METRANSNEWS

METRANS Transportation Center

University of Southern California / California State University, Long Beach

INSIDE THIS ISSUE:

Conference

New Applied Research Awards	2
METRANS to Host 1st	3
National Urban Freight	

METRANS Convenes
"Mobility in the Metropolis" Conference

3

4

5

Trade Community Salutes Marianne Venieris with Olafson Award

Professor Jim Moore Receives Double Awards for Service

Crowds Pack Town Hall as Industry Examines 2004 Peak Season

Jennifer Russell Receives 6 National WTS Award

USC Students Attend 6 UCTC Conference

Eno Transportation 6 Award Goes to USC's Kenneth Husting

METRANS Executive 7
Committee, Faculty, Staff

Letter from the Director 8

METRANS was established in 1998 as a U.S. Department of Transportation University Transportation Center. Sponsored by the U.S. D.O.T. and Caltrans, METRANS is a joint partnership of the University of Southern California and California State University, Long Beach. METRANS is dedicated to solving metropolitan transportation problems through research, education and outreach

Research Profile

EARTHQUAKES, TORNADOES, AND OTHER HAZARDS INTRIGUE RESEARCHER ERIK JOHNSON

Erik Johnson is looking for a bridge slated for destruction. Even better: such a bridge in an earthquake-prone area.

Why does he need an old bridge? Specifically, he wants to test his smart damping strategies for natural hazard mitigation, structural health monitoring and damage detection. In other words, he wants to discover "how to control motion itself or mitigate the motion of a structure due to earthquakes, etc."

Based on techniques Johnson learned in aeronautical engineering, he explores new ways to detect earthquake, tornado, or other damage in bridges or buildings.

Johnson works with computer-controlled "semi-active devices" inside the structures themselves. He hopes to overcome the hazards of testing in the typical structural-safety inspection in which "the damage is done in person by the inspectors!" he says. Instead of relying on inspectors, he hopes to develop more structural health monitoring using computer-based devices to sense what is happening within the structure.



Professor Erik A. Johnson

Testing his devices, however, presents a challenge. "Most of the time, we don't want to shake a bridge or building, particularly if it could cause real damage," he says. In recent METRANS research, "We did some 'shake-table' demonstrations to show that my technology does improve the estimation of damage quite a lot. The difficulty in the next step is that it costs a lot!"

Says Johnson, "I can envision two levels: First, a large-scale but still laboratory model; second, working with one of the large-scale testing labs, where they can test structures about quarter scale."

What would an *ideal* test look like? The real test he would like to do is to use a real bridge, installing a sensing system on it. Hence, the soonto-be-demolished bridge

could also serve as a good testing device.

Johnson's background is unusual for civil engineering. His graduate work was devoted to aeronautical engineering at the University of Illinois at Champaign-Urbana. "It was actually in my graduate work that I was introduced to earthquake damage monitoring and found many interesting questions.

"I had been studying detecting the flutter of aircraft wings, and that translates almost directly into studying motion of bridges and buildings. It turns out that the mathematical modeling has a lot of similarities." Johnson explains that every aircraft has certain flight conditions that are potentially dangerous to the structure, such as combinations of altitude. speed, angle of approach, etc., so that the wings could start to flutter something like how a flag flutters. While pilots are generally taught not to fly in those conditions, it is occasionally necessary to simulate those conditions for experiments in wing configurations. Johnson learned how to simulate the conditions in mathematical algorithms.

(Continued on page 2)

NEW APPLIED RESEARCH AWARDS AIM AT "MONITORING THE PORTS"

METRANS recently funded five new projects under its applied research program, Monitoring the Ports. The applied research program is intended to attract more CSULB faculty to transportation research, and to build an information base for goods movement research being conducted at USC and CSULB.

This year nine pre-proposals were received by January 28. Six of the faculty members submitting pre-proposals were invited to submit complete proposals. Five proposals were ultimately deemed acceptable by the METRANS **Executive Committee and** awarded funds. All five projects will be conducted by professors at California State University, Long Beach, and day-to-day operation of the overall program is the responsibility of Tom O'Brien. Ph.D., METRANS Applied Research Program Coordinator.

In order to prepare for writing the proposals, a number of CSULB faculty participated in two modules of the Global



Logistics Specialist® Online. Thus, they were able to become acquainted with the language of logistics and acquire an overview of goods movement.

The newly funded projects are listed below:

Shui Lam, Engineering; "An Accurate Monitoring of Truck Waiting and Flow Times" (AR 05-01) - Based on observations obtained from a full-day of digital camera monitoring of truck movements at a marine terminal, this project will produce data concerning distribution of truck wait

times throughout the terminal; truck flow times from the entry to exit; arrival patterns and the queue lengths outside the gates; and initial queue lengths outside the entry gates.

Christopher Lee, Geography; "Feature Extraction from High Resolution Satellite Imagery as an Input to the Development and Rapid Update of a METRANS Geographic Information System (GIS)" (AR 05-02) - The project will use high-resolution satellite imagery to demonstrate how to classify Port images, detect changes, and

extract specific features for development and rapid updating of a METRANS Geographic Information System (GIS).

Hamid Rahai, Engineering; "Development of an Exposure Model for Diesel Locomotive **Emissions near the Alameda** Corridor" (AR 05-03) - The objective of this study is to measure carbon monoxide (CO), black carbon (BC) and particle concentrations due to the passage of trains on the Alameda Corridor through the City of Long Beach. The data will be used for exposure control options such as the installation of appropriate filtration systems, avoidance of building construction within a specified distance from the Corridor, and emissions control strategy.

Suzanne Wechsler, Geography; "Development of a LIDAR Derived Digital Elevation Model (DEM) as Input to a METRANS Geographic Information System (GIS)" (AR 05-04) - The purpose of this project is to obtain a high-

(Continued on page 4)

ERIK A. JOHNSON, CONT.

(Continued from page 1)

It was a fairly small step, then, from testing aircraft wings to designing damage detection for bridges and buildings.

Johnson not only went to college in Illinois, he grew up in Chicago, the heart of the Midwest. While earthquakes are not common in Illinois, he was familiar with structural damage caused by frequent tornadoes.

Johnson recently received tenure and a promotion to Associate Professor. In addition, he is a recipient of a National Science Foundation Faculty Early Career Award.

Prior to joining the USC faculty in 1999, he had been a Visiting Research Assistant Professor of Civil Engineering at the University of Notre Dame.

Re-creating his own intriguing graduate school experience, Johnson always strives to involve his graduate students in his research. In addition, he pulls in some talented undergraduates.

"I try to pick out some of the top students who would be promising candidates for graduate studies—even for Ph.D. studies—and try to expose them to research."

His USC student research team has included, Baris Erkus, Allen Au, and Dr. Mohamed Elmasry, who as a new Ph.D. recently returned to teach in his native Egypt. Johnson particularly enjoys the multi-national, multi-ethnic character of the students at USC.

Currently his students hail from Turkey, Korea, Thailand,

Hong Kong and mainland China.

His typical teaching involves both undergraduate and graduate courses in Civil Engineering.

Will Johnson's semiactive devices be installed in bridges or buildings in the near future? He suggests that the conservatism of the construction industry will make that very difficult but is optimistic that structures in the future will take advantage of these new technologies.

In the meantime, Erik Johnson is still looking for an old bridge.

METRANS TO HOST 1ST NATIONAL URBAN FREIGHT CONFERENCE

METRANS will host a national urban freight conference February 1-3, 2006, at the Westin first of its kind, in a location Hotel in Long Beach, California. This event will be the first to examine impacts of goods movement and international trade in metropolitan areas.

Most freight research is focused on inter-regional goods movement. Surprisingly little is known about the contribution of goods movement to urban congestion, air quality, or changing land use and travel patterns.

With little understanding of how the economics of trade activity are distributed across metropolitan areas, tools for modeling and forecasting freight flows within regions are not well developed. The nature of the goods movement supply chain is poorly understood, and implications of the supply chain logic for urban areas are unknown.

"We are pleased to host such an important conference, the



Photo by Ira Brown

that illustrates what the issues are about," said **METRANS** Director Genevieve Giuliano. "The Westin Hotel overlooks the Port of Long Beach, so we can clearly see what is being discussed in the research."

Researchers are invited to submit papers on the following topics:

Models for transportation, port, air, intermodal op-

erations, impact analysis; Port operations, produc-

tivity:

Trucking, air, rail economics, productivity, labor issues:

- Local and regional environmental externalities: congestion, air quality, etc.;
- Policy and institutional issues in urban goods movement;
- Security/vulnerability of goods movement infrastructure.

One-page abstracts are due October 15. They should include the purpose, method and data, as well as expected results. A review panel comprised of goods movement research experts will make selections for presentations.

Notice of acceptance will be available November 15, and completed papers are due December 15.

Submit to National Urban Freight Conference, giuliano@usc.edu.

More information is available at (562) 296-1170 or at www.metrans.org.

Latest

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More Information:

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METRANS CONVENES "MOBILITY IN THE METROPOLIS" CONFERENCE

Transportation policy makers, faculty, public agency representatives, sponsors, and students gathered at the USC campus February 9 for "Mobility in the Metropolis: Making the Most of What We Have," the latest METRANS Annual Research Conference. It was held in conjunction with the annual meeting of the METRANS Advisory Committee.

The focus of the conference was on increasing the efficiency and productivity of existing transportation systems. Results from recent METRANS research projects were showcased in a series of presentations and several poster demonstrations. Keynote speaker was Brian Smith, Caltrans Deputy Director of Planning and Modal Operations. There were two paper sessions.

Session I, "Making the Most of our Resources," was moderated by Petros Ioannou, EE-Systems, USC, and included the following presentations:

- "Evaluation of Highway Widening Plans," Peter Gordon, SPPD, USC.
- "Improved Modeling of Network Transportation Flows," by James E. Moore II, ISE, USC.
- "Optimizing Cargo Movements," by Anastasios Chassiakos, ME, CSULB.

Panel Session II, "More Effective Utilization," was moderated by Joseph Magaddino. Economics, CSULB, and featured:

- "Short Sea Shipping in

Southern California," by Le Dam Hanh, CE, USC,

- -"Wages and Working Conditions of Port Truck Drivers," by Kristen Monaco, Economics, CSULB.
- "Freight Routing and Containerization," by Randolph W. Hall, ISE, USC.

At the reception, poster demonstrations showcased other METRANS studies, including: - "Increasing Bus Transit Rid-

- ership: Dynamics of Density, Land Use, and Population Growth," by Tridib Banerjee, Dowell Myers, and Clara Irazabal, SPPD, USC.
- "SURE-SE (Sensors for Unexpected Roadway Events) Simulation and Evaluation," by John Heidemann and Genevieve Giuliano, ISI and SPPD, USC.

- "Robust Investment Decisions for Highway Capacity Expansions," by Fernando Ordonez, ISE, USC.
- "Reducing Pollutants from Mobile Sources," by Hamid R. Rahai, ME, CSULB.
- "Bridge Structural Health Monitoring," by Erik Johnson, CE, USC.
- "Investigating the Role of Driver Decisions and Styles In Highway-Rail Crossing Accidents," by Najmedin Meshkati, Mansour Rahimi and Michael Driver, CE and ISE, USC.

Copies of the research presentations, as well as project descriptions and final reports for completed projects, may be accessed on the METRANS website.

Page 4 METRANS NEWS

METRANS Research & Outreach

Trade Community Salutes Marianne Venieris with Stanley T. Olafson Award

Marianne Venieris, Deputy Director of METRANS and Executive Director of the Center for International Trade & Transportation at CSU, Long Beach, received the 2005 Stanley T.

Olafson Bronze Plague Award during the World Trade Week luncheon May 19 sponsored by the Foreign Trade Association of Southern California.

The award is considered the highest salute from the trade group to the local community.

Ms. Venieris has worked tirelessly for years to improve the professionalism of the transportation industry and to provide a neutral forum in which the

various stakeholders can meet regarding common issues. Sparked by her efforts, the first professional designation in logistics was awarded to the educational program Global

Logistics Specialist®, later followed by the Global Logistics Employee program and the Master of Arts in Global Logis-

An audience of more than 300 executives applauded as Charlie Woo, Chairman of Megatoys, awarded the plaque to Ms. Venieris. Olafson spearheaded the celebration of World Trade Week as a member of the Los Angeles Chamber of Commerce in 1926.



Professor Jim Moore Receives Double Awards For Service

Prof. James Moore II was recently awarded the first-ever Diversity Award by the Los Angeles Chapter of WTS (formerly Women's Transportation Seminar). He was also the recipient of the USC Academic Senate Distinguished Faculty Service Award.

In saluting Moore, WTS recognized his longstanding efforts to introduce his students, particularly women and international students, to opportunities and networks that WTS affords.

Moore said, "I initially identified WTS as an organization supportive of my students, but it had a double advantage

because it supported USC's commitment to affirmative



action." He encourages students to be active members. "Clearly, there's a more level playing field, and in most respects the industry is no longer a 'good old boys' club, with more women in leadership. Brains matter, and that's gender neutral," he notes.

The Academic Senate Distinguished Faculty Award is given to recognize dedicated and exemplary service to the faculty and the greater USC community.

In accepting the award, Moore acknowledged he could have been knocked over "with a feather!" He is too modest to attribute the reason to anvthing but luck, but his colleagues note that Moore is one of the school's most hardworking academics.

As a resident faculty member living in undergraduate residence halls during 15 of the last 16 years, Moore says he tries "to make sure the University actually functions like the kind of place we describe to the students in the brochures we give them."

Moore is chairman of the Daniel J. Epstein Department of Industrial and Systems Engineering in the Viterbi School of Engineering while he continues to direct the transportation engineering Masters degree. Moore is also one of the founders of METRANS and still serves on the METRANS Executive Committee. He joined the USC faculty in 1988.

NEW APPLIED RESEARCH AWARDS, CONT.

(Continued from page 2) resolution, highly accurate elevation data set of the port complex using Light Detection and Ranging (LiDAR) technology, extracting natural and manmade surface features.

The output, a refined Geographic Information System that incorporates the data developed under this proposal with features extracted from remotely sensed imagery.

would serve as inputs to sophisticated analyses that can be used to monitor and model goods movement and their associated impacts.

Henry Yeh, Engineering; "Survey and Identify the Needs of Port Communication Equipment for Safety. Security, and Interoperability" (AR 05-05) - One of the most difficult problems of the

Ports of Los Angeles and Long This research will conduct a Beach, observed over a long period of time, is their communications. While the development of radios and modern electronics improved and simplified that effort on one level, it also severely complicated it on yet another, i.e., interoperability between past and present products and between brands. It is worse during an emergency or crisis.

survey of communication equipment users, to identify each agency's current and near future needs.

Abstracts of these projects will soon be available on the METRANS website. For more information, contact Tom O'Brien, METRANS Applied Research Program Coordinator at (562) 296-1170.

CROWDS PACK TOWN HALL AS INDUSTRY EXAMINES PEAK SEASON

More than 1,000 people crowded into the Carpenter Performing Arts Center at CSU, Long Beach, on March 10 for the Seventh Annual Town Hall, sponsored by METRANS and the Center for International Trade & Transportation. Ranging from young longshore workers to senior shipping executives, the audience sat in rapt attention as experts discussed the paralysis of last year's "peak season" at the two local ports.

logistics jobs if the region cannot handle the increased cargo flows.

Industry experts again participated in a panel moderated by Richard Hollingsworth, President of the Gateway Cities Partnership, Inc. Their topic was, "Solutions—What Will the Industry Do So This Crisis Will Not Be Repeated in the Future?"

The panel included Dave Arian, President, ILWU Local 13; Steve Hennessey, Chief



Seventh Annual Town Hall panel listens to audience question

den, President/CEO, Marine Termianls Corp; Staci Heaton, Director of Environmental Affairs, California Trucking Assoc.; George Fetty, Rail Consultant.

Speakers called for a national goods movement and infrastructure policy to help prioritize the competing self-interest of the various stakeholders in the transportation chain. But balancing is not easy. When the ILWU hired thousands of workers for the surging cargo, the resulting explosion in truck traffic angered local freeway drivers.

Some noted that "peak season" may be an outdated term, since the traditional pre-Christmas Fall cargo volumes seem now to be threatening to be year-round volumes. Even as terminals prepare for around-the-clock operation, hoping to take the pressure off 8-to-5 workday traffic, speakers warned that truckers do not want to work nights. Signs of a trucker shortage threaten plans for 24-hour terminal operation.

While Long Beach and Los Angeles teetered on the brink of "meltdown" in Fall 2004, the fact remains they managed to handle an increase of approximately 20% in volume over 2003, and other West Coast ports acted as relief valves in absorbing overflow. Is this the transportation chain in "crisis?" Or is it simply logistics working normally?

In concluding the presentations, Genevieve Giuliano, Director of METRANS, called for more cooperation within the industry's various segments. She challenged the audience to take leadership roles in promoting collaboration between various industry players, governments, and communities affected by the river of commerce that flows in the region.



Richard Hollingsworth addresses 7th Annual Town Hall

A brief, original video documentary opened the evening, showing in dramatic footage the miles-long line of ships waiting their turn at the docks. The film was pro-

duced by CSULB's Advanced Media Production.

John Husing, Ph.D., Economics & Politics, Inc., delivered a keynote speech: "What the Logistics Industry Means for the Region." An expert on economic development and local industry, Husing emphasized the risk to good-paying Operating Officer, Pacific Maritime Association; John Ficker, President, National Industrial Transportation League, and Tom Harrold, Vice President & General Manager, L.A. Terminal, P&O Nedlloyd; Doug Til-



7TH Town Hall Presenters, from I: John Ficker, Staci Heaton, Marianne Venieris, George Fetty, Domenick Miretti, Genevieve Giuliano, Dave Arian, and Richard Hollingsworth.

METRANS Education and Training

JENNIFER RUSSELL RECEIVES NATIONAL WTS AWARD

USC doctoral candidate Jennifer Russell was recently recognized by WTS at the national level, receiving their highest academic award at the WTS National Conference in Scottsdale, Arizona.

"It was such a wonderful honor and so humbling to be considered as part of such an organization," said Russell, whose own route to the transportation industry has been somewhat unusual.

Following graduation from West Point, she spent eight years in the Army as a transportation officer, including a stint in Germany. While in Europe, her job included shipping supplies to the United Nations troops in Kosovo. Her experience there included every major transportation mode—from helicopters to tanks and trucks, to rail and ships.

Russell continues to be impressed with today's dependence on transportation, both as a vital part of our economy and an influence on our increasingly global society. On receiving the WTS National Award, she noted that she considers "WTS a source of support, nurturing, mentoring and inspiration." She thanked USC Prof. James Moore II for introducing her to the WTS organization.

As Russell contemplates her future in the transportation field,

she is eager to make a contribution. "All areas of transportation are open to women," she said. "There are no limits." Following her Ph.D., she hopes to work on transportation policy, either at the State or Federal level. "No matter how technological we be-



come, our nation will still require goods, services and consumer activities that will rely on transportation."

Her own journey has taken on new dimensions as she nurtures newborn son Monty in Leavenworth, Kansas, where her husband, Mark, is on active duty with the military.

USC Transportation Students Attend UCTC Conference

Transportation students at USC joined their peers at the 11th Annual University of California Transportation Center (UCTC) Conference in February at the Atrium Hotel in Irvine, California.

The event was hosted by the Institute of Transportation Studies at the University of California, Irvine. The student conference is sponsored by UCTC. The conference provides a forum for student research projects. This year's theme was "Signs Ahead: Emerging Themes in Transportation Research."

This year's conference was co-sponsored by METRANS, California Division of Research and Innovation, UC Irvine Graduate Program in Transportation Science, UC Irvine Center for Urban Infrastructure, and UC Irvine Institute of Transportation Studies.

Approximately a dozen USC students represented METRANS.

A highlight of the conference was graduate student presentations of their research, including topics ranging from technology and mobility to spatial and economic analysis.

USC Doctoral student Luca Quadrifoglio introduced his data on "Mobility Allowance Shuttle Transit (MAST) Services: Description, Formulation Heuristic and Viability." Ajay Agarwal, Chen Li and Duan Zhuang, also USC doctoral students, presented re-

search on "Los Angeles Regional Spatial Structure Analysis." Dr. Genevieve Giuliano, Director of METRANS and Professor in USC's School of Policy, Planning and Development, presided over the afternoon graduate student research session.

Two informal sessions were dedicated to poster presentations, during which students answered questions about their continuing research. USC graduate students offered their own posters, including transportation planning students Paul Dell'Aquila and Sara Hayden. During the session, they presented an update on their research with Dr. Gen Giuliano on truck waiting times at the Ports of Los Angeles and Long Beach after the implementation of A..B. 2650, which was intended to reduce congestion at the ports. Their research team collected data and conducted interviews over the past year and is currently in the process of writing a final report.

Other USC students who participated include:

- Alison Linder, first year Ph.D., Urban Planning;
- Mengzhao Hu, Master of Planning student:
- Xi Wang, Ph.D. student, Computer Sciences;
- Lauren Siniawer, Master of Planning student;
- Elif Karsi, Ph.D. candidate, Urban Planning.

ENO TRANSPORTATION AWARD GOES TO USC'S KENNETH HUSTING

in the Masters of Public Administration program, has been awarded an invitation to attend the Leadership Development Conference in Wash-

Kenneth Husting, USC student ington, D.C., by the Eno Transportation Foundation. The highly competitive award is given to only 20 students throughout the entire United States.

At the five-day conference in May, Husting and the other participants met with top-level administration and congressional officials responsible for

development and implementation of transportation policy. The Eno Transportation Foundation was founded in 1921 by William P. Eno to improve traffic control and safety.

Page 7 Volume 4, Issue 2

METRANS EXECUTIVE COMMITTEE

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Petros Ioannou, Professor, Electrical Engineering, USC

Joseph Magaddino, Chairman, Department of Economics, **CSULB**

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 45 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**

Mechanical, Aerospace Engineering Karl H. Grote

Mohammed Forouzesh **Health Sciences** Robert Friis **Health Sciences** Ken James **Electrical Engineering** Tim Jordanides **Electrical Engineering** Shui Lam Computer Engineering

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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.



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CSULB

WE'RE ON THE WEB WWW.METRANS.ORG

Dear Reader:

As we issue this newsletter, USC and CSULB have completed another academic year, and METRANS has completed its seventh year. Our Center continues to grow, with more faculty conducting transportation research, more students being trained for professional jobs in private industry and public agencies, and more outreach to the transportation community. In this issue you will read about some of the recent awards received by faculty, staff and students; new projects funded under our applied research program; and recent outreach events.

We are especially excited about our National Urban Freight Conference, to be held February 1–3 in Long Beach. This is a first-of-its-kind conference, focusing on metropolitan freight issues. We are soliciting papers from scholars throughout the U.S. on any aspect of urban freight, from modeling and data to environmental impacts. Please see our website for more information.

Genevieve Giuliano Director, METRANS Transportation Center

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