



**METRANS CENTER
SEMI-ANNUAL REPORT**

**University of Southern California
California State University, Long Beach**

2004-2005 FISCAL YEAR

January 31, 2005

INTRODUCTION

This Semi-Annual report marks the beginning of METRANS' seventh year. Federal funding is the result of continuing TEA-21 funding for an additional year. The California Department of Transportation continues to provide a full match. Uncertainties of reauthorization have delayed funding and hence center activities.

RESEARCH: Our research program has shifted to a mid-year schedule due to delays in funding in earlier years. FY 2003-2004 research projects began in February 2004, most have end dates of 1/31/05. Nine projects were funded for 2003-2004 under the regular RFP process, and two projects were funded under our new applied research program. The 2004-2005 RFP was issued 8/24/04, and 9 new awards were made in January 2005. Several of these will have later start dates due to delays in receiving Caltrans funding and to our requirement that existing projects be completed before new projects can be started. We issued an RFP for the applied research program in December 2004; pre-proposals were received 1/28/05. Full proposals on selected projects will be due in March, for a funding start date of June 2005. METRANS continues to attract new faculty to transportation research; the total number of faculty associates is now 41.

EDUCATION: The GLS-Online program was launched as planned in May 2004. Three cohorts of students (26 total) are now enrolled. GLS-Online is based on the Global Logistics Specialist program offered through the Cal State Long Beach extension program and the Center for International Trade and Transportation (CITT). The online program is a response to demand; the GLS program has limited capacity and is offered in only one physical location, yet there is demand for such training throughout California and the US. METRANS is also providing a 2.5 day training program on goods movement and international trade for Caltrans personnel. Two workshops will be held in April 2005, one each in the north and south of the state.

OUTREACH: METRANS continues to support the outreach activities of the CITT at Cal State Long Beach. A seventh Town Hall meeting is now in the planning stages and will take place March 10, 2005. The METRANS Annual Conference will take place in February 2005, in conjunction with the annual METRANS Advisory Committee meeting. This year METRANS is assisting Caltrans in the development of a Virtual Weight and Compliance Station concept; a stakeholder workshop will be held in February 2005.

METRANS has made significant progress in research, information dissemination, and education in the first half of the fiscal year. As always, METRANS continues to expand activities, increase its visibility, and fulfill its three-part mission.

A. Success Stories:

Planning for METRANS Annual Conference to be held on February 9, 2005

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In the fall of 2004, METRANS began planning for its next annual conference to be held on February 9, 2005. The main purpose of the METRANS research conference is to share research results with the Southern California research and practitioner community. This year's conference is titled "Mobility in the Metropolis: Making the Most of What We Have" and highlights the results of recent METRANS research on improving the productivity of both goods and passenger transport. The productivity of the transportation system has become increasingly important as growing demand for transport of people and freight has far exceeded growth in transport capacity.

The conference, to be held at the USC Davidson Center, will be divided into two afternoon sessions, each with three different presentations. The first session looks at planning and decision making for highway investments including modeling for highway widening, network transportation flows, and cargo movements. The second session focuses on increasing efficiency of the transport system and addresses the wages and working conditions of truck drivers, feasibility of short sea shipping, and small container freight routing. After the presentations, 6 additional METRANS research projects will be featured in a poster demonstration session.

The 2005 METRANS Research Conference is being planned in conjunction with the annual METRANS Advisory Committee meeting. The latter will be held on the morning of February 9 on the USC campus. Combining the two allows Committee members to meet METRANS researchers and better learn about their work.

Save the Date cards for the Annual Research Conference were mailed to the master database in December, 2004. Key participants were identified and contacted. Invitations were mailed in early January and placed on the METRANS website. An announcement was also widely circulated to faculty members and students on both the USC and CSULB campuses.

**Planning for Seventh Annual CITT State of the Trade and Transportation Industry
Town Hall Meeting to be held March 10, 2005**

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The Annual Town Hall meetings offer goods movement stakeholders, particularly longshore labor, an opportunity to discuss the issues most critical to port operations. During 2004, no other issue was more critical than the congestion experienced by the ports beginning in the late summer and continuing throughout fall and the Christmas season. The congestion was part of a worldwide phenomenon but particularly acute in Southern California whose ports handle roughly 40% of the goods entering the US. The heightened activity affected all segments of the supply chain, resulting in delays and ship diversions. There is a general consensus that the 2004 crisis was not an isolated incident; rather it reflects the vulnerability of the supply chain to disruptions caused by any number of factors, including increased demand for goods and a trend toward larger ocean-going vessels. There is a fear that the events of last year will be repeated in 2005.

As a result, the Seventh Annual Town Hall will address "Lessons Learned from the 2004 Peak Season Crisis: Causes, Impacts, Solutions." It will be held on March 10, 2005 at the Carpenter Center on the CSULB campus. This year's panelists represent the port/marine terminals, trucking and the railroads, retailers/shippers and ILWU labor. The objective is to discuss the response of goods movement stakeholders to the unprecedented volumes of cargo moved through the ports during the summer and fall of 2004, and the adjustments being made for the future. The forum will also explore whether international trade flowing through the ports of Long Beach and Los Angeles can continue to grow unabated without imposing negative impacts on communities.

To begin the evening's discussion and set the framework for issues debated, a video will be produced by CSULB's Advanced Media Production unit. The video will set forth the causes and impacts of goods movement congestion, allowing the panelists to focus on solutions that may benefit all stakeholders. It will have a shelf life after the meeting as an informational resource for governmental agencies and concerned community groups.

A companion White Paper will provide an overview of the issues surrounding port congestion and summarize the Town Hall debate. It is expected to be released in the summer of 2005 and will be posted on the METRANS and CITT websites. The 2004 Town Hall White Paper was widely disseminated to goods movement stakeholders and the press. Both the 2004 video and the White Paper will be presented at a USC-sponsored forum on health and the ports in February 2005.

Given the importance of the topic, the 2005 Town Hall is expected to attract more than 1000 industry and community stakeholders. The proceedings will be web-cast and made available on the Internet, where it will be archived for at least one year at www.uces.csulb.edu/citt. The Town Hall has been endorsed by more than 25 trade associations and public organizations.

Global Logistics Specialist Online Training

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The highly successful Global Logistics Specialist Professional Designation Program (GLS®) offered through the Center for International Trade and Transportation (CITT) at California State University, Long Beach, has been converted into an on-line, web-based version. The online course developers at CSULB Integrated Distance Education for Adult Students (IDEAS) division worked with the same highly-qualified course instructors and subject matter experts who have offered the traditional GLS program to convert this rigorous 118 hour program. The goal of the GLS Online program is to meet the ever increasing demand for a well-trained workforce pool nationwide.

Following an extensive marketing campaign, Module One, *Overview of Global Logistics and Supply Chain Management*, started on June 9th 2004 and was repeated on July 28th 2004 with a total of 16 students. Seven of these continued with Module 2, *Follow the Freight: Process, Partners, Documents and Decisions*, that run from 8/18/04 through 10/26/04. Module 3, *Legal, Financial, and Risk Management issues in Global Logistics* run from 11/17/04 through 12/14/04 with eight students. In January, Module 4, *World Trade & U.S. Customs: Regulations, Policies & Supply Chain Security Issues*, and in February, Module 5, *Trends in Infrastructure & Technology*, will be offered.

The entire program concludes on April 5th 2005 with a Capstone Project. The students work in virtual teams to complete this project. Deliverables for the Capstone Project include a written logistics plan and an oral presentation (using virtual meeting software) given in a real time virtual meeting over the Internet.

We collected student evaluations after each Module. These, together with a detailed assessment submitted by the program facilitator and the industry experts who participated in the virtual classroom, gave us a good measure of the inaugural classes. As a whole, they were very pleased with the results and the lessons learned and suggestions will be implemented for the next round of classes.

The total number of students who enrolled in the new GLS Online program by December 31, 2004 is 26. We attracted a diverse student body working for various industry segments such as US Customs and Border Control, Schneider Logistics, Marine Surveyors, Port of Long Beach, Northwest Texas International Trade Center and FHWA.

They sign-in from Wisconsin, Maryland, Utah, North Carolina, Washington State, Arizona, California and Vietnam.

We received enthusiastic feedback from our students and the industry experts who worked with the course facilitator to provide a successful and rewarding learning experience. Some of these testimonials are posted on the website and listed in our program brochure.

To attract more students to the online program, a nationwide marketing campaign will be implemented in Spring 2005. This includes ads in publications for Food Logistics, Inbound logistics, Journal of Commerce, and publication distributed in areas with major distribution centers. The marketing plan also includes direct contact with national retailers and manufacturer that import and export through the Long Beach/Los Angeles Port complex. We will also contact various planning agencies in California.

Building Bridges Newsletter

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The *Building Bridges* newsletter has gained on popularity since we began publication in January, 2001. It is distributed to stakeholders in the trade and transportation industry and members of the community. The majority of hard copies, about 2000 are distributed to the International Longshore and Warehouse Union (ILWU) local members, 250 copies are mailed and over 75 are emailed to industry leaders and the trade community. In addition, the newsletters are made available at the Town Hall meetings, at trade association meetings, and via the METRANS and CITT websites.

Building Bridges is a briefing document intended to inform and promote dialogue within the maritime/logistics industry community.

The objectives are:

- To provide a neutral communications channel on industry issues
- To lead to fruitful and open dialogue
- To encourage closer cooperation among all industry stakeholders

The newsletter is formulated, edited and distributed by an Editor-in-chief. An Editorial Board, including members of the subcommittee and the METRANS Director, provides oversight. The July, 2004 issue featured articles on the record high diesel fuel prices and its affect on California truckers, the 6th Annual CITT State of the Trade and Transportation Town Hall meeting, and on the White Paper, *Quality of Life and Port Operations*, that resulted from the 6th Annual Town Hall Meeting. It also contained articles on the CITT executive seminar that helps to assess supply chain vulnerability and

three \$5,000 scholarships from the Port of Long Beach for students of the Master of Arts in Global Logistics.

***METRANS NEWS* Newsletter**

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METRANS NEWS is a newsletter that summarizes METRANS research, education and information dissemination activities. The newsletter complements the METRANS website and is intended to broaden our exposure to the research community, government, and industry. The newsletter offers regular features on METRANS research, education and outreach activities. It was launched in 2003, and issues were published in February, June, and November. The November, 2004 issue featured a research profile on METRANS researchers who have examined the potential of bus transit corridors for higher density, infill development. Other articles featured METRANS' Annual Report, the sixth annual CITT Town Hall, two awards won by a USC planning student, the new Global Logistic Specialist program available online, success stories from graduates of the MAGL (Master of Arts in Global Logistics) program at CSULB, and a feature on one of USC's MPL alumni. The newsletter is distributed to the national research community, federal, state and local leaders, industry leaders, and federal, state and local transportation agencies. The newsletter is also posted on the METRANS website.

METRANS Web Page: www.metrans.org

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The following reflects the additions and updates for METRANS websites from July 2004 through December 2004.

Items Added

- A) Building Bridges Quarterly Newsletter
- B) 04-03, Evolution of Collective Sensory Systems for Intelligent Vehicles

- C) 04-04, Landside Surface Transportation Impact of Short Sea Shipping in Southern California
- D) 04-05, Development of Methods for Handling Empty Containers with Applications in the Los Angeles/Long Beach Port Area
- E) 04-06, Evaluation of the Terminal Gate Appointment System at the Los Angeles/Long Beach Ports
- F) 04-08, SURE-SE: Sensors for Unexpected Roadway Events: Simulation and Evaluation
- G) 04-09, Reduction of Construction Project Risks to Pedestrians, Drivers, and Transmit Passengers Through Analysis of Historical Accident Records
- H) 04-13, What can we Learn from CTPP 2000?
- I) 04-15, Confidence Intervals for Estimated Traffic Demand
- J) 04-18, Transit Investment & the Capitalization of Access into Land Values
- K) 03-01, A Novel Approach to Routing and Dispatching Trucks Based on Partial Information in a Dynamic Environment
- L) 03-23, Improved Modeling of Network Transportation Flows, Including Land Use-Transportation Interactions:
- M) 03-27, Methodology for Probabilistic Assessment of Permanent Ground Displacement Across Earthquake Faults for the Transportation System
- N) 01-2, Reducing Pollutants from Mobile Sources Final Report
- O) 00-11, Investigating the Role of Driver Styles in Highway-Rail Crossing Accidents
- P) Draft Final Report for 03-01, A Novel Approach to Routing and Dispatching Trucks Based on Partial Information in a Dynamic Environment
- Q) 2004/05 Request for Proposal
- R) Final Report for 00-7, Adsorption Air-Conditioning for Containerships and Vehicles
- S) Fernando Ordonez, Karl Grote, Dowell Myers, Maria Todorovska, and Mihailo Trifunac to the Researcher Directory and linked them to their projects
- T) Final Report for 01-10, Parametric Frequency Domain Identification Using Variable Stiffness and Damping Devices
- U) White Paper: Quality of Life and Port Operations: Challenges, Successes and the Future
- V) Final Report for 03-01, A Novel Approach to Routing and Dispatching Trucks Based on Partial Information in a Dynamic Environment
- W) Draft Final Report for 03-20, Neighborhood Attributes and Commuting Behavior: Transit Choice
- X) October 2004 issue of METRANS News
- Y) Final Report for 03-20, Neighborhood Attributes and Commuting Behavior: Transit Choice

Items Updated

- Z) Archived 1999, 2000, and 2001 Project Summaries
- AA) Moved old events to the “Past Events” page
- BB) Key Personnel
- CC) Publications Style Guide
- DD) METRANS Semi-Annual Report of updates
- EE) University of Idaho’s logo on UTC’s page

UTC Search Engine

- FF) Update Page count / websites on a regular basis
- GG) Re-index UTC web sites to add new pages on a regular basis
- HH) Correct and add links for UTC web sites
- II) Problem solved sites with low page counts
- JJ) Support Foxpro program which calculates the total page counts
- KK) Raise page count for sites with large page counts
- LL) Create check request and forward invoice for payment

Domain Name (Network Solutions) and ISP Maintenance (Active Host)

- MM) Create check request and forward invoice for payment
- NN) Verify payments are submitted and received
- OO) Problem solve issues (e.g. Billing and Connectivity)

As of January, 2005, METRANS.ORG had about 61,300 hits on the home page.

Planning for the METRANS web site overhaul

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METRANS' existing website was developed six years ago and it is showing its age. We have recognized the opportunity to upgrade the website by taking advantage to recent Internet and web technologies. Beginning in spring 2005 the current site will be redesigned and upgraded to not only enhance the visual presentation of the site and the ability to find and use METRANS research, but also to streamline the process of adding new content and upgrading existing content. The new design will also enhance METRANS' use of the Internet for marketing and outreach. We plan to launch an "e-newsletter" version of METRANS News, as well as special sections to highlight the integration of our activities in goods movement and international trade.

METRANS Advisory Committee

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The METRANS Advisory Committee is made up of private industry leaders and federal, state and local public agency representatives. The purpose of the Committee is to provide general policy guidance on METRANS activities. We have changed the Advisory Committee meeting to an annual meeting held in conjunction with the METRANS Annual Conference. We experimented with this format last year, and it was most successful. It gives members the opportunity to participate in the Conference and hear about our research results. Since some members reside outside Southern California, an annual meeting also reduces the travel burden.

The 2003-4 Advisory Committee meeting was held February 10, in conjunction with the Annual Conference. Nineteen members attended. The agenda included short research presentations from ongoing projects, as well as an introduction to students who had won national awards in the previous year. The meeting was followed by a half-day conference entitled "Alameda Corridor: Blueprint for the Future?" About half of the Advisory Committee members attended the conference.

The 2004-5 Advisory Committee meeting will be held February 9, 2005, again in conjunction with the Annual Conference. This meeting will be devoted to an assessment of our current activities and a discussion of future directions. Topics will include research focus areas, achieving national prominence, future conferences, and future funding.

Research

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By the end of the 2003-2004 Fiscal Year, METRANS had issued five research RFPs, and had funded a total of 51 research projects. As of July 1, 2004, 24 projects were completed (final reports approved and published), 5 projects had draft final reports submitted and under review, 22 projects were in progress, including the 9 new projects awarded for 2003-4. One project from 1998-99 has been cancelled for lack of completion. By December 31, 2004, 28 projects were completed, 5 draft reports were under review or revision, and 18 projects were in progress.

The RFP for FY 2004-2005 was issued August 24, 2004. Proposals were due October 15, 2004. METRANS received 20 proposals from 31 faculty representing 13 departments and requesting a total of \$1.5 million. Proposals were reviewed by academics, practitioners, and government agency representatives from throughout the United States. The METRANS Executive Committee met in December 2004 to evaluate and prioritize proposals. 9 projects were selected and approved by Caltrans for total funding of about \$800,000. Most projects will begin February 1, 2005, pending receipt of Caltrans funding.

A second RFP for our Applied Research program, *Monitoring the Ports*, was issued in December 2004. The purposes of the Applied Research Program include promoting and supporting CSULB faculty research and developing an information base of seaport operations and goods movement. Proposals are solicited in the following topical areas:

- Productivity of port operations, including labor, terminal operations, institutional issues
- Goods movement within the Los Angeles region
- Documentation and evaluation of goods movement related regulations or policies
- Documenting impacts of goods movement, including congestion, traffic safety, air quality

The proposal submission requires a short preliminary proposal. The most promising and relevant pre-proposals are selected; Principle Investigators are then asked to submit a full proposal. All proposals are reviewed and approved by the METRANS Executive Committee.

Pre-proposals for the 2004-2005 *Monitoring the Ports* program will be submitted by faculty at the end of January, 2005. Executive Committee selection of pre-proposals will take place in February; full proposals will be due mid-March. The funding start date will be June 2005. CSULB faculty members will have access to online course materials from the Global Logistics Specialist (GLS) program to facilitate the proposal writing process.

Results from individual research projects funded as part of the 2003-04 Applied Research program and for which draft final reports were submitted during the latter half of 2004 are included below:

AR04-01 A Study of Drayage at the Ports of Los Angeles and Long Beach

Point of Contact: Kristen Monaco and Lisa Grobar
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The research examines the drayage segment of the truck industry. A driver survey was conducted at the Los Angeles/Long Beach ports to gather information on working conditions, wages and driver characteristics. The research builds upon Metrans work by Grobar and Barber (2001) on truck delays at the port and involves a general survey of 60 drayage firms on use of technology, a self-administered driver survey on wages and working conditions to be conducted at port; and a detailed review of 2 years of dispatch data for 10 firms.

B. Research Project Status

Completed

- Project Number:** 99-3
Research Project: A Task Decomposition Model for Dispatchers in Dynamic Scheduling of Demand Responsive Transit Systems
Principal Investigators: Mansour Rahimi
Department of Industrial and Systems Engineering
University of Southern California
Maged Dessouky
Department of Industrial and Systems Engineering
University of Southern California
- Project Number:** 99-5
Research Project: Improving fuel economy and emissions performance of commercial goods transportation and mass transit vehicles using throttleless engines
Principal Investigators: Paul D. Ronney
Aerospace and Mechanical Engineering
University of Southern California
- Project Number:** 99-7
Research Project: Modeling and Route Guidance of Trucks in Metropolitan Areas
Principal Investigators: Petros Ioannou
Electrical Engineering Systems
University of Southern California
Anastasios Chassiakos
College of Engineering
California State University, Long Beach
- Project Number:** 99-10
Research Project: Implementing a Statewide Goods Movement Strategy and Performance Measurement of Goods Movement in California
Principal Investigators: Daniel Barber
Graduate Center for Public Policy Administration
California State University, Long Beach
Lisa Grobar
Department of Economics
California State University, Long Beach

Project Number: 99-11
Research Project: The Role of Public Transit in the Mobility of Low Income Households
Principal Investigator: Genevieve Giuliano
 School of Policy, Planning, and Development
 University of Southern California

Project Number: 99-14
Research Project: 3D Virtual and Physical Simulation of Automated Container Terminal and Analysis of Impact on In Land Transportation
Principal Investigator: Behrokh Khoshnevis
 Industrial and Systems Engineering
 University of Southern California

Project Number: 99-18
Research Project: Identification and Analysis of Local Agency Transit Project Performance Criteria (Research Initiation Grant)
Principal Investigator: John A. Kuprenas
 Department of Civil Engineering
 University of Southern California

Project Number: 99-19
Research Project: Solid State Sorption Air Conditioner System for Containerships and Vehicles—Phase I
Principal Investigators: Reza Toossi
 College of Engineering
 California State University, Long Beach

Project Number: 99-20
Research Project: Use of Robotics and Expert Systems in Improving the Handling of Containers at the Port Terminals
Principal Investigators: Timothy Jordanides
 Electrical Engineering Department
 California State University, Long Beach

Project Number: 99-22
Research Project: Highway Oriented Transit System: A Comprehensive Land Use/Transportation Strategy to Improve Transit Service Delivery
Principal Investigator: Tridib Banerjee
 School of Policy, Planning, and Development
 University of Southern California

Project Number: 99-23
Research Project: Non-invasive Means of Investigating Container Contents for Customs Agents at Port
Principal Investigator: K. A. James
 Electrical Engineering Department
 California State University, Long Beach

Project Number: 99-25
Research Project: Assembling and Processing Freight Shipment Data: Developing a GIS-Based Origin-Destination Matrix for Southern California Freight Flows
Principal Investigator: Peter Gordon
 School of Policy, Planning, and Development
 Department of Economics
 University of Southern California

Project Number: 99-27
Research Project: Dynamic Coordination Framework for Resource Allocation in Trucking Operations
Principal Investigator: Satish Bukkapatnam
 Industrial and Systems Engineering
 University of Southern California

Project Number: 00-3
Research Project: Alternative Access and Locations for Air Cargo
Principal Investigator: Randolph W. Hall
 Industrial and Systems Engineering
 University of Southern California

Project Number: 00-5
Research Project: Risk Modeling for Commercial Goods Transport
Principal Investigator: Emelinda M. Parentela
 Department of Civil Engineering
 California State University, Long Beach

Project Number: 00-6
Research Project: Assessment of Hybrid Configuration and Control Strategies in Planning Future Metropolitan/Urban Transit Systems
Principal Investigator: Reza Toossi
 Mechanical Engineering Department
 California State University, Long Beach

Project Number: 00-7
Research Project: Solid State Sorption Air Conditioner System for Containerships and Vehicles—Phase II
Principal Investigators: Reza Toossi
 College of Engineering
 California State University, Long Beach

Project Number: 00-8
Research Project: Travel Patterns of the Elderly
Principal Investigators: Genevieve Giuliano
School and Policy, Planning and Development
University of Southern California

Project Number: 00-11
Research Project: Investigating the Role of Driver Decisions and Styles
In Highway-Rail Crossing Accidents
Principal Investigators: Naj Meshkati, Mansour Rahimi & Michael Driver
School of Engineering and School of Business
University of Southern California

Project Number: 00-13
Research Project: Distributed Architecture for Real-time Coordination in
Transit Networks
Principal Investigators: Satish Bukkapatnam and Maged Dessouky
Industrial and Systems Engineering
University of Southern California

Project Number: 00-15
Research Project: Dynamic Optimization of Cargo Movement by Trucks in
Metropolitan Areas with Adjacent Ports
Principal Investigators: Petros Ioannou and Anastasios Chassiakos
Departments of Electrical Engineering
University of Southern California and
California State University, Long Beach

Project Number: 00-16
Research Project: Design and Optimization of a Conceptual Automated Yard
Using Overhead Grill Rail System
Principal Investigators: Elias Kosmatopoulos
Department of Electrical Engineering
University of Southern California

Project Number: 00-17
Research Project: An Integrated Approach to Managing Local Container
Traffic Growth in the Long Beach/Los Angeles Port
Complex Phase II
Principal Investigators: Lisa Grobar and Daniel Barber
Departments of Economics and Public Administration
California State University, Long Beach

Project Number: 01-2
Research Project: Reducing Pollutants from Mobil Sources
Principal Investigators: Hamid R. Rahai
Mechanical Engineering Department
California State University, Long Beach

Project Number: 01-5
Research Project: The Logistics of Empty Cargo Containers in the Southern California Region: Are Current International Logistics Practices a Barrier to Rationalizing the Regional Movement of Empty Containers

Principal Investigators: Le Dam Hanh
Department of Civil and Environmental Engineering
University of Southern California

Project Number 01-6
Research Project Green Transit Scheduler: A Methodology for Jointly Optimizing Cost, Service, and Life-Cycle Environmental Performance in Demand-Responsive Transit Scheduling

Principal Investigators: Mansour Rahimi, Maged Dessouky, Merill Weidner
Department of Industrial and Systems Engineering
University of Southern California

Project Number 01-10
Research Project Parametric Frequency Domain Identification Using Variable Stiffness and Damping Devices

Principal Investigators: Erik Johnson and Mohamed Elmasry
Department of Civil and Environmental Engineering
University of Southern California

Project Number 03-01
Research Project A Novel Approach to Routing and Dispatching Trucks Based on Partial Information in a Dynamic Environment

Principal Investigators: Maged Dessouky, Petros Ioannou
Department of Industrial and Systems Engineering and
Department of Electrical Engineering – Systems
University of Southern California

Project Number: 03-20
Research Project: Neighborhood Attributes and Commuting Behavior: Transit Choice

Principal Investigators: Peter Gordon, James E. Moore II, Harry Richardson, Christopher Williamson, Bumsoo Lee
School of Policy, Planning, and Development Department of Economics, Department of Industrial and Systems, Department of Civil Engineering, Department of Geography
University of Southern California

Ongoing

Draft Report Received (Under Review)

Project Number: 00-12
Research Project: Freeway Bus Station Development: Critical Evaluation and Design Guidelines
Principal Investigators: Tridib Banerjee
Policy, Planning and Development
University of Southern California

Project Number: 01-14
Research Project: Developing and Testing Methodologies for the Evaluation of Highway Widening Plans to Facilitate Freight Flows Throughout a Major Metropolitan Area
Principal Investigators: Peter Gordon
School of Policy, Planning, and Development
University of Southern California

Project Number: 01-16
Research Project: Automated Trucks on Dedicated Lanes for Cargo Movement
Principal Investigators: Petros Ioannou
Department of Electrical Engineering – Systems
University of Southern California
Anastasios Chassiakos
Department of Electrical Engineering
California State University, Long Beach

Project Number: 03-07
Research Project: Freight Routing and Containerization
Principal Investigator: Randolph Hall
Epstein Department of Industrial and Systems Engineering
University of Southern California

Project Number: 03-24
Research Project: Increasing Bus Transit Ridership: Dynamics of Density, Land Use, and Population Growth
Principal Investigators: Tridib Banerjee
School of Policy, Planning, and Development
University of Southern California
Dowell Myers
School of Policy, Planning, and Development
University of Southern California
Clara Irazabal
School of Policy, Planning, and Development
University of Southern California

Projects In Progress

- Project Number:** 01-3
Research Project: Analysis of Vibrations and Infrastructure Deterioration Caused by High-Speed Rail Transit
Principal Investigators: Hung Leung Wong
Department of Civil Engineering
University of Southern California
- Project Number:** 03-06
Research Project: Robust Investment Decisions for Highway Capacity Expansion
Principal Investigator: Fernando Ordonez
Epstein Department of Industrial and Systems Engineering
University of Southern California
- Project Number:** 03-13
Research Project: Hydrogen Storage System for Transportation Applications
Principal Investigator: Reza Toossi
Mechanical and Aerospace Engineering Department
California State University, Long Beach
- Project Number:** 03-17
Research Project: Innovative Bridge Structural Health Monitoring using Variable Stiffness and Damping Devices
Principal Investigator: Erik Johnson
Department of Civil and Environmental Engineering
University of Southern California
- Project Number:** 03-18
Research Project: Cooperative Optimum Time Window Generation for Cargo Delivery/Pick up with Application to Container Terminals
Principal Investigators: Petros Ioannou
Department of Electrical Engineering – Systems
University of Southern California
Anastasios Chassiakos
Department of Electrical Engineering
California State University, Long Beach
- Project Number:** 03-19
Research Project: Measuring California’s Role in Supporting Interstate Goods Movement: Comprehensive Assessment of Interstate Freight Flows
Principal Investigators: Harry Richardson
School of Policy, Planning, and Development
University of Southern California
Peter Gordon
School of Policy, Planning, and Development
University of Southern California

James E. Moore
Epstein Department of Industrial and Systems Engineering
University of Southern California

Project Number: 03-23
Research Project: Improved Modeling of Network Transportation Flows,
Including Land Use-Transportation Interactions: A
Research Collaboration Between USC (METRANS) and
Caltrans District 7 (Office of Advance Planning)
Principal Investigator: James E. Moore
Epstein Department of Industrial and Systems Engineering
University of Southern California

Project Number: 03-25
Research Project: Development of an Artificial Intelligence Based Traffic
Simulation Model using the Discrete Element Method
Principal Investigators: Emelinda Parentela
Department of Civil Engineering
California State University, Long Beach
Andrew Ronnau
Department of Civil Engineering
California State University, Long Beach

Project Number: 03-27
Research Project: Methodology for Probabilistic Assessment of Permanent
Ground Displacement Across Earthquake Faults for the
Transportation System
Principal Investigators: Mihailo Trifunac
Department of Civil and Environmental Engineering
University of Southern California
Maria Todorovska
Department of Civil and Environmental Engineering
University of Southern California

Project Number: 04-03
Research Project: Evolution of Collective Sensory Systems for Intelligent
Vehicles
Principal Investigator: Karl-H. Grote
Department of Mechanical and Aerospace Engineering
California State University, Long Beach

Project Number: 04-04
Research Project: Landside Surface Transportation Impact of Short Sea
Shipping in Southern California
Principal Investigator: Le Dam Hanh
Department of Civil and Environmental Engineering
University of Southern California

Project Number: 04-05
Research Project: Development of Methods for Handling Empty Containers with Applications in the Los Angeles/Long Beach Port Area
Principal Investigators: Petros Ioannou, Anastasios Chassiakos
Department of Electrical Engineering – Systems, College of Engineering
University of Southern California, California State University, Long Beach

Project Number: 04-06
Research Project: Evaluation of the Terminal Gate Appointment System at the Los Angeles/Long Beach
Principal Investigators: Genevieve Giuliano, Joseph Magaddino
School of Policy, Planning, and Development
Department of Economics
University of Southern California, California State University, Long Beach

Project Number: 04-08
Research Project: SURE-SE: Sensors for Unexpected Roadway Events: Simulation and Evaluation
Principal Investigators: Genevieve Giuliano, John Heidemann
School of Policy, Planning, and Development
Information Sciences Institute
University of Southern California

Project Number: 04-09
Research Project: Reduction of Construction Project Risks to Pedestrians, Drivers, and Transit Passengers through Analysis of Historical Accident Records
Principal Investigator: John Kuprenas
Department of Civil Engineering
University of Southern California

Project Number: 04-13
Research Project: What Can We Learn from CTPP 2000? Neighborhood Attributes, Commuting Behavior and Jobs-Housing Balance: A Comparative 1990-2000 Study Across California’s Major Metropolitan Areas
Principal Investigator: Harry Richardson
School of Policy, Planning, and Development
University of Southern California

Project Number: 04-15
Research Project: Confidence Intervals for Estimated Traffic Demand
Principal Investigators: Fernando Ordonez, Kurt Palmer
Department of Industrial and Systems Engineering
University of Southern California

Project Number: 04-18
Research Project Transit Investment and the Capitalization of Access into
Land Values
Principal Investigator: Christian Redfearn
School of Policy, Planning, and Development
University of Southern California

Ongoing (Applied Research)

Projects In Progress

Project Number: AR04-02
Research Project: Labor at the Ports: Comparing Work Rules and Working
Conditions of the ILA and ILWU
Principal Investigator: Kristen Monaco
Department of Economics
California State University, Long Beach

C. Financial Status:

Fiscal reporting for years 2003-4 and 2004-5 are provided in Tables 1 and 2. All funding prior to 2003-4 has been fully committed. Funds for 2003-4 are 48% committed; most of these funds are budget for ongoing research projects. In addition METRANS is retaining a reserve fund equivalent to about one year of administration expenses. This will enable us to continue operating in the event of reauthorization funding delays or loss of UTC designation. Funds for 2004-5 are 3.7% committed, due to the 1) late receipt of additional federal funds, 2) pending receipt of Caltrans funds, 3) start of 04-05 research projects after 2/1/05.

Funds for 2004-5 have been committed for core administration, *Building Bridges* newsletter, *METRANS NEWS*, and website maintenance. Specific technology transfer activities (e.g. conferences, workshops) are approved on a case by case basis. Technology transfer activities approved for this year include the METRANS Annual Conference, the Seventh Town Hall Meeting, and redesign of the METRANS website. A major national conference is under consideration for fall 2005.

For the 2003-4 year, expenditures are allocated as follows: research 59%, education 1%, technology transfer 18%, and administration 22%. Included in research are student salaries. As noted in previous reports, administrative costs include a portion of technology transfer. These activities will also remain stable as no significant changes are being made in our profile of activities.

For the past six years, Caltrans has provided dollar-for-dollar matching for all DOT funds. USC continues to provide matching funds for the Director's salary and associated expenses. In 2004-5 the USC match is \$120,017, which includes the salary of the Director and associated costs as well as USC overhead contribution. Total match funding for 2003-4 was \$1,090,200. This includes other research projects directly related to METRANS research, additional funding for outreach efforts, and donations for the Town Hall and Annual Conference.

TABLE 1

Actual vs. Budgeted Expenditures: 2003/4 Fiscal Year METRANS Center July 1, 2003 Thru June 30, 2004

<u>Categories</u>	<u>Funds Encumbered</u>	<u>Balance</u>	<u>Revised Budget</u>
Center Director Salary	70,317	0	70,317
Faculty Salaries	204,254	52,302	256,556
Administrative Staff	70,861	58,662	129,523
Other Staff Salaries	0	0	0
Student Support (Subject to Fringe)	0	0	0
Fringe Benefits	66,392	84,219	150,611
Student Support (Not Subject to Fringe)	158,987	176,946	335,933
<u>Total Salary & Benefits</u>	<u>570,811</u>	<u>372,129</u>	<u>942,940</u>
Scholarships	2,000	69,000	71,000
Permanent Equipment	0	0	0
Expendable Property and Supplies	69,047	88,809	157,856
Domestic Travel	5,489	23,421	28,910
Foreign Travel	0	0	0
Other Direct Costs	28,221	61,996	90,217
<u>Total Direct Costs</u>	<u>675,568</u>	<u>615,355</u>	<u>1,290,923</u>
Indirect Costs	256,720	388,557	645,277
<u>Total</u>	<u>932,288</u>	<u>1,003,912</u>	<u>1,936,200</u>

Federal Share 906,000

Matching Share 1,030,200

Match Sources

USC Match: 72,400

USC Director Academic Salary: \$51,800 (includes associated fringe and OH)

Caltrans: 906,000

Other Match Sources Not Included Above

Caltrans VWS: \$40,000

Caltrans Port Impact Study: \$20,000

TABLE 2

Actual vs. Budgeted Expenditures: 2004/05 Fiscal Year METRANS Center July 1, 2004 Thru June 30, 2005

	Approved Budget	Committed To Date	Funding Balance
Center Director Salary	66,213	0	66,213
Faculty Salaries	206,000	0	206,000
Administrative Staff	164,609	24,570	140,039
Students Salaries (Subject to Fringe)	244,571	0	244,571
Students Salaries (Not Subject to Fringe)	79,880	820	79,060
Fringe Benefits	191,432	8,108	183,324
TOTAL SALARIES & BENEFITS	952,706	33,498	919,208
Scholarships	50,000	0	50,000
Permanent Equipment	0	0	0
Expendable Property and Supplies	87,914	5,883	82,031
Domestic Travel	71,868	692	71,176
Tuition and Student Health Fees	20,200	0	0
Technology Transfer Projects	22,618	0	22,618
TOTAL DIRECT COSTS	1,205,305	6,575	1,198,730
Indirect Costs	601,713	27,596	574,117
TOTAL COSTS	1,807,017	67,669	1,739,348

FEDERAL SHARE 680,000

MATCHING SHARE 1,127,017

Match Sources:

USC Match: \$68,317

USC Director Academic Salary: \$58,700 (includes associated fringe and OH)

Caltrans: \$1,000,000

Does not include additional \$282K allocated by DOT in January 2005.