# METRANSNEWS

#### **METRANS** Transportation Center

University of Southern California / California State University, Long Beach

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#### Letter from the Director

METRANS, a partnership of the University of Southern California and California State University, Long Beach, is a U.S. Department of Transportation designated University Transportation Center. Its mission is to solve transportation problems of large metropolitan areas through research, education and outreach.

## Research Profiles

## NEW EARTHOUAKE TOOL HELPS "LIFELINES"

Hurricane Katrina has recently reminded us of the importance of infrastructure "lifelines"—from bridges and aqueducts to underground gas lines and dikes.

In California, however, earthquakes are a more credible threat than hurricanes. Imagine the disruption when a bridge such as the Vincent Thomas Bridge over the Port of Los Angeles is not only shaken but also permanently displaced due to an earthquake on the Palos Verdes Fault it crosses. Now, however, designers can use a new method to predict the risk of such displacement for structures crossing faults. METRANS recently sponsored Profs. Mihailo Trifunac and Maria

Todorovska of USC to develop a method to estimate the probability that displacement across the fault will exceed a certain value during the life or the service of the structure.

This could be very useful for designers, both for original construction or retrofitting. As input, the method requires information on (a) the seismic fault activity (e.g., frequency of occurrence of earthquakes, or slip rate) which can be obtained from the U.S. Geological Survey and other sources, (b) the geometry of the fault (length, width, dip angle), and (c) the location of the crossing relative to the edges of the fault.

According to Todorovska, the methodology is ready for



Prof. Maria I. Todorovska adoption and implementation for specific sites where an infrastructure "lifeline"e.g., highway, bridge, aqueduct, gas line, etc.—crosses an active fault.

Todorovska has a long interest in earthquakes. "I was

(Continued on page 2)

## NEIGHBORHOODS PREDICT RESIDENTS' COMMUTES

While urban planners may dream of designing selfcontained neighborhoods where residents use public transit or walk, Peter Gordon is skeptical. His own research suggests that it's not so simple.

In a recent METRANS-funded study. Gordon and his coauthors found that physical attributes of the neighborhoods-such as age and density of the building stock, street spacing, street pat-



Prof. Peter Gordon (left)

terns, access to freeways, etc.—explain significant variance in residents' commuting times. These findings apply to neighborhoods in the four

largest metropolitan neighborhoods in California. and they held true beyond simple density measures. A similar finding holds true for jobsite neighborhoods-i.e., the infrastructure amenities of commercial or industrial sites attract longer commutes.

Not unexpectedly, denser neighborhoods had longer commutes. What distin-

(Continued on page 2)

## Page 2 METRANS Research

## LEGISLATION RE-AUTHORIZES METRANS FUNDS

Passage of the massive \$286 billion Federal Transportation Bill, SAFETEA-LU, last summer was good news for METRANS. Under the University Transportation Center (UTC) research program, METRANS was included as one of 10 Tier 1 UTCs.

According to Genevieve Giuliano, METRANS Director, "The legislation provides for continuation of the existing Tier 1 UTCs through 2006, but they are subject to an open competition to be completed by June 2006. Ten winning centers will be selected for funding through 2009." She is optimistic about the competition. "We expect to be successful in 2006. We were successful in 2002, despite being a new UTC with only

three years of a track record. Since then we have expanded our research, education and outreach programs; we have an impressive performance record with respect to the goals of the UTC program as established by US-DOT." Caltrans has already committed to the required dollar-for-dollar match through 2009. Giuliano cites the Caltrans match as an important factor in allowing METRANS to develop a cohesive research program.

Giuliano attributes the success of METRANS to four strategies: focus, coordination, cooperation, and responsiveness. All METRANS activities are focused around a few topical areas, with goods movement and international trade the single large-

est area. Research, education and outreach are coordinated so that research is part of the educational experience, and research is moved to practice through outreach. Cooperation and collaboration are essential for successful interdisciplinary research across several schools and two universities. Finally, METRANS is committed to being responsive to both its sponsors and industry stakeholders.

Emphasizing goods movement in research and having a rich mix of outreach makes METRANS somewhat unique, partly why METRANS is increasingly visible in the transportation community. "Our goal now is to be recognized as one of the top centers nationally," she said, "and

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our National Urban Freight Conference is part of the strategy to achieve this goal" (See above.)

## EARTHQUAKE TOOL, CONT.

(Continued from page 1) born in Skopje, then in former Yugoslavia, which was devastated by earthquake in 1963." she said. "I was an undergraduate physics major, but due to that event, I decided for graduate studies to specialize in earthquake engineering. Damage to lifelines can kill and injure people, disrupt function, and cause large monetary losses. This problem is very relevant for California, as well as for other parts of the world."

To alert designers about this new tool, the two researchers plan to present it at the 8th National Conference on Earth-



quake Engineering to be held in San Francisco next year, which coincides with the anniversary of the 1906 San Francisco earthquake. Todorovska already presented it at a conference in Skopje recently and at a seminar at the Earthquake Research Institute of Tokyo University. Both Todorovska and Trifunac were recently named among the Top 20 Authors for their earthquakerelated research by Thompson, ISI, publisher of Web of Science and the Essential Science Indicators rankings.

Caltrans has already expressed interest. Todorovska has sent a copy of the report to the Federal Highway Administration, and the report may appear soon in a refereed engineering journal.

## NEIGHBORHOODS, CONT.

guishes the research is that the "composite neighborhoods" predicted commuting times above and beyond the simple density measure.

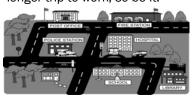
Neighborhood types ranged from classic urban to sprawling suburban.

Collaborating with Gordon were Bumsoo Lee and Harry W. Richardson, of USC's School of Policy, Planning, and Development and Department of Economics: James E. Moore II of the Departments of Civil and Industrial Engineering, as well as the School of Policy, Planning and Development; and Richard Moore, of the Geography Department. The multi-disciplinary team gathered neighborhood physical patterns from the four California metropolitan areas using Geographical Information Systems (GIS) technology. This included

the 2000 TIGER® (Topologically Integrated Geographic Encoding and Referencing system) street networks files to measure street design factors, and GIS map files of rail transit lines and freeway access. The U.S. Census supplied commuter work-trip data and certain housing-tract infor-

mation.

"Many households trade off desirable neighborhood characteristics (at home and/or at work) for a longer commute," explains Gordon. While expensive neighborhoods may represent the extreme of low commute times, he says "There are some 'happy mediums' along the way where people say 'This fits me, and if it means taking a longer trip to work, so be it.'"



## LATEST METRANS RESEARCH REPORTS ISSUED

The following METRANS research reports are now available via our website, www.metrans.org.

## 04-13 DO NEIGHBOR-**HOOD ATTRIBUTES AFFECT** COMMUTING TIMES?

Peter Gordon, Bumsoo Lee, and Harry W. Richardson, School of Policy, Planning, and Development and Dept. of Economics; James E. Moore II, Dept. of Industrial and Systems Engineering and Dept. of Civil Engineering and School of Policy, Planning, and Development; Richard Moore, Geography Dept, University of Southern California.

Can generic neighborhood types for California's major metropolitan areas be defined? To what extent do neighborhoods affect commuting times? Using census data, including TIGER file variables that describe street patterns and transit and highway accessibility, we found that there are identifiable residential as well as workplace neighborhood types observable throughout the four maior California metropolitan areas.

We also found that many of these had consistent effects on commuting durations across the four areas. In most cases, neighborhood effects helped to explain a longer commute than could be explained by a generalized accessibility index. Many households trade off desirable neighborhood characteristics (at work and/or at home) for a longer commute. All things considered, jobs-housing "balance" is, apparently, not high on most people's agendas.

## 00-12 Freeway Bus Station Area Development: Critical Evaluation and Design Guidelines, A Case Study of (I-110) Harbor Transitway Stations

Tridib Banerjee, Depak Bahl, Shahab Rabbani, and Abhishek Mamgain, School of Policy, Planning and Development; Sukriti Agarwal, Lusk Center for Real Estate; and Haiyan Yu, School of Policy, Planning and Development, University of Southern Califor-

Transit centers can become more than just a place for transportation. They can serve as destination places that accommodate a diversity of uses and activities which promote transit use. Their location, quality of design, supporting amenities, and other development attributes can influence ridership. In this project, we use Harbor Transitway as a case study to assess the place-based qualities of freeway transit centers with respect to amenity mix, appearance, access, comfort, convenience, security, business development opportunities, and pedestrian and parkand-ride linkages. In addition, we identify transit user needs and perceived gaps in services through surveys and interviews to develop broad performance measures of station area interface with the neighborhood and transit user needs. Our research suggests that Harbor Transitway station areas are not used efficiently or effectively. Some of the major problems cited by transit users include irregularity in bus service, inconvenient bus transfers, insufficient public amenities, lack of public art,

narrow sidewalks, unsafe crosswalks, high noise levels, poor station area maintenance, insufficient lighting, and perception of insecurity of

## The **2004-05 METRANS Annual Report** is now available at: www.metrans.org

waiting alone at the station. To increase transit ridership, we make design recommendations and suggest ways to improve linkage between land use, transportation, and surrounding communities.

## 03-24 Increasing Bus Transit Ridership: Dvnamics of Density, Land Use, and Population

Tridib Banerjee, Dowell Myers, Clara Irazábal, and Deepak Bahl, School of Policy, Planning and Development, University of Southern California.

The study explores the possibilities of revitalizing existing urban communities, increasing transit ridership, decreasing jobs-housing imbalance, and mitigating the impacts of sprawl from transit corridor development or TCD, a variant West Coast, East Coast, and of the more general class of TOD or transit-oriented development. We present findings of a study that focuses on the relationship between transit ridership and density and mixed land use developments along major arterial corridors in Los Angeles. Our research focuses on Ventura Boulevard and Vermont Avenue as a comparative study of two heavily subscribed transit cor-

ridors. Our analysis suggests that the predominant land use around these corridors is lowdensity automobile-oriented development which remains transit-unfriendly. However, the City's policy environment has undergone favorable changes with the introduction new zoning ordinances. In light of these changes, we develop and recommend spatial and urban design strategies that productively utilize surplus, marginal space along transit corridors to accommodate future growth. It is our expectation that densification of underutilized commercial corridors will create vibrant local economies, increase opportunities for market and affordable housing, revitalize retail, and lead to fuller use of transit lines and increased ridership, a trend now observed in higher density bus station areas.

## AR 04-02 Labor at the Ports: A Comparison of the **ILA and ILWU**

Kristen Monaco and Lindy Olsson, Department of Economics, California State University, Long Beach.

While longshore workers retain a wage premium over others in blue-collar occupations, there are differences in wages and work rules on the Gulf ports. This paper examines the differences by, first, analyzing the different evolutions of labor-management relations in the two unions and, second, using micro data on wages to measure the advent of and extent of divergence between the two groups since 1984. We conclude with an explanation of sources of this divergence and the likely future trends.

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#### METRANS Research

## NEW CSULB ECONOMIST'S RESEARCH WILL ALLEVIATE FREEWAY CONGESTION

Seiji Steimetz has recently joined the ranks of the faculty at California State University, Long Beach, as a transportation economist. The recent University of California, Irvine, graduate specializes in congestion pricing. If "congestion pricing" does not mean anything to you, consider "How much would I pay to avoid a traffic jam?"

Although Steimetz began his post-doctoral career as a consultant, he remarked that the CSULB position "was the only position that could have pulled me out of consulting, especially due to the MAGL (M.A. in Global Logistics) affiliation. I am thrilled to be here."

In teaching his MAGL classes, Steimetz expects the learning to go both ways, since the



majority of the students are working in the logistics field. He finds them "extraordinary."

Steimetz' career has taken him on more than one unexpected turn. While studying Urban Economics at San Jose State University, the Berkeley native read Kenneth Small's work on urban transportation. "I was fascinated." He subsequently studied under Small and David Brownstone at UCI. His dissertation concerns the I-15 Pricing Project from the San Diego area, demonstrating how people assign a monetary value to travel time and road density reductions.

Steimetz hopes his research will guide roadpricing to achieve reductions in traffic flow on congested highways everywhere.

## See the NEW

## METRANS website: www.metrans.org

### Easier Access to:

- Comprehensive Research Listings
- **Education Programs**
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- Newsletters and Updates
- Other Transportation Resources
- Much, much more

## Prof. Randolph Hall Named USC's Vice Provost for Research Advancement

METRANS founding director Randolph Hall was recently named Vice Provost for Research Advancement at USC. He took over in June.

Though many would consider helping to found a center such as METRANS to be a capstone career event, for Hall it was a prelude to even more interdisciplinary and multi-university research.

In 2003 he helped found the Center for Risk and Economic Analysis of Terrorism Events

(CREATE), which was the first university center of excellence selected by the Department of Homeland Security after a competition among 72 universi-

ties. Hall's interdisciplinary and multi-university experience have given him a unique perspective on the needs of



County Department of Health Services to improve healthcare delivery at County-USC Medical Center.

researchers and society's need for their research.

from University of California, Berkeley, Hall is formerly the chair of the Daniel J. Epstein Department of Industrial and Systems Engineering, During his tenure as chair, the faculty grew by 50% and was the first USC named department, upon receipt of a gift of \$10 million from Daniel J. Epstein.

Having received his Ph.D.

Hall has also written or edited books in several fields. His research ranges from security issues to patient flows in health care systems.

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#### METRANS Education

## FESTIVITIES TO GREET NEW AND GRADUATING MAGL CLASSES AT CSULB

A mixer will greet the newest students of the M.A. in Global Logistics class on October 21 at California State University, Long Beach.

Alumni and instructors will gather at the Earl Burns Miller Japanese Garden on the CSULB campus from 5:00 – 8:00 p.m.



Earl Burns Miller Japanese Garden at CSULB

Twenty-eight students have joined the fourth cohort class of the MAGL, launched September 12 on the CSULB campus, according to Nathalie Ho, Program Administrator. They constitute the largest class to date.

Meanwhile, the third cohort class is finishing their studies, planning to graduate on December 5. Ten graduates are expected to complete the program, and one will be awarded the \$5,000 Port of Long Beach scholarship, retroactively, at the graduation.

Alumni, instructors, and students wishing to attend the MAGL mixer should notify Dr. Joe Magaddino at (562) 985-5061.

## USC Transportation Alum Finds Variety at Parsons Brinckerhoff

"Like everyone else in Los Angeles," says USC Transportation alum Stephanie (Tessie) Roberts, "I'm trying to buy a house!"

Fortunately, she brings some extra credentials to the task of house-hunting. First, as a former want-to-be architect, she can better judge the aesthetics of prospective homes. As a transportation planner, she can assess the entire neighborhood for its accessibility. Now that she's working fulltime, chances are high she can better afford it, too. "I've been lucky," says Roberts.

Self-Improvement. Her drive to improve and excel did not stop when she graduated from USC in 2000 with a Master's degree in Planning and a Certificate in Transportation Systems. She recently passed the Professional Engineer exam and is currently enrolled in Toastmasters to improve her public speaking.

She has found the job that uses her wide range of talents—ranging from drawing to math. As a Senior Civil Engineer and Transportation Planner for Parsons Brinckerhoff (PB) in downtown Los Angeles, Roberts finds every day different.

Currently she is working on a study in Salt Lake City. The project involves evaluating transportation into and out of the downtown area, including freeways and light rail.

Metro Gold Line Project. An even larger project she's assigned to involves the Metro Gold Line Light Rail Transit Foothill extension. As Deputy Project Manager for the extension project, she is working with Tom Jenkins. "He is legendary

in the industry," she remarked. Working with Jenkins allows her to continue a tradition of excellent mentors. "Amazing mentors," in her words, have always taken an interest in her career. She appreciates it.

Among that group of mentors, Roberts counts both Profs. Genevieve Giuliano and James Moore II in her USC Masters program. "They are still active in my life in that I know I can call them for help at any second. They will help in any way."

That loyalty goes both ways. Roberts notes that she would

be happy to offer assistance if her former professors phoned her when someone needs it.

She gives back to the community, too. "I have been

active in WTS (formerly Womens Transportation Seminar) since 1999, when I won a scholarship from them, and have been a Board Member since 2001. I'm currently Co-Chair of the Mentoring Committee."

Convinced she would use her artistic skills to be an architect, the Bucknell Engineering undergraduate was convinced by a pivotal professor to continue her planning interests instead in the transportation field.

"Every single person on this earth is affected by transportation," she says, "be it walking, hopping, driving, biking, riding a train or flying. I like knowing that I'm working on projects that address issues that affect so many people." Her current job at PB gives her the chance to combine both the technical aspects of her engineering background with her creative side.

Experience Abroad. As an exchange student, Roberts studied in both Denmark and New Zealand, where she met some of her lifelong friends. She recommends taking the chance to study abroad, even if it means spending an extra semester at school. Such experiences, she feels, will influence the student throughout life.

Roberts' career journey is not yet complete, and she is not sure where she wants it to end. For now, she's enthused about the career path of project management at PB. She looks forward to the day when she will have full responsibility for major projects of her own.

A winner of PB's "Emerging Professional" award last year, this year she herself ran the worldwide Emerging Professional Paper Competition. She explained that this year's winners are from Australia. "They will come to New York, PB headquarters, where we'll give them the award."

Amid all that activity, will she have time to find that new home she dreams of? Chances seem high that Tessie Roberts will find the time to do whatever she really wants to.

## USC STUDENTS, NEW GRADUATES GARNER AWARDS

USC's planning and engineering students continued the METRANS tradition of award-winning performance in several different arenas recently.

Dooil Hwang, Ph.D. candidate in USC's Daniel J. Epstein Department of Industrial and Systems Engineering, received top honors from the Institute of Industrial Engineering, Construction Division, for the best 2005 student paper. Presenting his paper in May, Hwang also received a cash prize of \$1,500 plus travel expenses. Hwang's submission describes Contour Crafting, or CC technology, which adapts Rapid Prototyping capabilities and extends them to the field of large-scale construction.

The technology will help the construction industry improve productivity, quality, and safety in light of skilled labor shortages at construction sites. The CC approach has been

demonstrated in feasibility tests in which it was used to construct large concrete structural components. Automation in the construction industry may be truly feasible if CC becomes widely accepted. Hwang's advisor is Professor Berok Khoshnevis.

**Sara Hayden**, new Master of Planning graduate from USC, has been saluted again. This time she received the American Planning Association's award for Outstanding Attainment in the Study of Planning, the Certificate of Merit for Outstanding Master's Candidates, and the MPL Comprehensive Examination Prize.

Meredith Fant, Master of Planning graduate, received the Gordon Whitnall Outstanding Academic Achievement in Planning award. Whitnall founded the Los Angeles City Planning Association and in 1920 established the Los Angeles City Planning Department. He later became a professor of planning at USC.

In addition, Fant received the Certificate of Merit for Outstanding Master's Candidates and the MPL Comprehensive Examination Prize.

**Michael Hogan**, Bachelor of Science in Industrial and Systems Engineering, was awarded the Viterbi School of Engineering Alumni Advisory prize for Outstanding Achievement in

Leadership. The award is given each year to the Viterbi School of Engineering senior who has distinguished himself or herself as a leader supporting the objectives of the School, the University, and the profession. Students are nominated by their departments, and Hogan was nominated after winning the Epstein ISE Department's Outstanding Student Award for 2005. He will continue his studies in the Epstein Department as a. M.S. student in Systems Architecture and Engineering.



## You are invited to join the Fall METRANS Seminars

USC Campus: Ralph and Goldy Lewis Hall, Rm. 209
CSULB Campus: CSULB Foundation, 6300 State University Drive, Suite 204

12:00 - 1:30 p.m.

- October 17 "The Labor Market For Port Truckers In Southern California," by Professor Kristen Monaco, Department of Economics, California State University, Long Beach; at CSULB Campus
- October 19 TBA, Professor Anastasios Chassiakos, Electrical Engineering, California State University, Long Beach, and Professor Petros Ioannou, Department of Electrical Engineering Systems, University of Southern California; at USC Campus
- November 11 "The Planning Challenge Of An Aging Society; If You're Not Part Of The Solution, You're Part Of The Problem," by Professor Sandra Rosenbloom, Department of Geography, University of Arizona; at USC Campus
- November 30 "Operational Improvements To Port Productivity: The Challenge Of Many Players," by Anne Goodchild, Ph.D. Candidate, Civil and Environmental Engineering, University of California, Berkeley, at USC Campus

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## METRANS EXECUTIVE COMMITTEE

Genevieve Giuliano, Director

Professor, School of Policy, Planning, & Development, USC

Marianne Venieris, Deputy Director

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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

Karl H. Grote Mechanical, Aerospace Engineering

Mohammed Forouzesh
Robert Friis
Health Sciences
Comparison of the sciences
Health Sciences
Health Sciences
Health Sciences

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Health Sciences

Christopher Lee Geography
Joseph Magaddino Economics
Kristen Monaco Economics
Emily Parentela Civil Engineering

Hamid Rahai Mechanical Engineering
Jalal Torabzadeh Mechanical Engineering

Suzanne Wechsler Geography

Henry Yeh Electrical Engineering

#### **University of Southern California:**

Tridib Banrjee Policy, Planning, & Development Industrial & Systems Engineering Satish Bukkapatnam Maged Dessouky Industrial & Systems Engineering Michael Driver **Business Administration** Genevieve Giuliano Policy, Planning, & Development Peter Gordon Policy, Planning, & Development Industrial & Systems Engineering Randolph Hall Le Dam Hanh Civil Engineering John Heideman Information Sciences Institute Petros Ioannou **Electrical Engineering Systems** Clara Irazabel Policy, Planning, & Development Civil Engineering Erik Johnson Behrokh Khoshnevis Industrial & Systems Engineering John Kuprenas Civil Engineering Naj Meshkati Civil Engineering ISE, CE and PPD James E. Moore II **Dowell Myers** Policy, Planning, & Development Fernado Ordonez Industrial & Systems Engineering Kurt Palmer Industrial & Systems Engineering Mansour Rahimi Industrial & Systems Engineering Christian Redfearn Policy, Planning, & Development Harry Richardson Policy, Planning, & Development **Paul Ronney** Mechanical Engineering Maria I. Todorovska Civil Engineering Mihailo D. Trifunac Civil Engineering

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## METRANS WEBSITE

Niraj Verma

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.

Geography

Civil Engineering

Policy, Planning & Development



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CSULI

## WE'RE ON THE WEB WWW.METRANS.ORG

#### Dear Reader:

At long last, the new federal transportation reauthorization bill, SAFETEA-LU, has been signed into law, and METRANS has been included as a "Tier 1" University Transportation Center. We must once again compete to retain our funding and designation through 2009, and I am confident that we will again succeed. Caltrans has graciously committed to provide the required dollar-for-dollar match funding. We are grateful for their continuing support. We look forward to continuing and expanding our work in goods movement, urban mobility, infrastructure, and safety and security.

Genevieve Giuliano Director, METRANS Transportation Center

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