National Urban Freight Conference Showcases Latest Trends in Goods Movement

More than 200 researchers, practitioners, and government staffers shared the latest research at METRANS’ National Urban Freight Conference February 1-3 in Long Beach, California. The first of its kind, the National Urban Freight Conference focused on the consequences of increasing freight flows throughout America’s urban areas. Research presentations covered six separate tracks: Modeling, Port Operations, Transport Economics, Environment, Policy/Institutions, Security/Vulnerability, and Best Practices/Lessons Learned. (See highlights of papers from each track on p.2)

Sixty-nine research papers were presented, along with two plenary sessions by industry experts. More than 30 universities were represented, from across the U.S. and abroad, including Europe and Asia.

METRANS Director Genevieve Giuliano commented that she was most gratified with attendance, sponsorships, and the obvious engagement and interest of participants.

Research Challenge. Highlighting the event was Lillian Borrone, Chair of the Eno Transportation Foundation. Borrone challenged the researchers to help the nation meet its critical needs for better transportation infrastructure. She noted that as more manufacturing moves offshore, locals are less knowledgeable and tolerant of necessary freight transportation.

“Pay attention,” she continued, “to the Transportation Research Board’s (TRB) 2005 list of critical issues” when selecting research topics. They are: congestion, emergencies (including terrorist strikes), energy and the environment, equity (fairness for disadvantaged groups), finance, human and intellectual capital, infrastructure, institutions (21st century institutions mismatched to 20th century missions), and safety.

Borrone also asked the audience to use the conference as a springboard for new research questions, which she offered to compile for the TRB’s future consideration.

Global Trends. Paul Bingham, principal in the Global Trade and Transportation Practice of Global Insights, projected containerized trade will continue to outpace world GDP growth.

(Continued on page 4)
Selected papers from each track of METRANS’ recent National Urban Freight Conference are highlighted below. Complete papers are available at www.metrans.org.

Track I—Port Economics

“Port and Modal Elasticity Study,” by Robert C. Leachman, University of California at Berkeley.

Robert Leachman describes an optimization model of waterborne containerized imports from Asia to the U.S.A. Imports are allocated to alternative ports and logistics channels so as to minimize total transportation and inventory costs for each importer. Logistics channels include direct shipment of marine containers via truck or rail and transloading in the hinterlands of the ports of entry from marine containers into domestic trailers or containers.

Leachman tested the model with 2004 actual transportation costs, import volumes and declared values, plus a range of hypothetical container fees assessed on imports routed via the San Pedro Bay Ports. The results show that, without reductions in container movement lead times, container fees would result in significant diversion of cargoes to other ports. In contrast, if infrastructure is improved such that container movement lead times are significantly reduced, the model predicts little or no decrease in overall imports via San Pedro Bay but a substantial increase in trans-loaded imports for fees ranging up to $200 per container.

Track 2—Technology for Port Operations

“Intelligent Transportation System for Container Movement Between Inland Port and Terminals,” by Jianlong Zhang and Petros A. Ioannou, University of Southern California; and Anastasios Chassiakos, California State University, Long Beach.

This paper proposes an intelligent transportation system for container movement between inland port and terminals, in which fully automated trucks are employed to transfer all the containers.

The inland port, a few miles away from the terminals, is used for storing and processing import/export containers before distribution to customers or transfer to terminals.

The authors designed and analyzed such an intelligent transport system with particular attention to the overall supervisory controller that synchronizes all the operations inside the automated system. Truck platooning is used in order to simplify the control of the overall system and to minimize the possibility of deadlocks, congestion and failures. A microscopic simulation model is developed and used to demonstrate the overall performance of the proposed system.

Track 3—Transportation Investment & Spillovers

Cost Benefit Analysis of Driver Hours of Service Regulations for Long-Haul LTL Carriers," by Aviroop Mukherjee and Randolph W. Hall, University of Southern California.

Crash rates for trucks depend in part on the length of time drivers have been operating their vehicles.

This paper investigates bounds on the reduction in crash rates due to the imposition of hours-of-service regulations, which limit the hours drivers operate their vehicles.

Methods for analyzing probability distributions for trip length and odds ratios for crashes (as a function of hours driven) are developed. For example, an absolute constraint on trips of no more than eight hours would at most reduce fatalities by 3-5% compared to the current situation.

The study is a first step towards a broader cost-benefit analysis of regulations, based on analysis of data from the Fatal Accident Reporting System.

Track 4—Emissions Measurement

“Seasonal and Spatial Trends in Particle Number Concentrations and Size Distributions at the Children’s Health Study Sites in Southern California,” by Manisha Singh, Constantinos Sioutas, and Harish Phuleria, University of Southern California; and Kenneth Bowers, California Air Resources Board.

Continuous measurements of particle number, particle mass, and gaseous copollutants were obtained at eight sites (urban, suburban, and remote) in Southern California during 2002 and 2003 in support of USC’s Children’s Health Study.

Higher average total particle number concentrations are found in winter (November to February) compared to summer (July to September) and spring (March to June) in all urban sites.

Contribution from local vehicular emissions is most evident in cooler months, whereas effects of long-range transport of particles are enhanced during warmer periods.

The particle size profile is most represented by a combination of the spatial effects, for example, the sources, atmospheric processes, and meteorological conditions prevalent at each location.

Afternoon periods in the warmer months are characterized by elevated number concentrations that either coincide or follow a peak in ozone concentrations, suggesting the formation of new particles by photochemistry. Results show no meaningful correlation between particle number and mass, indicating that mass-based standards may not be effective in controlling ultrafine particles.

A work stoppage at the Port of Long Beach in October 2002 resulted in statistically significant increases in particle number concentrations in the 60-200 nm range (p<.001), indicative of emissions from ships idling at the port.

Track 5—Environmental & Economic Impacts


In a period of more than 15 years, European cities have taken measures to reduce traffic by introducing vehicle restrictions or by promoting consolidation of goods flows. The author describes a general overview of different public policies and planning in the field of urban freight transport, based on his involvement in different European (Continued on page 5)
**METRANS Outreach and Research**

**8th Town Hall to Address Balancing Economy & Environment**

More than 1,000 people are expected to attend what has become a command performance for the Southern California port community—the Annual State of the Trade & Transportation Industry Town Hall.

The massive event will bring together experts on transportation and the environment March 15 on the campus of California State University, Long Beach. (Details at left.)

Highlighting the event will be a specially produced video about improved operational efficiencies in the local harbors. John Doherty, Executive Director of the Alameda Corridor Transportation Authority, will set the stage for a panel discussion concerning the delicate balance our communities face between trade and environmental issues.

F. King Alexander, CSULB’s new president, will welcome the audience. Richard Hollingsworth, President of the Gateway Cities Partnership, Inc., will once again moderate the panel discussion and the question-answer session with the audience. One member of the panel will be State Senator Alan Lowenthal, representing District 27 that includes the Port of Long Beach. Other panelists include:

- Richard Powers, Executive Director, Gateway Cities Council of Governments;
- Stephanie Williams, Senior Vice-President, California Trucking Association;
- John Ficker, President, National Industrial Transportation League;
- Genevieve Giuliano, METRANS Director, and Domenick Miretti, ILWU Sr. Liaison for the Ports of L. A. and Long Beach, will comment and conclude the event.

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**TRB Award Goes to METRANS’ Genevieve Giuliano**

METRANS Director Genevieve Giuliano was the 2005 recipient of the prestigious W. N. Carey, Jr., Distinguished Service Award at the 85th Annual Meeting of the Transportation Research Board (TRB) in Washington, D.C. The award was presented at the Chairman’s Luncheon on January 25, 2006.

“It’s such an honor to be saluted by one’s peers,” commented Giuliano, “I was thrilled and humbled at the same time to learn that others value what I love to do.”

The Carey Award honors those who have given outstanding leadership and service to transportation, research, and to the TRB. It was named for W. N. Carey, Jr., who served as TRB’s Executive Director from 1967-1980.

Giuliano has served on TRB committees for almost 15 years, including four National Research Council (NRC) policy study committees. On those various committees, she has assessed highway improvement effects on air quality and energy consumption, compared international policies and expectations affecting public transit, evaluated congestion mitigation and air quality improvement, and explored the relationships among physical activity, health, transportation, and land use. She is currently a member of the Study Committee on Climate Change and U.S. Transportation.

In 2000, Giuliano joined TRB’s Executive Committee and currently chairs the Subcommittee on Planning and Policy Review.

“Working with my colleagues on TRB matters,” said Giuliano, “has been one of the highlights of my career. By creating a national clearinghouse of research and shaping the agenda for transportation policy, TRB helps move the country forward based on solid research. It is my honor to serve.”

The Transportation Research Board’s mission is to promote innovation and progress in transportation through research. It was founded in 1920. Today the TRB facilitates information-sharing about transportation among researchers and practitioners, stimulates research, manages multiple research projects promoting technical excellence, provides expert advice on transportation, and disseminates transportation research.
He noted that trade trends will continue to cause congestion in U.S. global gateways. As trade becomes concentrated in high-value, lightweight containerized cargo, there is increased pressure for high service infrastructure which is highly urbanized. In addition, growth continues to concentrate at key gateways which are mostly in urban areas.

Free trade policies without regard for local trade infrastructure add to gateway congestion, such as at the ports of Los Angeles and Long Beach. He concluded with a commonly asked question: “Where will the money come from to improve urban intermodal infrastructure?”

**Freight at State Level.** John Horsley, Executive Director, American Association of State Highway and Transportation Officials (AASHTO), noted that more and more states have named a special “freight office” of some sort, similar to California’s new Office of Goods Movement. Such action has also been followed by a specific plan for freight and development of public-private infrastructure investments. Finally, states are using almost unheard-of-collaboration for regional transport solutions. For example, two recently built Kansas City flyover bridges between Kansas and Missouri are intended to reduce traffic slowdowns caused by at-grade rail.

Georgia’s aggressive approach to freight transport was explained by Harold E. Linnenkohl, Commissioner of the Georgia Department of Transportation (GDOT).

With four ports, Linnenkohl noted, Georgia was named best location for logistics in late 2003 by Business Facilities magazine. Both Savannah and Brunswick ports are undergoing major upgrades.

Georgia hosts 19 rail carriers, 10 owned by GDOT, and has begun major rail improvements. Yet truck traffic is growing 50% per year faster than other vehicle traffic.

**Best Practices.** In a Best Practices session, one paper proposed the substitution of hybrid trucks for conventional diesel trucks in port drayage (trucks hauling marine containers).

Daniel Smith, Principal, The Tioga Group, Inc., called the emissions from port drayage “the most prominent and intractable problem in California’s goods movement system.” He said the cause is a fleet of 10-15,000 older diesel tractors which spend up to half their in-use time idling or “creeping.” “These operating modes produce the highest emissions from conventional diesel engines,” he said.

“Hybrid technologies could dramatically and permanently reduce emissions, noise, and fuel use while yielding both operational and cost benefits to the industry.”

Smith said the unique operating characteristics of drayage—i.e., the extensive idling, stop-and-go bursts of power, etc.—provide an ideal situation for a hybrid engine. He said that for drayage, “an electric drivetrain will start and pull heavy loads easier, smoother, and quieter, keep up with heavy traffic better, and not stall on steep ramps.”

Hence, hybrids would decrease highway congestion.

Emission advantages of hybrid engines are well known, and Smith posited that “hybrid trucks would dramatically reduce NOx and PM emissions and engine noise at idle in queuing, in stop-and-go traffic and in starting heavy loads.”

Smith said hybrid bus engines in early usage have demonstrated economic advantages. The engines are cheaper to operate, due to “increased drivetrain reliability and engine life, reduced fuel consumption, reduced maintenance costs, and improved equipment utilization.” By his projections, new hybrids could cost owner-operators less than older diesel engines.

Smith concluded by proposing a multi-phase test of hybrid drayage, starting with simulations and later including prototypes in actual service.

**Conference Contributions.** In reflecting on the conference, METRANS Director Genevieve Giuliano remarked that its contributions include “bringing together for the first time researchers from throughout the U.S. and abroad working on urban freight issues, bringing together researchers from many disciplines, as well as professionals in the public and private sector, and papers on a variety of topics, ranging from the theoretical (automated vehicles) to best practices.”

**What’s Next.** “We are considering holding another NUF next year,” said Giuliano. All research papers will be posted to the METRANS website, www.metrans.org. Some of the best papers from the conference will also be published in a special issue of a transportation journal.
**METRANS Education**

**ALISON LINDER NAMED METRANS STUDENT OF THE YEAR**

A firm believer in “smart growth,” Alison Linder was recently named METRANS Student of the Year.

Linder’s commitment to the environment is the thread that unifies her studies while working toward her Doctorate of Urban Planning in the School of Planning, Policy, and Development at USC. She is most interested in the nexus of transportation, land use and environmental quality.

She approaches transportation “as a public good.” Using that approach allows her to “use the same frameworks to think about transportation as we do with other public goods, and like any kind of development project, there will be obstacles that relate to the environment.

**Environmental Background.** After Linder’s bachelor’s and master’s programs at the University of Pennsylvania, she worked as Program Assistant for the Pennsylvania Environmental Council in Philadelphia, where she helped establish the Environmental Advisory Council Network.

In that position, she received a good acquaintance with environmental outreach and policy by developing workshops and training for members, designing an environmental networking website, and even delivering public presentations on environmental issues for municipalities.

As a METRANS Graduate Research Assistant, she collaborated on a major field research project regarding the 2002 work shutdown in the local ports. In that effort, she conducted interviews with stakeholders and analyzed data from the Metropolitan Transit Authority to determine impacts of the shutdown on public transportation.

Last year, Linder worked with the Sea Grant Center at USC, incorporating principles of smart growth into watershed education materials.

Currently with USC’s Center for Sustainable Cities, she has helped manage a team of research assistants to conduct an inventory of Los Angeles recreation facilities. This material will be the subject of a report at the forthcoming meeting of the American Association of Geographers. The Future. Alison Linder will soon be armed with a new Doctorate in Urban Planning and passion for studying the impacts of transportation on open space, habitat, and the quality of air and water. As she ponders where to apply these gifts, she notes that she would like to keep doors open both inside and outside academia, such as in research or the policy areas “where I can apply what I’ve learned.”

Having helped with teaching as a Teaching Assistant at the University of Pennsylvania and tried her hand at policy matters at the Pennsylvania Environmental Council, Linder is ready for whatever the future holds.

**Research Highlights**

*Continued from page 2*

Commission projects, in the making of an OECD report and for the Institute for City Logistics.

Visser discusses and categorizes different public measures and instruments, such as licensing and regulation, private and public initiatives to bundle goods flows, and different types of freight centers.

Track 6—Disaster Management Assessment


Using both photos and prose, this paper shows how new, commercially available satellite imagery, in combination with geographic information systems and specialty analytical tools, can analyze disaster zones faster. It focuses on the Port of New Orleans, where the technique was used during recent flooding. Multiband capability (e.g., infrared) identifies pinpoint damage in areas that could be unreachable in disasters—for example, petroleum spills.

Next, the authors will apply the system to the Ports of Los Angeles and Long Beach, providing a decision support system for disaster planning.
METRANS Research Projects Announced

METRANS Research

Newly Awarded Research Projects

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<th>Title</th>
<th>Principal Investigator(s)</th>
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<td>06-02</td>
<td>Incentivizing Truck Retrofitting in Port Drayage</td>
<td>Kristen Monaco, CSULB</td>
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<td>06-03</td>
<td>An Adaptive System for the Transportation of Commercial Goods</td>
<td>Darin Goldstein &amp; Tariq Shehab, CSULB</td>
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<td>06-04</td>
<td>Reducing Diesel NOx and PM Emissions of Diesel Buses &amp; Trucks</td>
<td>Hamid R. Rahai and Bei Lu, CSULB</td>
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<td>06-07</td>
<td>Evaluating the Efficiency of Traffic Mitigation Fees at the San Pedro Bay Ports in a Congestion-Pricing Framework</td>
<td>Seiji Steimetz, CSULB</td>
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<td>Sources of Electoral Support for Transportation Funding</td>
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<td>Better Delivery/Pick Up Routes in the Presence of Uncertainty</td>
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<td>06-13</td>
<td>The Mobility of Homeless People and Their Use of Public Transit in Long Beach, California</td>
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<td>06-16</td>
<td>Network Accessibility and the Evolution of Urban Employment</td>
<td>Christian Redfearn and Genevieve Giuliano, USC</td>
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The eight new projects include five by CSULB faculty and three by USC faculty. Among the faculty Principal Investigators, six are new to METRANS, illustrating that interest in transportation research continues to grow at both university partners, USC and CSULB.

Through 2005, more than 60 proposals have been funded. Newly released reports are shown below. All are available at the METRANS website,

Newly Completed Research Projects

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<th>Principal Investigator(s)</th>
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<td>03-06</td>
<td>Robust Investment Decisions for Highway Capacity Expansions</td>
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<td>03-07</td>
<td>Freight Routing and Containerization</td>
<td>Randolph Hall, USC</td>
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<td>03-24</td>
<td>Increasing Bus Transit Ridership: Dynamics of Density, Land Use, and Population Growth</td>
<td>Tridib Banerjee, Dowell Myers, and Clara Irazabal, USC</td>
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<td>04-13</td>
<td>Do Neighborhood Attributes Affect Commuting Times?</td>
<td>Peter Gordon, James E. Moore II and Harry Richardson, USC</td>
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<td>AR0401</td>
<td>A Study of Drayage at the Ports of Los Angeles and Long Beach</td>
<td>Kristen Monaco and Lisa Grobar, CSULB</td>
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<td>AR0402</td>
<td>Labor at the Ports: A Comparison of the ILA and ILWU</td>
<td>Kristen Monaco, CSULB</td>
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METRANS Executive Committee

Genevieve Giuliano, Director
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Marianne Venieris, Deputy Director
Executive Director, Center for International Trade & Transportation, CSULB

Anastasios G. Chassiakos, Executive Director of Assessment, College of Engineering, CSULB

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Petros Ioannou, Professor, Electrical Engineering, USC

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Michael Mahoney, Dean, College of Engineering, CSULB

James E. Moore II, Chairman, Industrial & Systems Engineering; Professor, Civil Engineering and Public Policy & Management, USC

METRANS Faculty

METRANS has funded 48 faculty at USC and CSULB who are now members of the METRANS Center. Consistent with METRANS’ interdisciplinary theme, the faculty come from six branches of engineering (aerospace, civil, computer, electrical, mechanical and industrial & systems), as well as business, economics, geography, information sciences, public policy, planning and public administration. These faculty serve as principal investigators on METRANS-funded projects. They also come together periodically to share insights through coordination meetings and conferences.

California State University, Long Beach:

Anastasios Chassiakos, Electrical Engineering
Lisa Grobar, Economics
Karl H. Grote, Mechanical, Aerospace Engineering
Mohammed Forouzesh, Health Sciences
Robert Friis, Health Sciences
Ken James, Electrical Engineering
Christine Jocoy, Geography
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Shui Lam, Computer Engineering
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Emily Parentela, Mechanical Engineering
Hamid Rahai, Civil Engineering
Tariq Shehab, Mechanical Engineering
Jalal Torabzadeh, Geography
Suzanne Wechsler, Geography

University of Southern California:

Tridib Banrjee, Policy, Planning, & Development
Satish Bukkapatnam, Industrial & Systems Engineering
Maged Dessouky, Industrial & Systems Engineering
Michael Driver, Business Administration
Genevieve Giuliano, Policy, Planning, & Development
Peter Gordon, Industrial & Systems Engineering
Randolph Hall, Civil Engineering
Le Dam Hahn, Information Sciences Institute
John Heideman, Electrical Engineering Systems
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Naj Meshkati, Industrial & Systems Engineering
James E. Moore II, Mechanical Engineering
Dowell Myers, Civil Engineering
Fernando Ordonez, Industrial & Systems Engineering
Kurt Palmer, Industrial & Systems Engineering
Mansour Rahimi, Policy, Planning, & Development
Christian Redfearn, Mechanical Engineering
Harry Richardson, Political Science
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Milhailo D. Trifunac, Geography
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METRANS Website

Information on transportation research, publications, education, training and technology transfer is currently available on the METRANS website: www.METRANS.org. The website also has a faculty directory, news and links to other relevant sites as well as information on USC and CSULB transportation education programs.
Dear Reader:

METRANS staff and faculty have been very busy since the last issue of our newsletter. In October, we received our eighth round of research proposals and sent them out for peer review. In December, we held our annual Advisory Committee meeting and celebrated the continuation of our funding under the new SAFETEA-LU with a reception following the meeting. We also issued our Applied Research call for proposals in December and are reviewing these proposals as we go to press. The entire METRANS staff spent much of January preparing for our National Urban Freight Conference. The preparations paid off; the Conference could not have been better organized. Special thanks go to Alix Traver, who took on the role of conference coordinator, and to the entire staff at CSULB. Thanks are also due to our graduate student volunteers who provided support during the conference. Our busy calendar will continue, with the Town Hall in March, Caltrans goods movement workshops in April, and preparation for an open national competition to maintain our UTC status in June.

Genevieve Giuliano
Director, METRANS Transportation Center