construction Management** James J. Winebrake, Aaron Falzarano, Scott Hawker, Karl Korfmacher, Steve Zilora, Sai Ketha (Rochester Inst. of Tech.), and James J. Corbett (Univ. of Delaware), **Minimizing Energy and Environmental Impacts of Intermodal Freight Transport: Development and Application of a Geospatial Routing Tool**

Fan Yang (City College/CUNY), **Day-to-Day Dynamic Optimal Tolls with Elastic Demand**

Fan Yang (City College/CUNY), Chanyoung Lee (Univ. of South Florida), Bin Ran (Univ. of Wisconsin), and John Shaw (Wisconsin DOT), **Analysis of Alternate Route Choice Behavior with Variable Message Signs using Hybrid Tree Method**

Ozlem Yanmaz-Tuzel, Kaan Ozbay, Sandeep Mudigonda and Bekir Bartin (Rutgers), **Quantification of Possible Impacts of Capacity Expansion Projects on Transportation Costs via Trip-Based Full Marginal Cost**

## **Estimation Methodology**

Wilfredo F. Yushimito, and Satish V. Ukkusuri (RPI), **Location-Routing Approach for Humanitarian Prepositioning Problem**

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## **Protecting New York from Terrorism and Disaster**

A conference organized by Protect New York on safeguarding New York from terrorism and disaster was held on January 10-11, 2008 at the Levin Institute of the State University of New York. Ernest Sternberg, Professor of Urban & Regional Planning at the University at Buffalo, is president of Protect New York, and UTRC was one of the conference co-sponsors. Many topics of direct and indirect transportation interest were presented at the conference. A panel on transportation security was convened by Daniel B. Hess, Assistant Professor of Urban and Regional Planning at the University at Buffalo, and a panel on emergency logistics was convened by José Holguín-Veras, Professor of Civil Engineering at the Rensselaer Polytechnic Institute. Here is a sampling of the presentations:

James Ercolano (NYSDOT), **Pedestrian Disaster Preparedness and Emergency Management of Mass Evacuations on Foot: State-of-the-Art, and Best Practices**

Norman Groner and Robert Till (John Jay College of Criminal Justice/CUNY), **Designing Complex Subway Emergency Response Systems Using Desirable Systems States**

José Holguín-Veras, Noel Pérez, and Satish Ukkusuri (RPI); and Tricia Wachtendorf and Bethany Brown (University of Delaware), **Emergency Logistics Issues Impacting the Response to Katrina: A Synthesis and Preliminary Suggestions for Improvement**

José Holguín-Veras, Miguel Jaller, Satish Ukkusuri, Matthew Brom, and Coral Torres (RPI); and Tricia Wachtendorf and Bethany Brown (University of Delaware), **An analysis of the temporal distribution of requests for critical supplies after Hurricane Katrina**

Earl Rusty Lee (University of Delaware) and William Wallace (Rensselaer Polytechnic Institute), **Restoration of Services in Interdependent Infrastructure Systems**

Owen McShane, Director of Investigations, NYS Department of Motor Vehicles, and University at Albany, **The Impacts of Terrorism on Drivers License Issuance**

Harvey Molotch and Noah McClain (New York University), **The Promise and Pitfalls of Worker Vigilance in the Subway: Preliminary Findings**

Jennifer Richmond-Bryant (Hunter College/CUNY) and Ann E. Wittig (City College of New York/CUNY), **Transport and Dispersion of Threat Agents in a Scale Model of a Subway Station**

Zhigang Zhu (City College of New York/CUNY), **Fast Response in New York City: Real-time Airborne 3D and Motion Reconstruction for Security and Planning of Urban Transportation**

Rae Zimmerman and Jeffrey S. Simonoff (New York University), **Transportation Density and Opportunities for Expediting Recovery to Promote Security**

Rae Zimmerman and Carlos E. Restrepo (New York University), **Research Directions for Analytical Tools to Portray and Monitor Infrastructure Vulnerability for Resource Allocation**

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### **Notes And News**

**Daniel B. Hess**, Assistant Professor of Urban and Regional Planning at the University of Buffalo, has recently completed two research papers. The first, ***Influence of Proximity and Access on Transit Ridership for Older Adults***, explores associations between older adults who do and do not ride fixed-route public transit and their neighborhood walking access to buses and trains. The research tests whether or not the distance between a trip origin or destination and a transit stop or station is a significant factor in predicting frequency of transit ridership. Data from a survey of older adults in California and New York was used to regress older adults' frequency of riding public transit against explanatory variables, including demographic and socioeconomic variables, access and mobility measures, and neighborhood characteristics. Findings suggest that self-reported walking distance to transit has a statistically significant influence- in San José, California, but not in Buffalo, New York – in predicting transit ridership frequency and whether or not a survey respondent is a driver. Partial funding for the development of this paper was provided by the UTRC Faculty Development Minigrants program.

Prof. Hess' second paper, co-authored with Julie Gotham, is titled, **"Multi-Modal Mass Evacuation in Upstate New York: A Review of Disaster Plans"**. Following the devastating aftermath from Hurricane Katrina, this paper examines the case for evacuation planning in Upstate New York that considers the "carless" by paying special attention to the movement of people to safety using a combination of methods—by foot, public transit, coaches, and vans. Many Upstate New York places are ill prepared for the large-scale evacuation of the carless that may result from an extreme event. The share of households without vehicles in several Upstate cities— Albany (28 percent), Buffalo (31 percent), and Syracuse (27 percent)—surprisingly meets or exceeds the share in New Orleans when Hurricane Katrina struck. This study identifies strengths and weaknesses within upstate written disaster plans in regards to multi-modal evacuation. Findings suggest that many upstate places—except for those near nuclear power plants—have inadequate written plans for mass evacuation,



especially when considering the carless population. For more information see, Hess and Gotham (2007), "Multi-Modal Mass Evacuation in Upstate New York: A Review of Disaster Plans," *Journal of Homeland Security and Emergency Management*. Vol. 4 : Iss. 3, Article 11.

**Marina G. Figueiro, John D. Bullough, and Mark S. Rea** of RPI recently completed a working paper titled, "[Light Isn't Just for Vision Anymore: Implications for Transportation Safety.](#)" The paper, partially funded by a UTRC Faculty Development Minigrant, reviews how 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. It is well established that light can increase alertness at night or shift the timing of one's sleep to daytime hours instead of nighttime hours. The paper summarizes this research with the objective of providing a framework for integrating circadian photobiology into transportation lighting practice. The application of light for impacting the circadian system can be a non-pharmacological tool to increase alertness and possibly reduce sleep related accidents at night. A framework for future research needed to integrate knowledge of light's impact on nighttime alertness is also discussed.

**H. Oliver Gao and Timon Stasko** of Cornell University, recently completed a working paper titled, "[The Retrofit Puzzle: Optimal Fleet Owner Behavior in the Context of Diesel Retrofit Incentive Programs.](#)" Potential government regulations and financial incentives for encouraging pollution reduction retrofits on diesel vehicles are discussed in this paper. An integer program is developed to model profit-maximizing fleet owner behavior in the context of potential government programs. The model is intended as a tool both for fleet owners and for government administrators. It allows for mandated retrofits, mandated percent reductions of specified emissions, fixed grants for performing retrofits, and grants per gram of pollution prevented. It treats the fleet size and miles remaining for each vehicle as fixed and known at the time retrofits are made. Retrofits are all assumed to take place in the present, but benefits and costs are distributed over time. A case study is used to demonstrate how a sample fleet owner would respond to various incentives. Partial funding for the development of this paper was provided by the UTRC Faculty Development Minigrants program.

This semester, UTRC is pleased to welcome two Scholars in Residence at our offices.



**Rachel Weinberger** is an assistant professor in the Department of City and Regional Planning at the University of Pennsylvania . In 2006-2007 she served Mayor Bloomberg's administration as the transportation policy Senior Advisor for PlaNYC. Dr. Weinberger's work is focused on urban transportation system productivity and urban travel behavior. She will be a scholar in residence at UTRC for the spring '08 semester and through the summer. Better Understandings of Preference Formation for Auto Ownership; Job Quality and

Commute Behavior; X-treme Commuting and Housing/Neighborhood Amenities; and Efficient Allocations of Public Rights-Of-Way are among several of her current research projects.

**Miquel Estrada** is a Doctor in Civil Engineering at the UPC-Technical University of Catalonia (Spain). He has joined UTRC for 6 months. His topics of research are logistics and transportation terminals, and operations in public transportation. He has 2 years experience in the planning and management of railway projects and 5 years experience as an assistant professor in the Department of Transport and Territory Infrastructure at the UPC.



NYMTC's **Sept. 11th Memorial Program for Regional Transportation Planning Academic Initiative** promotes the academic and professional development of students by providing them with opportunities to participate in innovative research and planning projects, along with a stipend and tuition assistance. Applications are due April 4 2008. For complete information on eligibility and application instructions, [please see the UTRC website.](#)

For more information, please visit UTRC's website at [www.utrc2.org](http://www.utrc2.org)

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**CONSORTIUM MEMBERS** include the City University of New York, Columbia University, Cornell University, New Jersey Institute of Technology, New York University, Polytechnic University, Rensselaer Polytechnic Institute, Rowan University, Rutgers University, the State University of New York system, Stevens Institute of Technology, and the University of Puerto Rico.

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