



Research News

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UPCOMING EVENTS:

May 1, 2009 – Visiting Scholar Seminar: Prof. Randall Crane. Baruch College, NYC.

May 13, 2009 – Transaction 2009: 33rd Annual NJ State Transportation Conference and Expo

June 11, 2009 – 2009 ITS-NY 16th Annual Meeting: ITS and Sustainability

June 12, 2009 – Visiting Scholar Seminar: Prof. Daniel Sperling. Baruch College, NYC.

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Director's Letter

Region 2 is suffering the economic downturn along with the rest of the country. While bad economics are, in theory, good for university enrollments, the truth is that bad economic times are just that—bad! The critical indicator, employment, drives all else. The sectors that thrive off of the unique employment in New York City—the financial industry—have had an immediate and detrimental impact on real estate and other industries supporting the financial sector. Real estate taxes are used to support public transit, so New York City's critical infrastructure—its subways and busses—have come up way short at budget time. Whose responsibility is it to fund the shortfall? Is it the riders, those who benefit through access? Developers and commercial enterprises, those who drive cars and create congestion and pollution? Or is it all who live and work in the state and benefit by the economic activity that can only be generated by the very unique set of economic activities defined by the five boroughs and Manhattan in particular? Substantial numbers of households, as far away as Scranton, New Haven and Middletown, New York, are supported by jobs in the core. Supporting the MTA should be a simple exercise: all benefit, all should somehow share in keeping the system operating at a high level of service—one that befits a world class city. Providing 8 million plus trips a day is expensive; there are no magic cost saving bullets to bite. Both continuing capital support and continuing operating support is needed. To that end, UTRC will continue to provide technical support and analysis to our colleagues that work in support of the region's transportation systems.

2009 NYU Wagner Rudin Center Leadership in Transportation Awards

Robert Paaswell Receives Lifetime Achievement Award

Every year, the NYU Wagner School's Rudin Center for Transportation Policy & Management honors transportation leaders and regional agencies with their annual Leadership in Transportation Awards. The 2009 Awards Ceremony were held on February 24th at NYU's Rosenthal Pavilion. Robert E. Paaswell, UTRC Director and Distinguished Professor of Civil Engineering, City College of New York, received a Lifetime Achievement Award for his many contributions to the field of transportation. This is the first time a lifetime achievement award has been presented and it is very fitting that Professor Paaswell was the first recipient of this award.



Jeff Ban Receives Best Transportation Paper Award

The winner of the 2008 UTRC Best Transportation Paper Competition was "Bottleneck Identification and Calibration for Corridor Management Planning". The lead author was Xuegang (Jeff) Ban, an assistant professor of Civil and Environmental Engineering at Rensselaer Polytechnic Institute. His co-authors were Lianyu Chu and Hamed Benouar. Professor Ban and the paper were honored at the Awards Ceremony for their work on developing practical and efficient approaches for bottleneck identification and calibration in microsimulation.

Workshop on Safety and Behavior of Bridges Subjected to Blast in a Multi-Hazard Environment

The significance and urgency of developing guidelines for blast resistant design of bridges has become more prominent because of increased security risks to our infrastructure. The recent collapse of the I-35W Mississippi River bridge in Minnesota has demonstrated the risk of substantial casualties, economic disruptions and other societal ramifications. Analyzing and designing bridges to sustain blast load effects requires the use of specialized and complicated computational tools. This task is more complicated by the fact that bridge components must be designed to sustain different hazards, many of which have conflicting demands. Bridge owners and their staff should also be trained in analyzing and in understanding effects of blast on the structure in a multi-hazard environment.



With these objectives in focus, a workshop on safety and behavior of bridges subjected to blast in a multi-hazard environment was organized in New York City from February 18-19, 2009. The workshop, co-chaired by Professor Anil K. Agrawal of the City College of New York, Dr. Sreenivas Alampalli, Director of the Bridge Evaluation Services Bureau at the New York State Department of Transportation, and Dr. Mohammed Ettouney of Weidlinger Associates, was sponsored by the Region 2 University Transportation Research Center (UTRC), Federal Highway Administration, New Jersey Department of Transportation, New York State Department of Transportation and the City College of New York.

The workshop was attended by about 80 people, by invitation only, from state transportation agencies,

federal government, consultants, and researchers. The first day of the workshop began with an opening address by the director of UTRC, Dr. Robert Paaswell, followed by presentations from leading experts in the field on: (1) bridging the gap between state of knowledge and state of practice; (2) current status of blast analysis, design and detailing; (3) the role of multi-hazard design philosophy in blast mitigation; (4) design paradigm and emergence of performance-based design; (5) American Association of State Highway and Transportation Officials (AASHTO) and Federal Highway Administration (FHWA) perspectives and ongoing efforts related to bridge security; and (6) owners and consultants perspectives on bridge security initiatives and issues. Following each of these sessions, the participants engaged in extensive and vibrant discussions on issues raised by the presenters.

The second day of the workshop consisted of sixteen breakaway sessions and one general session. In the breakaway sessions, participants were divided into groups of bridge owners, federal stakeholders, researchers and consultants, and enforcement. Participants were provided with carefully designed questionnaires and discussion items for each of the breakaway sessions. The feedback provided by the workshop participants is being analyzed and will be reported in near future. Representative chairs of each of the breakaway sessions presented summaries of discussions during the breakaway sessions.

The general session of the second day of the workshop began with a presentation by Dr. Mary Ellen Hynes and Dr. John Fortune of the Department of Homeland Security. They presented various research initiatives taken by DHS towards improving the safety of our nation's bridges and other infrastructure. The workshop concluded after closing remarks by the workshop chair, Dr. Agrawal, acknowledging the support of sponsors and graduate students at the City College of New York.



Based on the feedback received, workshop co-chairs are preparing formal workshop proceedings that will be available in the near future. The proceedings will contain brief descriptions of the presentations, a summary of the feedback provided, recommendations for future work, and, if possible, a roadmap to achieve the goals identified at the workshop deliberations. These will be distributed to all Stakeholders including AASHTO, Department of Homeland Services (DHS), FHWA and others. A white paper will also be prepared and published in a suitable media for wide circulation. For more information, please contact Sreenivas Alampalli (salampalli@dot.state.ny.us), Dr. Anil Agrawal (anil@ce.ccny.cuny.edu), or Dr. Mohammed Ettouney (Ettouney@wai.com).

2009 Visiting Scholar Seminars



May 1st, 2009: Prof. Randall Crane, Director of the Institute of Transportation Studies at the UCLA School of Public Affairs

Professor Crane will be presenting "Sex Changes Everything: On the Demographic Determinants of the U.S. Commute, 1985-2007." The average U.S. male historically commutes further and longer than his female counterpart. Yet pivotal changes at home, as younger women especially increase their influence on household location and work decisions, and in the labor market, as women's participation rates and profiles approach men's, both strongly suggest that gender's influence on travel might be changing as well. Further, the independent and interactive influence of other demographic factors, not least age and race, remain unclear.

Professor Crane has analyzed national micro-data covering the past twenty years to examine both issues. The study found sources of both convergence and divergence in travel behaviors by sex. The gender gap in commute length of older workers is growing, even while that of younger workers steadily closes. At the same time, racial differences in mode choice and commute times are becoming less pronounced, both by race and by gender. Thus, gendered elements of travel demand are indeed evolving, if not always in predictable directions.



June 12th, 2009: Prof. Daniel Sperling, *Director of the Institute of Transportation Studies at the University of California, Davis*

Professor Sperling will be presenting “Two billion cars and the transformation of transportation.” The world is headed toward two billion vehicles. Is this sustainable? Not without transforming vehicles, fuels, and transportation—not only in the U.S., but virtually everywhere. Professor Sperling will examine the roots of the problem: the resistant auto industry, dysfunctional oil markets, shortsighted government policies, and unmotivated consumers. He will focus on the role of innovation and policy in bringing about low carbon fuels, electric-drive vehicles, socially-responsible behavior, enhanced mobility services, and low-carbon cities.

To register for either of these free seminars, and for more information on these upcoming Visiting Scholars Seminars, please visit: <http://www.utrc2.org/events/index.php>.

2009 UTRC Faculty Development Minigrants Program

The purpose of the Minigrants Program is to stimulate innovative and imaginative research by junior faculty in new and emerging areas related to transportation. In the program, the UTRC funds untenured faculty members in the development of a research working paper in their area of interest. Selected proposals receive up to \$5,000 towards the costs of developing the working paper, to be completed within a year. These working papers are independently peer-reviewed and the author of the best paper is eligible to receive a substantial grant to serve as the principal investigator for a full-scale study on the topic.

For the 2009 funding cycle, five proposals were submitted by junior faculty from four UTRC Consortium schools covering a wide range of topics. A short summary of each proposal is provided below.

Risk-Neutral Second Best Toll Pricing

Xuegang (Jeff) Ban

Rensselaer Polytechnic Institute

One form of Congestion Pricing is called Second-Best Toll Pricing (SBTP), which consists of imposing appropriate tolls at selected locations (such as bridges or tunnels) of a transportation network in order to reduce congestion. This study will expand on previous work on a risk-averse SBTP scheme, which determines the toll optimal for the “worst case” scenario, as well as traditional SBTP design schemes which are risk-prone as they are optimal for the “best case” scenario. This project will develop a risk-neutral scheme for SBTP which is designed to be optimal for the “average” scenario, i.e. the average objective value is minimized as the response varies within certain range. By considering all possible responses of motorists under a given toll, the proposed risk-neutral scheme is expected to be more reliable for toll pricing. A stochastic model for the risk-averse SBTP scheme will be developed, which will be tested on small-scale illustrative examples, as well as relatively large and real-world SBTP test examples.

Investigation of RFID Based Sensors for Sustainable Transportation Applications

Michael Carpenter

University at Albany SUNY

The purpose of this study is to investigate the viability and use of chip-less RFID based sensing

technologies for sustainable transportation purposes. Potential applications include the wireless detection of overweight trucks, remote and automated emissions monitoring of vehicles, corrosion of infrastructure, and transportation security applications. Sustainable transportation would be improved through savings realized by a reduction in the cost of sensor technologies as well as the significant cost savings and environmental impacts realized by reducing the damage to roads and bridges by the efficient detection of overweight trucks, a reduction in the number of vehicles with emissions violations, in-situ detection of infrastructure corrosion to enable just in time maintenance, and improved safety of mass transit. The study will determine the types of coatings required for these transportation related applications and predict the magnitude of dielectric function changes occurring as well as the sensitivity and selectivity of detection.

Modeling High-emitting Events of Vehicular Ultrafine PM Number Emissions

H. Oliver Gao

Cornell University

This research will focus on modeling high-emitting events of vehicular PM number emissions, that is, peak events of short duration with high particle number concentrations, by modeling the upper distribution of particle number concentration along a route. To model high-emitting events, this study will implement two statistical methods, quantile regression and binary response models. The first approach involves the development of a function consisting of vehicle operating parameters and other covariates that influence a selected percentile of particle emission rates on each route. In the second approach, a binary response model, such as a logistic regression, will be used to analyze high-emitting events. The response variable for this model would indicate whether the particle number emissions had exceeded a predefined threshold or not. The emission model will determine the factors that increase the probability of having a high-emitting event and predict these events along a route.

Estimating the Effects of Car Sharing on Household Travel and Parking Demand

David King

Columbia University

This study examines the potential benefits of car sharing through a survey of car share members in Manhattan. Since Manhattan is very densely populated, most residents do not own cars and most already use transit or walk to their destinations. As a result, car sharing may actually increase the total auto travel in the borough by making car ownership affordable for more households because car share members do not have to pay the high fixed costs of parking, insurance and vehicle financing. While these effects would not negate the benefits of car sharing, they may suggest limits to the claims of car sharing proponents. This study will estimate the effect of car sharing on total travel, explore the impact of car sharing on parking demand, and examine the effect of car sharing on the total transportation costs for households.

Investigation of Rheological Behavior of Asphalt Binder Modified by Warm Mix Asphalt Additives

Huiming Yin

Columbia University

Warm mix asphalt (WMA) technologies have attracted great interest in pavement engineering due to their potential energy savings and environmental benefits. WMA technologies use some additives to modify the rheological behavior of asphalt binders to improve the workability of the mix at lower temperatures. This study will evaluate the effect of three kinds of WMA additives on rheological behavior of asphalt binders. It will rationalize the engineering practice of WMA and provide a novel formulation to derive the production temperature and volume proportion of the WMA additive based on the asphalt binder grade and asphalt types. The success of this work will lead to the significant advances in asphalt pavement construction. In addition, the integrated multiscale research approach will provide a protocol

to develop other types of WMA and promote this green technology.

NYMTC's Alan Borenstein Retires After 25 Years of Service

UTRC congratulates Alan Borenstein, Deputy Director of the New York Metropolitan Transportation Council (NYMTC), who will be retiring at the end of April 2009. UTRC and NYMTC have worked closely together on numerous research and technical assistance projects and Alan's input has been influential in the successful undertaking of several of these. Among more the notable has been the September 11th Memorial Program Academic Initiative, which is co-sponsored by NYMTC and UTRC and led by Alan and Gerry Bogacz at NYMTC as well as administered by UTRC. Alan's dedication to this memorial program for the three NYMTC staff that died on September 11th has led to the selection and professional development of 18 highly qualified students from UTRC consortium schools over the past 4 years, all of whom have made or are making significant contributions to improve transportation throughout the region.

As a deputy director at NYMTC since 1993, Alan has assisted the executive directors in managing a staff of about 100 people to coordinate transportation planning for New York City and the surrounding five counties. Some achievements have included: developing a Web-based Unified Planning Work Program Tool for interactive participation by members that annually develop a \$45 million program; managing office relocations after losing offices at the World Trade Center in 2001; and founding "NYMTC-Notes," NYMTC's bi-weekly newsletter. He has also served as Acting Director at various points in time. Alan began his career at NYMTC in 1983 as an associate accountant to develop NYMTC's accounting and administrative systems and worked his way up to his current position.



Alan's educational achievements include receiving a B.A. degree in accounting from Queens College in 1975, a certificate in computer programming from NYU in 1981, attending the CUNY Graduate School Masters in Engineering and Transportation Planning Program from 1994 to 1995, and attending Hofstra University's M.B.A. program for accounting in 1978.

UTRC and its staff appreciate Alan's dedication and contributions in meeting the highly complex transportation needs of the New York metropolitan area, and we wish him well in his retirement.

Faculty from Region II Universities at 2009 TRB Annual Meeting

Faculty, staff, and students from Region II universities attended the 2009 TRB annual meeting in force this past January. Below is a list of presentations, panels, and poster sessions by academic researchers in the region.

Xuegang (Jeff) Ban, (RPI) *Origin-Destination Estimation and Traffic Modeling in Networks, Highway Capacity Analysis for Intersections, Applications of Intelligent Transportation Systems: Monitoring and Managing Traffic, Pricing Economic, and Investment Models in Networks, Network Modeling Innovations*

Thomas A. Bennert, (Rutgers) *Lessons Learned Through Forensic Analysis of Hot-Mix Asphalt Pavements, Dynamic Modulus and Flow Number Measurements of Asphalt Concrete*

Athanassios Bladikas, (NJIT) *Impact of Major Weather Events, Part 1*

Maria Boilé, (Rutgers) *Improving Efficiency at Intermodal Freight Terminals, Current Research on*

Marine Transportation and Freight Systems, Freight and Transit Network Models, Disaster Evacuation and Other Applications of Network Modeling, Network Modeling Innovations

Allison L.C. Cerreno, (NYU) *Financing Passenger Rail*

Cynthia Chen, (CCNY) *Understanding Human Behavior: New Insight, Innovative Ideas in Rail Transit Operations Planning and Light-Rail Transit, Modeling Location Choices in Land Use and Transport Interaction, Decision Processes That Give Rise to Activity-Travel Patterns*

Stuart S. Chen, (SUNY) *Friction Measurement and Passive Snow Control in Winter Maintenance*

Steven I. Chien, (NJIT) *Energy and Environment: Railroad Contributions, Impact of Major Weather Events, Part 1, Network Modeling Innovations, Freight and Transit Network Models*

Janice R. Daniel, (NJIT) *Impact of Major Weather Events, Part 1*

Huaizhu Oliver Gao, (Cornell University) *Environment and Energy, Transportation Energy Innovations, Cutting-Edge Statistical Methods, Models, and Applications in Transportation Research*

Cameron E. Gordon, (University of Canberra) *Congestion Pricing Research: Laying the Foundation for the Future*

Nenad Gucunski, (Rutgers) *Spectral Analysis of Surface Waves for Pavement Evaluation, Using Information Technologies to Support Better Construction Management, Characterizing Aggregate Properties and Evaluating Aggregate Performance in Pavement Layers, Highway Bridge Deck Monitoring and Preservation Strategies Long Term Bridge Performance, Part 2*

Daniel B Hess, (SUNY) *Public Involvement in Transportation*

Lynne H. Irwin, (Cornell University) *Strength and Deformation Characteristics of Pavement Sections Committee*

David King, (Columbia) *Congestion Pricing Research: Laying the Foundation for the Future*

Catherine T. Lawson, (SUNY) *Executive Information Needs and Data Availability*

George C. Lee, (SUNY) *New Bridge Systems for Post-Earthquake Serviceability*

George List, (North Carolina State University) *Origin-Destination Estimation and Traffic Modeling in Networks*

Rongfang (Rachel) Liu, (NJIT) *Current Research on Marine Transportation and Freight Systems, Rapid Transit Gets Personal: Development, Evaluation and Sustainability, Paradigm Shifts for Commuter Rail, Part 2, Innovative Ideas in Rail Transit Operations Planning and Light-Rail Transit, Major Activity Circulation Systems and Their Performance Measures*

Jerome M. Lutin, (NJIT) *Advances in Metropolitan Transportation Planning*

Ali Maher, (Rutgers) *Characterizing Aggregate Properties and Evaluating Aggregate Performance in Pavement Layers, Long-Term Bridge Performance Program, Part 1*

Jay N. Meegoda, (NJIT) *Application of Contracts, Gaming Simulation, and Information Systems to Highway Maintenance*

Yussuf A. Mehta, (Rowan) *Motorcycle Crashes: Research Insights*

Robert B. Noland, (Rutgers) *State and Regional Economic Effects of Highway Development, Transportation and Land Development Innovations, Dynamics, Sensitivity, and Variability of Travel Demand, Current Issues in Aviation, Climate Change Mitigation: Measurement and Policies, Transportation Energy Innovations, Cutting-Edge Statistical Methods, Models, and Applications in Transportation Research*

Kaan Ozbay, (Rutgers) *Congestion Pricing Showcase: Lessons from Today's Projects and Studies, ITS Deployment: System Integration and Maintenance, Cellular Transmission and Traffic Simulation: Models and Applications*

Andrew Parker, *Next-Generation General Public Demand-Responsive Transportation*

Neville A. Parker, (CCNY) Current *Research on Marine Transportation and Freight Systems*

Jonathan R. Peters, (CCNY) *Congestion Pricing Research: Laying the Foundation for the Future*

Elena Prassas, (Polytechnic, NYU) *Highway Capacity and Quality of Service Committee*

Richard P. Roess, *Highway Capacity for Freeways and Arterial Facilities*

Nagui M. Rouphail, (North Carolina State University) *Integration and Co-Benefits of Climate Change Mitigation Policies, Planning for Pedestrians, Recent Evaluations of Traffic and Traveler Information, Understanding and Improving Mobility and Accessibility for Seniors and Persons with Disabilities*

M. Ala Saadeghvaziri, (NJIT) *Improving Concrete Bridge Deck Performance*

Adel W. Sadek, (SUNY) *Operational Effects of Geometrics*

Raghavan Srinivasan, (University of North Carolina) *Thomas B. Deen Distinguished Lecture and Presentations of Awards for Outstanding Papers, Research in Bicycle Transportation*

Hualiang Teng, *Environment and Energy, Contemporary Geometric Design Issues: Intersections, Driveways, and Cable Barriers, Improving Safety and Mobility in Work Zones, Annual Average Daily Traffic, Speed, and Weigh-in-Motion*

Sotiris Theofanis, (Rutgers) *Improving Efficiency at Intermodal Freight Terminals, Current Research on Marine Transportation and Freight Systems, Freight and Transit Network Models, Network Modeling Innovations, Disaster Evacuation and Other Applications of Network Modeling*

Mark A. Turnquist, (Cornell) *Network Modeling Innovations, Disaster Evacuations and Other Applications of Network Modeling*

Sattish V. Ukkusuri, (RPI) *Traffic Assignment and Routing Models in Networks, Road Safety Evaluations, Part 1, Applications of Intelligent Transportation Systems: Monitoring and Managing Traffic, Current Research on Transportation Security, Evacuation Simulation, Modeling, and Optimization, Network Modeling Innovations, Network Design Problems: Reliability, Robustness, and Capacity Improvements*

Jose Holguin-Veras, (University of Nevada-Las Vegas) *Congestion Pricing Showcase: Lessons from Today's Projects and Studies, Road User Charging and Trucking: Is There Common Ground?, Freight System Research, Current Issues in Aviation, Tools to Modernize Large-City Transportation in the United*

States, Innovations in Freight Modeling, Congestion Pricing Research: Laying the Foundation for the Future

Thomas H. Wakeman III, (Stevens Institute of Technology) *Moving Freight Through Global Change Part 1: Hunting for Carbon Reductions*

Qian Wang, (SUNY) *Travel Demand Forecasting Innovations, Congestion Pricing Showcase: Lessons from Today's Projects and Studies, Freight Systems Research*

Rachel R. Weinberger, (University of Pennsylvania) *Parking Supply and Pricing Strategies to Influence Travel Behavior, Public Transportation Planning and Development, Automobile Ownership, Mode Choice, and Ethnicity in Transportation*

James J. Winebrake, (Rochester Institute of Technology) *Parking Supply and Pricing Strategies to Influence Travel Behavior, Public Transportation Planning and Development, Automobile Ownership, Mode Choice, and Ethnicity in Transportation, Climate Change and Maritime Transportation, Moving Freight Through Global Change Part 1: Hunting for Carbon Reductions, Green Maritime Transportation: Reducing Carbon and Other Emissions Sooner Rather Than Later*

Symposium: NextGen: The Future of Aviation

On February 25, 2009, the Port Authority of New York and New Jersey (PANYNJ) and UTRC convened a half-day symposium "NextGen: The Future of Aviation." Attended by nearly 300 individuals from around New York State and the nation, the symposium generated support and a call for action for faster deployment of the Federal Aviation Administration's Next Generation Air Transportation System (NextGen), which promises to improve the current antiquated air traffic control system.

The aviation industry is vital and fundamental to our national economy and to its continued level of prosperity. Over 11 million people work in aviation related jobs, generating over \$1.2 trillion of economic activity. The industry contributes approximately 5% of the nation Gross Domestic Product (GDP), with a direct link between aviation growth and the GDP growth.

Unfortunately, the National Airspace System (NAS), the backbone of the aviation industry, is at its saturation point, with antiquated ground-based radar technologies no longer able to accommodate the growth of U.S. aviation. These constraints are causing flight delays throughout the system, posing a threat to both our regional and national economic growth and prosperity. It is estimated that delays will only grow worse as the number of passengers flying each year in the U.S. continues to rise. Delays resulting from these constraints of the current NAS are very costly in terms of lost time to the traveling public, loss of productivity, wasted fuel and pollution, with costs continuing to rise if nothing is done.



The problem of flight delays is especially acute in the New York metropolitan area, with the cascade

effects that impact flights at airports throughout the global system. The New York metropolitan area's three major airports have consistently ranked among the nation's worst in on-time performance. These three airports, which handle about one-third of the nation's flights, are ultimately responsible for nearly three-quarters of nationwide delays. According to "Grounded: The High Cost of Air Traffic Congestion," a report released by the Partnership for New York City, flight delays caused by air traffic congestion at the New York region's three major airports were responsible for more than \$2.6 billion in losses to the regional economy in 2008, and – if no action is taken – will total a staggering \$79 billion over the eighteen-year span between 2008 and 2025. As a result, the New York metropolitan area, which requires an air transportation system that is efficient and universally accessible, is at risk to lose its status as a thriving center of international business, finance and innovation.

In addition, with insufficient investments in transportation infrastructure, the United States is suffering in the global arena in various ways. European countries have implemented programs such as SESAR (Single European Sky ATM Research), reflecting an understanding of the importance of investing in the aviation infrastructure to support economic, quality of life, environmental and energy goals. Others around the world are moving ahead and outpacing the U.S. Given New York's critical role as an international and national gateway for the United States, if we do not figure out a way to fund these much-needed investments, New York will lose on all these counts and the United States will lose a critical link in the global arena.

By making some strategic investments to expand the regional airport capacity, the PANYNJ understands these challenges and fully appreciates the level of investment needed to keep our regional airports competitive; there will be no costless solution to the current problem. The PANYNJ has taken various steps to enhance capacity and meet air travel demand, identifying initial actions at all three airports to provide some improvements in airfields, terminals and runways that will create incremental capacity. It is also acquiring a new facility – Stewart International Airport in Newburgh, NY – as the fourth regional airport to relieve delays at the other three area airports. The modernization and expansion of this airport is expected to help meet the growing regional demand for air travel and alleviate delays at the three major airports. The PANYNJ has rededicated capital funds into projects for improving runways and taxiway capabilities – projects with the potential to make airport operations more efficient and reduce delays. It has invested in new technologies to allow more efficient movement of aircraft in its facilities and made improvements to customer service for travelers. But the PANYNJ recognizes that to fully meet the expected demand, more ambitious investments will be needed that will require leadership from business, civic and labor organizations in order to build political consensus in support of expanded airport capacity.

In February 2007, the Federal Aviation Administration (FAA) announced its NextGen program, which envisions the use of satellite-based navigational systems across the national airspace, an important technological advance that will, over time, provide significant enhancements to the movement of air traffic. NextGen is an umbrella term for the ongoing, wide-ranging transformation of the national airspace system. At its most basic level, NextGen represents an evolution from a ground-based system of air traffic control to a satellite-based system of air traffic management. When fully implemented, NextGen promises to alleviate delays at the nation's most congested and delay-prone airports by safely allowing more aircraft to fly more closely together on more direct routes, reducing delays and providing unprecedented benefits for the environment and the economy through reductions in carbon emissions, fuel consumption, and noise. The FAA estimates that the NextGen program, once implemented, will reduce delays in the nation by 30-35% and in the New York region by up to 60% at John F. Kennedy International and up to 90% at Newark Liberty International.

It is thus incumbent upon those who work in the aviation industry and its stakeholders to get the message out and call for leadership at FAA on implementing NextGen now. This message has been documented by the Partnership for New York City and plainly stated by the speakers of this symposium: inaction, or short-term band-aid solutions, are no longer viable options. Bold action is required by policymakers to restructure the way the system moves airplanes and passengers through the region. We must now increase the investment in our national airspace system by targeting the deployment of NextGen Technologies throughout the nation's most congested airspace here in the New York region, if we want our region to continue to thrive economically as a global gateway.

Rensselaer Polytechnic Institute (RPI): Evacuation Simulation

RPI's Center for Infrastructure and Transportation Studies in conjunction with the Urban ITS Center of the Polytechnic Institute of New York University recently conducted tabletop exercises concerning evacuation of a small size stadium in Troy, New York. These tabletop exercises were meant to: illustrate the traffic conditions in the event of an evacuation; show the effects of emergency scenarios and/or traffic remediation; and facilitate communications between stakeholders to better prepare for such an event. The project was made possible by funding from the New York State Department of Transportation and the Federal Highway Administration.



The stadium in question was the Joseph L. Bruno Stadium located in the Hudson Valley Community College campus in Troy, New York. In the summer this stadium is home to the Tri-City Valley Cats, a minor league baseball team. Sometimes the number of spectators is at or near the capacity of the stadium. If there were ever a time when spectators needed to be evacuated as quickly as possible from the area, it would result in major problems to the local road network with the prevailing conditions. In order to find ways to make improvements, the first goal was to find a way to simulate traffic conditions (ideally in real-time) with as much detail as possible, in a way that was still understandable for a small audience knowledgeable about the local area. It was determined to use the microsimulation software TransModeler by Caliper Corporation, due to its power as a simulator along with its ease of use in modifying simulations to mimic real-life traffic controls. Data such as the traffic distribution among the local parking lots, walking time to these parking lots, signal timing plans, typical attendance records, traffic counts, and the geometric road layout itself were collected and used as inputs for the model.

At the tabletop meeting the participants were given a chance to see the model run under normal conditions and verify it was as expected or make comments so the team could make the necessary changes. Clearance times for the various parking lots and local links were used as performance measures. Presenting these results to local officials from police, fire, campus security, and transportation departments at the first tabletop meeting on December 5, RPI and NYU-Poly were able to determine likely behaviors in the event of an evacuation. Also during this tabletop, emergency scenarios involving dark signals and failing intersections were discussed, and the participants vocalized their likely solutions to these problems. Keeping in mind the limited resources of the local municipalities, suggestions to improve the network focused primarily on placement of police officers to guide traffic, intersections where the signal controls would be modified, lanes that could be closed off, and variable message signs to aid drivers in route decisions.

Knowing how the stakeholders would react to the evacuation scenarios, the simulations were modified to illustrate the probable real-world conditions. In addition to noting the effects of these, the research group tested their own improvements with the same constraints on operability. All of this was shown during the second tabletop on February 6. Generally, the stakeholders present (some of which were not

at the first meeting) found the findings to match their expectations, and all of them agreed that the process of simply bringing together the various officials for review of evacuation strategies was a worthwhile exercise. With the new results, they discussed more ways that the network could be improved to facilitate faster egress of spectators. The versatility in using microsimulation for such an exercise was documented, and in this situation was able to accurately mimic traffic control behavior and show useful animations and data for the presentation.

RPI Lighting Center: Researchers Develop Method to Reduce Headlamp Glare and Maintain Maximum Roadway Visibility

Within recent years, complaints of headlamp glare dramatically increased to the National Highway Traffic Safety Administration (NHTSA) after vehicles with new headlamp color, higher light output, and higher mounting heights took to American roadways. Scientists at Rensselaer Polytechnic Institute's Lighting Research Center, through funding from NHTSA, have developed and demonstrated a method to reduce headlamp glare and maintain maximum visibility.



Evidence indicates that present-day low-beam vehicle headlamps do not provide sufficient visibility for driving speeds higher than 30 to 40 mph. However, few drivers use their high beams for fear of creating glare for oncoming motorists. Some vehicle lighting manufacturers have developed sensors that determine the distance and location of oncoming vehicles and adjust the headlamp's brightness to reduce glare. However, this adjustment can also inhibit the driver's visibility.

Scientists at the Lighting Research Center developed a method, called the Prime Beam, designed to work in conjunction with sensors to maximize visibility with high-beam headlights. It works by removing the precise angular region of the headlamp beam pattern that creates glare for oncoming drivers. As

demonstrated in field tests, the method allows drivers to leave their high beams on to achieve maximum roadway visibility without the fear of causing glare for oncoming drivers.

This development culminates a two-year research project funded by NHTSA to examine the causes and effects of headlamp glare including the risks associated with glare to oncoming drivers, increased risks to drivers on two-lane highways, increased risks to drivers over the age of 50, and the overall effects of glare on driver performance.

According to John Bullough, Ph.D., head of the Lighting Research Center's Transportation Lighting Program and co-principal investigator on the project, glare is a sensation caused by bright light in one's field of view. Glare can reduce one's ability to see, create feelings of discomfort or both.

"It's difficult to directly link glare to crash risk because there are very few accident records attributing glare as the cause of the crash," says Bullough. "However, since glare reduces visibility, it is logical to use reduced visibility as a surrogate factor for crash risk, which we did. We also looked at drivers' behaviors such as head movements and speed variability as safety surrogates, which seem to occur more frequently when crash risk is higher. In our studies, these different surrogate measures all consistently indicated that glare increases crash risk."

But glare can also be deceiving, warns Bullough. "A driver's visibility may be impaired by glare without the driver experiencing much discomfort. And some people, especially older drivers, may experience problems with visual re-adaptation—the ability of the eyes to recover their sensitivity to see objects after exposure to glare, even when the vehicle has already passed by."

Bullough worked on the project with Lighting Research Center Director Mark Rea to further examine how headlamp mounting height, lamp aim, headlamp beam distribution, headlamp color, headlamp size, and

cleanliness and condition of headlamps and windshields contributed to glare, crash risk and changes in driving performance.

They found that two-thirds of the several hundred vehicles tested in the study had at least one mis-aimed headlight, either aimed too low or too high. According to Bullough, a mis-aimed headlight influences visibility and glare more than several other factors including the type of bulb that's used.

The Lighting Research Center's findings on vehicle headlights, visibility and glare were published by NHTSA in a series of four reports, the last of which was released in December 2008. All four reports are available on the NHTSA Web site (see listing below).

Bullough and Rea were invited in 2007 to summarize their first series of findings in a report submitted by NHTSA to Congress as part of the requirements of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). SAFETEA-LU legislation addresses the many challenges facing the nation's transportation system and lays the groundwork for addressing future challenges. For more information about SAFETEA-LU, visit www.fhwa.dot.gov/safetealu/legis.htm.

Lighting Research Center Reports Published by NHTSA:

Nighttime Glare and Driving Performance: Report to Congress

http://nhtsa.gov/staticfiles/DOT/NHTSA/NRD/Multimedia/PDFs/Crash%20Avoidance/2007/Glare_Congressional_Report.pdf

Nighttime Glare and Driving Performance: Research Findings

<http://nhtsa.gov/staticfiles/DOT/NHTSA/NRD/Multimedia/PDFs/Crash%20Avoidance/2008/811043.pdf>

Investigation of Safety-Based Advanced Forward-Lighting Concepts to Reduce Glare

<http://nhtsa.gov/staticfiles/DOT/NHTSA/NRD/Multimedia/PDFs/Crash%20Avoidance/2008/811033.pdf>

Sensitivity Analysis of Headlamp Parameters Affecting Visibility and Glare

<http://nhtsa.gov/staticfiles/DOT/NHTSA/NRD/Multimedia/PDFs/Crash%20Avoidance/2008/811055.pdf>

Research Grants News

The following is a list of new projects awarded since the last edition of this newsletter:

UTRC-Administered Research Projects:

Feasibility Study for Freight Data Collection (awarded by NYMTC to Dr. J. Holguin-Veras, RPI)

Modeling Unbound Pavement Material (awarded by NYSDOT to Dr. Lynne Irwin)

Multiple Stress Creep Recovery (awarded by NJDOT to Dr. Yusuf Mehta, Rowan University)

Reliability of NYS Bridge Inspection Program (awarded by NYSDOT to Dr. Anil Agrawal, CCNY)

Potential for Natural Brine for Anti-Icing and De-Icing (awarded by NYSDOT to Dr. Kauser Jahan, Rowan University)

Potential Long Island Intermodal Sites Study (awarded by NYSDOT to Dr. Robert Paaswell of CIUS)

Potential for Natural Brine for Anti-Icing and De-Icing (awarded by NYSDOT to Dr. Kauser Jahan, Rowan University)

Determining Remaining Fatigue Life of In-Situ Mast Arm Traffic Signal Reports (awarded by NYSDOT to Dr. Stuart Chen, University at Buffalo)

Non-UTRC-Administered Research Projects:

Buffalo CarShare (awarded by NYSDOT to Creighton Randal, Buffalo CarShare)

CuseCar Community CarSharing Program (awarded by NYSDOT to Vita DeMarchi, CuseCar, Inc.)

Design for Deflection Control vs. Use of Specified Span-to-Depth Ratio Limitations (awarded by NJDOT to Dr. Ala M. Saadeghvaziri, NJIT)

New York Canal Modern Freight-Way: Report and Sensitivity Analysis (awarded by NYSDOT to Jeff Belt, Goodban Belt, LLC)

Personal Rapid Transit in Ithaca, New York (awarded by NYSDOT to Paul Wilke, P.E., C&S Engineers, Inc.)

Reducing Vehicle Miles Traveled Through Smart Land-Use Design (awarded by NYSDOT to Dr. Adel Sadek and Dr. Qian Wang, University at Buffalo)

Study of Commercial Vehicle Empty Backhaul Activity (awarded by NYSDOT to Ross Sheckler, Calmar Telematics, LLC)

Transportation System Management under Multiple Hazards (awarded by FHWA to Adel Sadek, Qian Wang and George Lee, University at Buffalo)

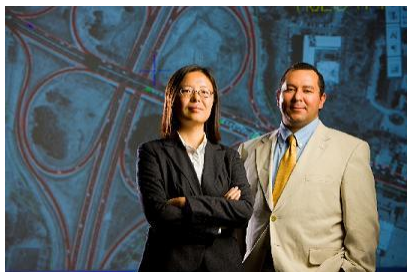
Understanding Commuter Patterns & Behavior: An Analysis to Recommend Policies Aimed at Reducing Vehicle Use (awarded by NYSDOT to Research Foundation of SUNY, University at Albany)

Urban Distribution Centers: A Means for Reducing Freight VMT (awarded by NYSDOT to Dr. Hyeon-Shic Shin, NYU)

Using TRANSIMS to Model University Campuses Transportation Systems (awarded by FHWA to Adel Sadek and Irene Casas, University at Buffalo)

News and Notes

University at Buffalo



Building on its expertise and accomplishments in the physical protection of transportation infrastructure, the Department of Civil, Structural and Environmental Engineering (CSEE) at the University at Buffalo (UB) recently established a new interdisciplinary program in transportation systems engineering. The program is led by two CSEE faculty members, Dr. Adel Sadek and Dr. Qian Wang, though several other faculty members, from all across UB, are heavily engaged in developing and shaping the program.

Five new transportation graduate courses have been recently added to the CSEE graduate course offerings to help build an interdisciplinary graduate program that would prepare the next generation of transportation systems engineers to the transportation challenges of the 21st century. On the research side, the vision for the new program is to integrate transportation systems research with research in information and computing technology, extreme event hazard mitigation, and sustainable development. While centered in CSEE, the program will be truly interdisciplinary, building on existing strengths at UB, and cutting across traditional disciplinary lines.

Rowan University: Outstanding University Student Transportation Research Award



The New Jersey Department of Transportation (NJDOT) presented the Outstanding University Student Transportation Research Award to Vivek Jha, a graduate student at Rowan University, for work he did on NJDOT-sponsored projects that involved designing a pavement catalog, which would be used for the construction of roads in New Jersey. The award is given to one student from each university in partnership with NJDOT.

Jha also has been working on a project sponsored by the Rhode Island Department of Transportation, which has led to recommendations to that state on ways to mitigate fatigue cracking.

Hofstra University Faculty News

Jean-Paul Rodrigue's second edition of his textbook, *The Geography of Transport Systems*, will be published in May 2009. His co-authors are Claude Comtois and Brian Slack. Primarily targeted for undergraduate students, this edition provides a comprehensive and accessible introduction to the field with a broad overview of its concepts, methods and areas of application. It is highly illustrated and a companion web site has also been enhanced for the book. It contains PowerPoint slides, exercises, databases and GIS datasets and can be accessed at <http://people.hofstra.edu/geotrans>.

Also, Dr. Rodrigue, with co-author Anthony Hatch of ABH Consulting, published a report in February 2009 on North American Intermodal Transportation: Infrastructure, Capital and Financing Issues. This report discusses serious limits in existing practices of intermodal transportation within North America. Intermodal assesses the financing models related to the next generation of intermodal terminals equipment, while focusing on the feasibility of public/private partnerships.

Recent Publications

M. Smith, A. W. Sadek and S. Huang. (2008). Large-scale Microscopic Simulation: Toward an Increased Resolution of Transportation Models. *ASCE Journal of Transportation Engineering*, Vol. 134, No. 7, pp. 273-281.

Gagnon, C., A. W. Sadek, A. Touchette, and M. Smith. (2008). Calibration Potential of Common Analytical and Micro-simulation Roundabout Models: A New England Case Study. *Transportation Research Record: Journal of the Transportation Research Board*, No. 2071, pp. 77-86.

Wang, Q., and J. Holguín-Veras. (2008). Investigation of Attributes Determining Trip Chaining Behavior in Hybrid Microsimulation Urban Freight Models. *Transportation Research Record: Journal of the Transportation Research Board*, No. 2066, pp. 1-8.

Wang, Q., M. Jaller, and W. Bequette. (2008). Solving Dynamic Traffic Routing Problems Using Advanced Process Control Algorithms. XV Panamerican Conference. Cartagena de Indias, Colombia, September, 2008.

S. Lawe, J. Lobb, A.W. Sadek, S. Huang, and X. Chie. (2009). TRANSIMS Implementation in Chittenden County, Vermont: Development, Calibration and Preliminary Sensitivity Analysis. *Transportation Research Record: Journal of the Transportation Research Board (in press)*.

Wang, Q., and J. Holguín-Veras. (2009). Tour-based Entropy Maximization Formulations of Urban Commercial Vehicle Movements. Presented at the 88th Annual Meeting of the Transportation Research Board. Washington D.C., January, 2009.

Holguín-Veras, J., Q. Wang, N. Xu, K. Ozbay, and M. Cetin. (2009). The Impacts of Time of Day Pricing on Car User Behavior: Findings from the Port Authority of New York and New Jersey's Initiative.

Presented at the 88th Annual Meeting of the Transportation Research Board. Washington D.C., January 2009.

H. Zhou, J.N. Ivan, and A.W. Sadek. (2009). Safety Effects of Exclusive Left-Turn Lanes at Unsignalized Intersections and Driveways. Presented at the *88th Annual Transportation Research Board Meeting*, Washington, D.C.

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