



**Year 18 (2005-2006)**  
**Semi-Annual Progress Report**  
**For the**  
**University of California Transportation Center**

**April 2006**

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## **A. SUCCESS STORIES**

The University of California Transportation Center is pleased to serve as the designated Federal Region 9 University Transportation Center. We are especially proud of our long partnership with the California Department of Transportation, the provider of UCTC's matching funds.

UCTC's funding is used to sponsor faculty research and contribute to conferences, symposia, and other technology transfer activities. We also underwrite education for both undergraduates and graduate students, through support for new courses and through graduate fellowships, grants, and research appointments

UCTC's research pays off in many ways. It is put into practice by leaders in the field and by our graduates, many of whom are themselves becoming top leaders in the transportation industry. Our faculty and students win awards for the quality of their work, and many of our faculty members are invited to advise elected officials and federal, state, and local agencies. Our conferences and symposia are well attended, and practitioners turn to UCTC for new ideas to address transportation problems, for analysis and evaluation, and for advice and assistance with policy development and implementation.

The following examples document some of our results to date in the first half of the UCTC's 2005-2006 grant year – the UC Transportation Center's 18<sup>th</sup> year.

### **RESEARCH INTO PRACTICE**

#### **Working with FTA on Transit-Oriented Development Guidelines**

In cooperation with the Federal Transit Administration, UCTC is carrying out a series of case studies of FTA New Starts and the planning for transit-oriented development in the station areas. Eight cases will be completed in summer 2006 and recommendations on how to "benchmark" TOD (measure and track it) will be forwarded to FTA staff.

#### **Advising the California Department of Business, Housing and Transportation**

Professor David Dowall and graduate student Jan Whittington have been working with California BHT Secretary Sunne McPeak on innovative finance issues.

Professors Elizabeth Deakin and Dan Sperling are members of the Caltrans Go California advisory group.

#### **Advising Transit Operators**

Professors Elizabeth Deakin and Robert Cervero are on the Advisory Committee for the Bay Area Regional Rail Plan, a major study being conducted for the Bay Area Transit District (BART), the San Mateo County Transit District (Samtrans), the Santa Clara Valley Transit Authority (VTA), the Metropolitan Transportation Commission (MTC), and the Association of Bay Area Governments (ABAG.)

Professor Mike McNally is an advisor to the Orange County Transit District.

### **Advising Government Agencies**

Professor Donald Shoup has been working with local governments on the reform of their parking policies and has been speaking to many agencies about his new book about parking.

Prof. Mike Cassidy has developed algorithms that are being tested on freeways in Los Angeles as potential congestion management strategies.

### **Advising Transportation Industries**

Professor Amelia Regan has worked with on algorithms for efficient routing that have been adopted by a major trucking company.

## **CONFERENCES AND SYMPOSIA**

### **Asilomar Conference, August 2005**

More than 200 people from around the world came together at the 10<sup>th</sup> Biennial Conference on Transportation Energy and Environmental Policy, held at Asilomar in 2005. The conference is organized by UC Davis with UCTC co-sponsorship. This year's topic was climate change, and over 200 participants from all over the US and from Japan, Germany, Canada, and the U.K. participated. They represented state and federal governments, national labs, universities, auto and energy industries, international agencies such as the World Bank, and nongovernmental organizations. Attendees concluded that a portfolio of policies together with a broader selection of technology options will help the nation and the world move forward in addressing climate change. But a critical and missing component is a set of narratives that can communicate what's at stake and mobilize the world's people to make smart energy choices that can make a difference. The greatest need, attendees agreed, is for strong global leadership on climate change.

### **Lake Arrowhead Conference, October 2005**

The 2005 Lake Arrowhead Symposium on the Transportation-Land Use-Environment Connection tackled the issue of transportation and public health. The 100 participants included national and state public and private transportation organizations elected officials, and academics. Sessions examined public health trends related to transportation, land use, and air quality, as well as ways to measure the public health benefits of alternative policies and interventions. Presentations addressed issues of risk and safety, emissions and exposure, and physical activity and urban form. Concerns about diesel emissions related to truck traffic and port activities were identified as a key area for both research and policy action. The Lake Arrowhead Symposium is organized each year by the UCLA Extension Public Policy Program in cooperation with the UCLA Institute of Transportation Studies and is co-sponsored by UCTC and a number of public agencies.

### **Transportation Research Board Annual Meeting, January 2006**

Faculty members and graduate students affiliated with UCTC presented nearly 200 papers at sessions of the annual meeting of the Transportation Research Board this January in Washington, DC. In addition, the UC Transportation Center jointly hosted a reception at TRB with its ITS partners from the Berkeley, Irvine, Davis, and LA campuses, the UC PATH program, the UC Center for Traffic Safety, and the National Center of Excellence for Aviation Operations Research. Over 300 faculty and students from all UC campuses, alumni of the UC transportation programs and UCTC, and friends from many other transportation centers and research groups joined us at this event.

### **UCTC Student Conference, February 9-11, 2006**

Graduate students from UC Berkeley hosted the 2006 UCTC Student Conference, which was attended by 125 students, faculty, and guests from public and private organizations. Sir Peter Hall, Professor Emeritus of UC Berkeley's Dept. of City and Regional Planning, gave the keynote Mel Webber Lecture. Prof. Hall was knighted in 1998 for his contributions to urban and regional planning and won the Balzan Prize in 2005 for his contributions to urban geography. William Lieberman, the Deputy Director for Planning at San Francisco Muni, gave the luncheon talk. Students presented their research in paper and poster sessions and toured the Port of Oakland as a special field trip.

### **European Council of Ministers of Transport/Organisation for Economic Cooperation and Development Roundtable 37: Transportation, Urban Form, and the Environment, March 26-28, 2007**

UCTC hosted a roundtable examining the evidence on transportation's effects on urban form and environmental quality at a roundtable involving 50 invited participants from the US, Europe, and Japan. The event, held at the Faculty Club, UC Berkeley campus, was organized by OECD staffer Andreas Kopp and Professor Elizabeth Deakin. Deakin also wrote a background paper for the event. Professor Emeritus Martin Wachs led the discussion as moderator.

### **Planning for the World Conference on Transportation Research Society (WCRTS) 2007 Conference -to be held in Berkeley, CA June 24-28, 2007**

UCTS and its ITS began planning for the 11th World Conference on Transportation Research (WCTR), a gathering that attracts as many as 1,000 leading transportation professionals from around the globe. An organizational meeting of UCTC's Executive Committee and WCTR leaders from Japan and Europe was held in October 2005... The 2007 conference will be the first time the WCTR Society has chosen to convene the event in the United States since the organization's inception in 1973.

The 11th World Conference will cover a range of transportation topics, including transportation planning, systems analysis, economics, operations and management. The WCTR Society, which has more than 800 members, is composed of transportation researchers, managers, policy makers and educators from around the world. The society's world conferences allow these professionals to gather every three years to exchange ideas and learn from one another. The conference website is at [www.uctc.net/wctrs](http://www.uctc.net/wctrs). UCTC Director Elizabeth Deakin and ITS Berkeley Director Samer Madanat are co-chairs of the

initiative, with faculty members Robert Cervero, Carlos Daganzo, Reg Golledge, Kostas Goulias, Susan Handy, Pat Mokhtarian, Dan Sperling, Brian Taylor, Will Recker, Amelia Regan, and Jean Daniel Saphores serving on the local organizing committee along with Prof. Emeritus Martin Wachs and USC Professor and Metrans Director Gen Giuliano.

## **AWARDS AND HONORS**

### **UCTC-Funded Book, "The High Cost of Free Parking," On Top 10 Book List**

UCLA Urban Planning Professor Donald Shoup's recently published book, "The High Cost of Free Parking" (American Planning Association Press, 2005), has been named a winner in Planetizen's Fifth Annual Top 10 Books List, 2006 Edition. The book has been called "an instant planning classic" by one reviewer and was described as a "tour-de-force on free parking" as well as "the hands-down favorite for Top Books status" by Planetizen, a public-interest information exchange for the urban planning, design and development community.

### **UCTC-Funded Paper Is Journal of the American Planning Association Best Article**

Prof. Judith Innes and the late Prof. Judith Gruber of UC Berkeley won the APA's 2005-6 best article award for their UCTC-funded paper, "Planning Styles in Conflict: The Metropolitan Transportation Commission," published in JAPA in Spring 2005. Based on a five-year study of the San Francisco Bay Area Metropolitan Transportation Commission, the authors analyzed the conditions, differing planning styles, and obstacles hindering more collaboration among transportation planning agencies. The reviewers, in selecting the article for the award, noted that it is illuminating not only for planning academics, but also for practicing planners who want to better understand why their plans are not always accepted by colleagues, politicians, and the public.

### **Varaiya Elected to American Academy of Arts and Sciences**

Pravin Varaiya, Professor of Electrical Engineering and Computer Science, was elected to the American Academy of Arts and Sciences (AAAS) on April 24, 2006.

### **Monismith Inducted into NAPA Hall of Fame**

Berkeley Professor Emeritus Carl Monismith was inducted into the National Asphalt Pavement Association (NAPA) Hot Mix Asphalt Hall of Fame as part of the association's 50th anniversary celebration at the Smithsonian Institution's National Museum of American History in Washington, D.C., on July 19, 2005. Monismith was honored for developing techniques for flexible pavement design and analysis that nationally recognized and in use today as well as for his outstanding teaching and mentoring

### **Morris Wins 2006 APA Transportation Division Award for Outstanding Student Paper**

UCLA Urban Planning Student Eric Morris is the winner of the American Planning Association Transportation Division's 2006 outstanding student paper competition for his

paper titled, "The Privatization of British Rail: How Did It Turn Into a Train Wreck?" Morris, currently a master's student, will enter the UCLA doctoral program this fall.

### **Buckland Is American Society for Public Administration Student Paper Finalist**

UCLA Transportation alumna Lauren Buckland was one of four finalists in the annual student paper competition of the Section on Transportation Policy and Administration of the American Society for Public Administration for her paper, "Balancing Equity and Efficiency in Transit in Los Angeles." Lauren is currently a Bicycle and Pedestrian Planner at Alta Planning + Design in Berkeley

### **Chatman Is UCTC Student of the Year**

Dan Chatman was elected the University of California's Student of the Year for 2005-2006. Chatman, who received his PhD in June 2005 from UCLA, is now assistant professor of urban planning and public policy at Rutgers University and director of research for the Alan M. Voorhees Transportation Center. Chatman carries out research on transportation and land use policies.

### **UCTC Student Affiliates Win Eisenhower Fellowships**

2005-6 Eisenhower Fellowships were awarded to Berkeley students Patricia Lynn Scholl, Christopher Cherry, James Rubin, Sarah Syed, Meghan Mitman, Elliot Martin, Joshua Seelig, Sarah Syed, and David Uneman, UCLA students David King and Andrew Mondschein, and UC Irvine student Kenneth Joh. This year's winners join continuing Eisenhower fellowship holders [Greg Newmark](#), [Gian-Claudia Sciara](#), [Anne Goodchild](#), [Karen Frick](#), and [Brad Flamm](#) (Berkeley) and [Camille Fink](#) (UCLA.)

## **NEW ACADEMIC COURSES AND PROGRAMS**

### **Urban Studies Undergraduate Major in 3<sup>rd</sup> Year**

The undergraduate major in Urban Studies is in its third year at UC Berkeley. This major is sponsored by the Dept. of City and Regional Planning in cooperation with several social sciences departments, including Political Science, Sociology, and Economics. Course offerings for this new major include the undergraduate courses in transportation planning previously supported by UCTC. In addition, most of the core courses in the major have transportation content. This year the transportation undergraduate course is being offered each semester with over 50 students enrolled each time.

### **Global Metropolitan Studies Initiative**

Berkeley's new Global Metropolitan Studies Initiative is in the process of hiring the first of five new faculty members with interdisciplinary interests. UCTC Director Elizabeth Deakin is Co-Director of the new initiative, and UC Berkeley ITS Director Samer Madanat is a member of the Executive Committee as is Faculty Affiliate Peter Bosselmann. Over 70 faculty members from 10 departments have chosen to affiliate with the new initiative.

Emerging research topics include California at 50, Sustainable Development, China Studies, Shrinking Cities, and Agriculture at the Metropolitan Edge. In addition, students have organized a working group on the metropolitan problems of the Global South. See [www.metrostudies.berkeley.edu](http://www.metrostudies.berkeley.edu) for more information.

## UC Santa Barbara Designated Emphasis

Faculty members in the Department of Geography at UC Santa Barbara have applied to the university for formal recognition of their transportation program as a graduate “designated emphasis.”

## PUBLICATIONS

UCTC helps put research into practice by making our publications available free of charge. All final reports and most other UCTC publications can be directly downloaded from the web; others are mailed to anyone who requests a copy. Our publications are listed on our web page, where we are now receiving thousands of downloads a month.

We also publish ACCESS, a twice-yearly magazine designed to bring UCTC research findings to the general public. ACCESS is distributed free of charge to about 20,000 subscribers in hard copy, and another 21,000 downloads of ACCESS from the web add to its readership.

Publications stemming directly from research projects include final summary reports – brief statements of the work performed on each completed UCTC project, designed to allow the busy professional to learn about the major findings of the research without delving into the details. In addition, all UCTC projects produce at least one other, full-length product – a technical report, a working paper, a journal article, a monograph, or even a book or film. Many researchers produce two or three papers in the course of their work on a project, hence our publication list is several times longer than our number of research projects.

New papers added summer and fall 2005 are shown in Table 1.

**Table 1 New UCTC Publications, Summer and Fall 2005**

Innes, Judith E., and Judith Gruber	Planning Styles in Conflict: The Metropolitan Transportation Commission	2005, Summer	736
Crabbe, Amber E., Rachel Hiatt, Susan D. Poliwka, and Martin Wachs	<a href="#">Local Transportation Sales Taxes: California's Experiment in Transportation Finance</a>	2005, Summer	737
Loukaitou-Sideris, Anastasia, Robin Liggett, Hyun-Gun Sung, Marcelle Boudreaux, and Rebecca Ratzkin	Death on the Crosswalk: A Study of Pedestrian-Automobile Collisions in Los Angeles	2005, Summer	738
Decker, Annie	<a href="#">The Effects of Land Use on the Mobility of Elderly and Disabled and Their Homecare Workers, and the Effects of Care on Client Mobility: Findings from Contra Costa, California</a>	2005, Summer	739



<b>Table 1 cont.</b>			
Brown, Colby, Prashant Balepur, and Patricia L. Mokhtarian	<a href="#">Communication Chains: A Methodology for Assessing the Effects of the Internet on Communication and Travel</a>	2005, Summer	740
Cao, Xinyu, and Patricia L. Mokhtarian	<a href="#">How do individuals adapt their personal travel? A conceptual exploration of the consideration of travel-related strategies</a>	2005, Summer	741
Cao, Xinyu, and Patricia L. Mokhtarian	<a href="#">How do individuals adapt their personal travel? Objective and subjective influences on the consideration of travel-related strategies for San Francisco Bay Area commuters</a>	2005, Summer	742
Cao, Xinyu, and Patricia L. Mokhtarian	<a href="#">The Intended and Actual Adoption of Online Purchasing: A Brief Review of Recent Literature</a>	2005, Summer	743
Handy, Susan, Xinyu Cao, and Patricia L. Mokhtarian	<a href="#">Correlation or causality between the built environment and travel behavior? Evidence from Northern California</a>	2005, Summer	744
Ory, David T., and Patricia L. Mokhtarian	<a href="#">Modeling the Joint Labor-Commute Engagement Decisions of San Francisco Bay Area Residents</a>	2005, Summer	745
Ory, David T., and Patricia L. Mokhtarian	<a href="#">Don't Work, Work at Home, or Commute? Discrete Choice Models of the Decision for San Francisco Bay Area Residents</a>	2005, Summer	746
Pagès, Laia, R. Jayakrishnan, and Cristián E. Cortés	<a href="#">Real-Time Mass Passenger Transport Network Optimization Problems</a>	2005, Summer	747
Jayakrishnan, R., and Laia Pagès	<a href="#">Mass Transport Vehicle Routing Problem (MTVRP) and the Associated Network Design Problem (MTNDP)</a>	2005, Summer	748
Van Dender, Kurt	<a href="#">Duopoly Prices Under Congested Access</a>	2005, Fall	749
De Borger, Bruno, and Kurt Van Dender	<a href="#">Prices, capacities and service quality in a congestible Bertrand duopoly</a>	2005, Fall	750
Ishii, Jun, Kurt Van Dender, and Sunyoung Jun	<a href="#">Airport choice and airline choice in the market for air travel between the San Francisco Bay area and greater Los Angeles in 1995</a>	2005, Fall	751
Blumenberg, Evelyn	<a href="#">Transportation Barriers to Employment: Southeast Asian Welfare Recipients in Los Angeles and Fresno Counties</a>	2005, Fall	752
Mondschein, Andrew, Evelyn Blumenberg, and Brian D. Taylor	<a href="#">Cognitive Mapping, Travel Behavior, and Access to Opportunity</a>	2005, Fall	753
Kuhn, Kenneth D., and Samer M. Madanat	<a href="#">Robust Maintenance Policies for Markovian Systems under Model Uncertainty</a>	2005, Fall	754
Kuhn, Kenneth D., and Samer M. Madanat	<a href="#">Model Uncertainty and the Management of a System of Infrastructure Facilities</a>	2005, Fall	755
Shoup, Donald C.	<a href="#">Reduce Demand Rather than Increase Supply</a>	2005, Fall	756

## B. RESEARCH PROJECT STATUS

The UCTC currently has 32 active research projects – 10 new awards made in Fall 2005, plus 17 carried over from 2004-5 and five carried over from 2005-6 (one of which was recently completed.). Ordinarily, UCTC projects are for one year with up to one year’s extension. However, because of the considerable uncertainty about the budget for the past several years, projects were for the most part funded in increments or started part way through the year. As a result, many extensions have been necessary in order for the projects to be completed.

Ongoing projects from 2003-4 are listed in Table 2, and ongoing 2004-5 projects are listed in Table 3. The projects awarded in 2005-2006 are listed in Table 4. Because of the unusually low amount of funding received, we have decided to provide additional funding in 2006-7, and all projects have already been extended until July 31, 2007.

Please note that all UCTC projects ordinarily include funding for one or two graduate student research positions and for one or two faculty summer months. However, for the projects reported here, few received faculty funding. Faculty time during the academic year is donated, so this will not prevent project advancement. However, delays may be incurred as some faculty may need to make other arrangements for summer salary.

The California Department of Transportation and the US DOT jointly sponsor all projects, although funding may be primarily from one funding source or the other. The External Project Contact is Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440. Caltrans’ dollar-for-dollar match of federal funds for UCTC has been critical to our success.

**Table 2. Year 16 (2003-4) Projects Continuing in Year 18 ( end date 2005-6 - 5 projects)**

<b>Principal Investigator</b>	<b>Campus</b>	<b>Research Project Title</b>
Ted Cohen	Berkeley	Amber Alert Policy: Laboratory Experiments
Robert Johnston	Davis	Improved Developer Models for the Sacramento Region
Amelia Regan	Irvine	Auctions for the Procurement of Transportation Service Contracts
Alexander Skabardonis	Berkeley	Identification and Measurement of Freeway Congestion
Margaret Weir	Berkeley	Transportation Policy Development: Labor as a Missing Stakeholder

**Table 3. Year 17 (2004-5) Projects Continuing in Year 18 (end date 2005-6 - 17 projects)**

<b>Principal Investigator</b>	<b>Campus:</b>	<b>Research Project Title:</b>
Blumenberg, Evelyn	Los Angeles	Auto-mobility, Spatial Isolation, and the Poor Housing-Retail Balance, Travel Demand, and Physical Activity
Cervero, Robert	Berkeley	Transaction-Cost Economic Analysis of Institutional Change toward Design-Build Contracts for Public Transportation
Dowall, David	Berkeley	

**Table 3 cont.**

Golledge, Reginald G.	Santa Barbara	Activity-Oriented Scheduling/Activity Survey and Analysis Via a Unified Real-time Data Collection Framework
Golob, Thomas F.	Irvine	Wet Pavement Accidents on California Highways: Causes, Concentrations, and Potential Means for Reduction
Handy, Susan	Davis	The Davis Bicycle Studies
Johnston, Robert A.	Davis	Testing Spatial Mismatch: A Structural Equations Modeling Approach
Macdonald, Elizabeth	Berkeley	Street Trees and Intersection Safety
Madanat, Samer	Berkeley	Robust Optimal Maintenance and Rehabilitation Policies in Asset Management
Mokhtarian, Patricia L.	Davis	Modeling the Adoption of Teleshopping
Niemeier, Debbie	Davis	Estimating Activity Rates and Emissions from Heavy-Duty Construction Equipment
Ong, Paul M.	Los Angeles	Modeling Car Ownership Rates, and Age and Value of Vehicles
Recker, Wilfred	Irvine	Similarity Analysis for Estimation of an Activity-based Travel Demand Model
Regan, Amelia C.	Irvine	Capacity Modeling for Large Scale Urban Multimodal Freight Transportation Systems
Shoup, Donald	Los Angeles	Cruising for Parking
Stoll, Michael A.	Los Angeles	Why Do Inner City Residents Pay Higher Premiums? The Determinants of Automobile Insurance Premiums
Wachs, Martin	Berkeley	Motor Fuel Price and Expenditure Effects on Vehicle Use in California

**Table 4. Year 18 (2005-6) Research Grants (end date July 2007 - 10 projects)**

Cassidy, Michael	Berkeley	An Empirical and Theoretical Study of Freeway Weave Analysis
Cervero, Robert	Berkeley	Freeway Deconstruction and Urban Renewal: Land Market and Transportation Impacts
Clark, William	Los Angeles	How Much Do Low Income And Foreign-Born Households Use Public Transportation?
Goulias, Kostas	Santa Barbara	A Spatial Analysis of Self-serving and Altruistic Travel Behavior
Harley, Robert	Berkeley	Emission and Air Quality Impacts of New Diesel Engine Control Technologies
Horvath, Arpad	Berkeley	Life-Cycle Environmental Assessment of Passenger Air and Rail Transportation
Kanafani, Adib	Berkeley	The Effect of In-Transit WiFi Internet Access on The Value of Travel Time Implications for Mode-Choice Models
Loukaitou-Sideris, Anastasia	Los Angeles	How Safe Is the Ride? Evaluation of Design and Policy Responses to Women's Fear of Victimization in Transportation Settings
Madanat, Samer	Berkeley	Bottom-up Bridge Management System

## **B. RESEARCH PROJECT STATUS**

### **Status Reports - Year 16 (2003-4)**

#### **Projects Extended to 7/31/2006: 5 Projects**

#### **Amber Alert Policy: Laboratory Experiments to Improve a Policy**

**Principal Investigator:**

Theodore Cohn

UC Berkeley

**Email:** [tecohn@sensitivity.berkeley.edu](mailto:tecohn@sensitivity.berkeley.edu)

**External Project Contact:** All UCTC projects are co-sponsored by Caltrans, Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** In 2002, California adopted the communication protocol known as the Amber Alert (AA) which is now becoming a nationwide effort. The purpose is to alert the driving public to emerging events such as child abduction. The AA structure employs Variable Message Signs (VMS) on California highways. Policy is jointly developed by the CHP, the agency that initiates the alert, and Caltrans, the agency that implements it on VMS signs. CHP would like more information conveyed, to improve the odds of success. Caltrans would like less information conveyed so as to minimize congestion that signs have been observed to cause. We conduct a laboratory study to examine the ability of drivers to acquire the message without the need to slow while passing by. Abbreviations, compacting of text, optimization of presentations that require two screens of information, are a few of the many possible strategies that we study. The outlines of a field operational test of what the lab study reveals will be developed.

**Key Words:** amber alert, variable message signs, congestion management

**Objective:** study ability of drivers to acquire a message without slowing

**Tasks:** Review previous work on the topic, assemble data, analyze data, and prepare reports.

**Milestones, Dates:** Official start date Aug. 1, 2003, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge. .

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** develop sign strategies that better meet objectives of both Caltrans and the California Highway Patrol

**Work Completed to Date:** Project is complete.

**Papers:**

Lance F. Tammero and Theodore E. Cohn, "Amber Alert Policy: Laboratory Experiments to Improve a Policy," UCTC Report, Forthcoming, Spring 2006.

**Conferences Attended:**

None

**Other Accomplishments:**

None

**Percent Complete:** 100%

**Direct Cost:** \$56,275

## **Improved Developer Models for the Sacramento Region**

### **Principal Investigator:**

Robert Johnston

UC Davis

**Email:** [rajohnston@ucdavis.edu](mailto:rajohnston@ucdavis.edu)

**External Project Contact:** All UCTC projects are co-sponsored by Caltrans, Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** Urban models have advanced greatly in the last 20 years. Recent models represent the floor space developer explicitly, increasing the behavioral validity of the land markets in the models. We believe, however, that there is a need to separately represent the developers of large projects on the urban edge, as these projects can strongly affect subsequent development patterns. We estimate and test such a model, and to apply it within an advanced urban model set for the Sacramento region.

**Key Words:** land use models, developer behavior

**Objective:** develop a model of large developer behavior at the urban fringe

**Tasks:** Review previous work on the topic, assemble data, analyze data, and prepare reports.

**Milestones, Dates:** Official start date Aug. 1, 2003, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge. .

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** improved transportation-land use modeling and analysis

**Work Completed to Date:** We have reviewed previous work on the topic and assembled data. Model design and estimation is well underway. .

**Papers to Date:**

None to date

**Conferences Attended:**

Transportation Research Board Annual Meeting, 2004, 2005, 2006

**Other Accomplishments:**

None to date

**Percent Complete:** 95%

**Direct Cost:** \$42,141

## **Auctions for the Procurement of Transportation Service Contracts**

### **Principal Investigator:**

Amelia Regan

UC Irvine

**Email:** [aregan@uci.edu](mailto:aregan@uci.edu)

**External Project Contact:** All UCTC projects are co-sponsored by Caltrans, Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** Large shippers have moved from lane-by-lane negotiation for trucking services to combinatorial auctions, in which several lanes are put out to bid together and trucking companies may bid for more than one package of services. The bid construction and valuation problem is a difficult one involving NP-hard sub problems. This research develops tractable approximation methods for solving these problems and identifies ways that smaller carriers can work together to capture the benefits available to larger carriers.

**Key Words:** trucking, combinatorial auctions, algorithms

**Objective:** develop tractable approximation methods for freight service bid construction and valuation

**Tasks:** Review previous work on the topic, assemble data, analyze data, and prepare reports.

**Milestones, Dates:** Official start date Aug. 1, 2003, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge. .

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** improve health of trucking industry by supporting more effective bidding

**Work Completed to Date:** A literature review has been carried out. Exploratory analyses have been conducted. Model building is advancing.

**Papers to Date:**

None to date

**Conferences Attended:**

Transportation Research Board Annual Meeting, 2004, 2005

**Other Accomplishments:**

None to date

**Percent Complete:** 95%

**Direct Cost:** \$51,603

## Identification and Measurement of Freeway Congestion

### Principal Investigator:

Alexander Skabardonis  
UC Berkeley

**Email:** [skabardonis@ce.berkeley.edu](mailto:skabardonis@ce.berkeley.edu)

**External Project Contact:** All UCTC projects are co-sponsored by Caltrans, Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** The objective of this research is to develop a methodology to identify and measure total, recurrent, and non-recurrent congestion delay on urban freeways. The methodology will be applicable to urban freeways that are instrumented with loop detectors or other surveillance systems. The methodology calculates the average and the probability distribution of congestion delays by cause (recurrent, incident related, weather and other factors). The methodology also quantifies the congestion impacts on travel time and travel time variability. The work is based on recent research by the investigator. The findings to-date indicate that reliable measurement of congestion should provide measures of uncertainty in congestion. In applications on two real-life corridors, incident-related delay is found to be between 13 to 30 percent of the total congestion delay during peak periods.

**Key Words:** recurrent, congestion delay, freeways, surveillance, incident travel time, measurements

**Objective:** develop methods for measuring freeway delay using surveillance devices estimate uncertainty in delay estimates and delay due to incidents and recurrent congestion

**Tasks:** Review previous work on the topic, assemble data, analyze data, and prepare reports.

**Milestones, Dates:** Official start date Aug. 1, 2003, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge. .

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** improved congestion management and delay estimation

**Work Completed to Date:** Data have been assembled and exploratory analyses have been conducted. Case studies are nearing completion.

**Papers to Date:**

None to date

**Conferences Attended:**

Transportation Research Board Annual Meeting, 2004, 2005, 2006

**Other Accomplishments:**

None to date

**Percent Complete:** 95%

**Direct Cost:** \$38,281

## **Transportation Policy Development: Labor as a Missing Stakeholder**

### **Principal Investigator:**

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**External Project Contact:** All UCTC projects are co-sponsored by Caltrans, Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** For over a decade, federal transportation policy has sought to open regional transportation decision-making to new voices and to facilitate the use of transportation funds on an expanded array of transportation modes. Much of the impetus for these changes in federal legislation came from environmentalists and advocates for low-income communities, who believed that existing decision-making processes advantaged developers and highway interests. However, these processes have rarely engaged labor unions. This research project seeks to understand the role of labor in the development of transportation policy. The research takes a two-pronged approach: first, it examines the processes of coalition building in which labor has engaged as it seeks to participate in transportation policymaking. Second, the research analyzes the problems of consensus building around transportation policy within the labor movement, where institutional complexity, the potentially divergent interests of different unions, and a culture organized around the immediate goals of collective bargaining make it difficult for labor to engage effectively. The research is conducted in two states: Illinois, where transit unions have launched a statewide coalition to increase state spending on public transit; and California, (both Los Angeles and the Bay Area), where central labor councils have taken the lead in bringing labor into transportation policymaking.

**Key Words:** transit labor, coalition-building

**Objective:** document and analyze coalition-building strategies used by labor to influence transportation policy

**Tasks:** Review previous work on the topic, assemble data, analyze data, and prepare reports.

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge. .

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** improved understanding of labor issues and concerns; more effective policies

**Work Completed to Date:** The literature review and site visits are completed. Data are being analyzed.

**Papers to Date:** None to date

**Conferences Attended:**

None to date

**Other Accomplishments:**

None to date

**Percent Complete:** 85%

**Direct Cost:** \$41,698



## Status Reports – Year 17

### (2004-2005 Projects Continuing in Year 18 (2005-2006) – 16 projects

#### **Automobility, Spatial Isolation, and the Poor**

##### **Principal Investigator:**

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**External Project Contact:** All UCTC projects are co-sponsored by Caltrans. Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** This research examines the role of transportation access in explaining the spatial isolation of metropolitan residents. Numerous studies suggest that low-income households tend to be concentrated in resource-poor, central-city neighborhoods, isolated from employment opportunities, consumer goods, services. Surprisingly, only a small sub-set of this spatial isolation research examines how automobile availability and transit service quality affect knowledge of and access to opportunities, goods, and services. To examine this issue, we draw on the literature on cognitive models of geographic space to examine how access to automobiles and high-quality transit service affect peoples' (1) knowledge of their city and (2) the physical boundaries of their daily activity spaces. Specifically, this research focuses on three questions: First, are low-income households with automobiles less spatially constrained than transit-dependent low-income households? Second, are low-income households more spatially constrained than higher income households, controlling for access to household vehicles? And, third, does living in a job- and/or transit-rich neighborhood diminish spatial isolation among those dependent on public transit? This research will contribute to our understanding of how mobility influences metropolitan residents' knowledge and perceptions of opportunities, goods, and services.

**Key Words:** low-income, spatial isolation, automobile availability, cognitive models

**Objective:** develop strategies for understanding of how mobility influences metropolitan residents

**Tasks:** Review previous work on the topic, assemble data, analyze data, and prepare reports.

**Milestones, Dates:** Official start date Aug. 1, 2004, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge. .

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** improved transportation and economic policies

**Work Completed to Date:** We have reviewed previous work on the topic and have begun our analyses.

**Papers to Date:**

None to date

**Conferences Attended:**

None to date

**Other Accomplishments:**

None to date

**Percent Complete:** 70%

**Direct Cost:** \$39,339

## Housing-Retail Balance, Travel Demand, and Physical Activity

### Principal Investigator:

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**External Project Contact:** All UCTC projects are co-sponsored by Caltrans. Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** Jobs-housing balance is pursued as a land-use strategy for reducing vehicle miles of travel. Since travel for shopping and personal services accounts for over twice as many motorized trips as journeys-to-work, this research examines “housing-retail” balance as a potentially more effective land-use management strategy. Two hypotheses are tested: 1) that retail-housing balance significantly reduces VMT for shopping and consumer services, with the largest benefits accruing for convenience and non-durable good purchases, and 2) that retail-housing balance increases non-motorized travel, providing physical activity benefits. Using data from BATS 2000, daily activity records are used to determine 24-hour shop trip incidences, vehicle miles, and durations. Isochronic measures of retail accessibility and housing-retail diversity indices are measured using 2000 CTPP Part 2 based on two-digit retail job occupational codes. Nested logit and multiple regression models are used to test hypotheses, generate travel/land-use elasticities, and provide order-of-magnitude comparisons to findings on VMT reductions associated with jobs-housing balance strategies. Case study interviews of neighborhood residents will elicit attitudinal responses regarding the desirability and design aspects of community retail activities and their influences on travel choices and activities.

**Key Words:** Housing-Retail Balance; Accessibility; Mode Choice Logit Analysis; Case Studies.

**Objective:** To measure the degree to which housing-retail balance yields motorized-travel-conserving and physical activity benefits in relation to the strategy of jobs-housing balance.

**Tasks:** Compile travel data from BATS 2000; obtain place of employment data on stratified retail jobs from 2000 CTPP Part 2; using GIS and statistical tools, develop isochronic measures of retail-services accessibility and housing-jobs balance indices; compile control variables; test hypotheses by estimating nested logit and multiple regression models; screen candidate neighborhoods for case-based research; select cases and conduct intercept surveys of residents, shoppers, and merchants; analyze case findings; examine public policy considerations prepare research report

**Milestones, Dates:** Official start date Aug. 1, 2004, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC’s Website and distributed in hard copy, in most instances free of charge. .

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** Measure effects of retail-housing balance to identify new policy options

**Work Completed to Date:** We have reviewed previous work on the topic, have assembled data, and have begun analysis.

**Papers to Date:**

None to date

**Conferences Attended:**

None to date

**Other Accomplishments:**

None to date

**Percent Complete:** 75%

**Direct Cost:** \$49,425

## **Transaction-Cost Economic Analysis of Institutional Change toward Design-Build Contracts for Public Transportation**

### **Principal Investigator:**

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**External Project Contact:** All UCTC projects are co-sponsored by Caltrans. Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** This research is a transaction-cost economic analysis of recently completed transportation projects, informing a comparative evaluation of the institutional change in public contracting from design-bid-build to design-build project delivery. Design-build, in which design and construction services are bundled together, is an alternative form of public contract recently adopted by transportation departments in 24 states. With this method, lower production costs may be obtained by beginning construction before design is complete. Such savings, however, may come at the expense of organized labor and public participation, and could reflect higher transaction costs than traditional methods. At issue is the question of whether or not California's Department of Transportation should also engage in design-build contracting. This research will produce pair-wise case studies and a quantitative database explaining the benefits and cautions of these two modes of delivery. Research techniques will include semi-structured interviews, the review of documents and archival records, and mining online legal and news sources. Analysis will proceed by triangulating evidence to validate or refute propositions from transaction cost economics against rival theoretical interpretations of institutional change.

**Key Words:** transaction-cost economics, public contracting, project delivery, design-build

**Objective:** Comparative evaluation of recently completed surface transportation projects developed according to design-bid-build and design-build methods, assessing actual transaction and production costs as well as relative impacts to organized labor and public participation, with reference to the question of whether or not the State of California should pursue a policy of programmatic design-build contracting.

**Tasks:** 1. Case Selection, 2. Develop Case Study Protocol, 3. Data Collection, 4. Analysis, 5. Final Report

**Milestones, Dates:** Official start date Aug. 1, 2004, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge. .

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** Results should provide decision-makers in California with plausible explanations of the benefits and cautions of design-build contracting while enriching academic discourse on the topic of project delivery with the theoretical depth available from the literature of new institutional economics.

**Work Completed to Date:** We have reviewed previous work on the topic and begin data assembly and analysis.

**Papers to Date:**

None to date

**Conferences Attended:**

None to date

**Other Accomplishments:**

None to date

**Percent Complete:** 80%

**Direct Cost:** \$78,272

## **Activity-Oriented Scheduling/Activity Survey and Analysis Via a Unified Real-time Data Collection Framework**

### **Principal Investigator:**

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**External Project Contact:** All UCTC projects are co-sponsored by Caltrans. Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** In the previous research, we have developed a conceptual model of real-time activity scheduling/implementation data collection system. It is operationalized as a wearable computer complete with GPS recorder and wireless WAN card. The wearable computer features with real-time activity decisions tracking and activity pursuit recording in field. It gives the transport researchers a unique research means to identify the temporal-spatial decision making structure embedded in activity scheduling and study the linkage between activity decision-making and associated actual activity execution. This research will further improve the real-time system that incorporates the extraction of activity scheduling and execution information within one unified data collection framework with an up-to-date equipment and system functions; identify a unified conceptual ontology to explore and explain the dynamics and interaction of activity scheduling and execution, and explicitly define the mechanism in which the formulation of people's activity schedules are subject to the influence of the social-demographic and temporal-spatial constraints that gradually lead to the activity-travel patterns detailed by passive, observing survey methods.

**Key Words:** Real-Time Data Collection; Wearable Computer; Activity Behavior

**Objective:** To test and evaluate the potential for use of a real time wearable data collection system developed in a previous UCTC funded project.

**Tasks:** 1. To develop additional Pocket PC-based real time data collection devices 2. Collect data for 40 participants (in real time) of one week's daily activity patterns and to analyze the data.

**Milestones, Dates:** Official start date Aug. 1, 2004, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge. .

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** Should reduce or eliminate data loss (missed by surveys and post-hoc interviews)

**Work Completed to Date:** We have reviewed previous work on the topic and have assembled needed data.

Analyses are underway. .

**Papers to Date:**

None to date

**Conferences Attended:**

None to date

**Other Accomplishments:**

None to date

**Percent Complete:** 65%

**Direct Cost:** \$20,000 (seed funding)

## **Wet Pavement Accidents on California Highways: Causes, Concentrations, and Potential Means for Reduction**

### **Principal Investigator:**

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**External Project Contact:** All UCTC projects are co-sponsored by Caltrans. Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** This research involves an a statistical analysis of accidents that have recently occurred on California Highways during inclement weather. There are well-known countermeasures for reducing the number and severity of wet pavement accidents, and the key is to identify where to apply each countermeasure to achieve maximum benefit. Caltrans already has processes in place for identifying treatment projects, and this research begins by becoming familiar with these procedures and their supporting data. Working together with Caltrans, a sample of roadway segments of the California State Highway System will be chosen and an historical dataset will be developed by combining accident data with detailed roadway characteristics, weather conditions, and traffic. The analysis phase will then focus on determining how the propensity for accidents (by type and severity) is related to roadway geometrics, pavement factors, and the weather and traffic conditions prevailing at the time of each crash. The final phase of the project will focus on means of integrating the new results into performance monitoring and planning procedures.

**Key Words:** Traffic accidents, highway safety, wet pavement, accident reduction

**Objective:** better process for identifying projects that improve roadway safety under conditions of wet pavements.

**Tasks:** Process Review; Select a Sample of Roadway Sections; Gather Data on Roadway Characteristics and Weather Conditions; Match with Accident Data; Analyze Relationships Among Accidents, Weather, Roadway Characteristics and Traffic Flow; Compare Notes with Caltrans Personnel to Interpret Results

**Milestones, Dates:** Official start date Aug. 1, 2004, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge.

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** This project is intended to aid Caltrans and other State Federal and State Agencies in identifying problems related to traffic safety during wet weather conditions and it is intended to provide guidelines for designing countermeasures to reduce the number and severity of traffic accidents.

**Work Completed to Date:** We have reviewed previous work on the topic and have assembled needed data. Our analyses are underway. .

**Papers to Date:**

None to date

**Conferences Attended:**

None to date

**Other Accomplishments:**

None to date

**Percent Complete:** 75%

**Direct Cost:** \$66,814

## The Davis Bicycle Studies

### Principal Investigator:

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**External Project Contact:** All UCTC projects are co-sponsored by Caltrans. Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** As a means of transportation and as a form of physical activity, bicycling generates benefits to the bicyclist as well as to the community as a whole. Bicycling now accounts for less than 1 percent of all trips for all purposes in the U.S., but evidence from other western countries suggests that under the right conditions, bicycling levels can be significantly higher. The experience of Davis, California suggests that it is possible to create conditions conducive to higher levels of bicycling in the U.S. However, the extent to which public policies have contributed to bicycling levels in Davis has not been rigorously assessed. This project aims to fill that gap through a quasi-experimental study of bicycling behavior in Davis and comparison communities designed to determine the influence of bicycle infrastructure and mixed land-use patterns relative to individual preferences, community culture, and other factors. To provide a policy context for the behavioral analysis, the project will document the history of bicycle policy in Davis and compare bicycle infrastructure in Davis to other bicycle-oriented college towns. This project is planned as the first in a series of complementary studies of bicycling behavior focused on Davis.

**Key Words:** bicycling, bicycling behavior, bicycle policy, bicycle infrastructure, mixed land use patterns, preferences, culture

**Objective:** The objective of this project is to rigorously assess the extent to which public policies have contributed to bicycling levels in Davis using a quasi-experimental design.

### Tasks:

1. Literature review,
2. Development of the survey instrument,
3. Development of sample,
4. Implementation of survey,
5. Analysis of survey data,
6. Historical review of Davis policies,
7. Inventory of infrastructure and policies,
8. Final report

**Milestones, Dates:** Official start date Aug. 1, 2004, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge.

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** This project will contribute to a stronger empirical basis for policy decisions about bicycle infrastructure.

**Work Completed to Date:** Tasks 1-3; 4 is underway.

### Papers to Date:

None to date

### Conferences Attended:

None to date

### Other Accomplishments:

None to date

**Percent Complete:** 60%

**Direct Cost:** \$20,000

## Testing Spatial Mismatch: A Structural Equations Modeling Approach

### Principal Investigator:

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**External Project Contact:** All UCTC projects are co-sponsored by Caltrans. Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** We critique past studies of the Spatial Mismatch Hypothesis and then apply three structural equations models to data for the Sacramento, California region. We estimate both cross-sectional and dynamic models and use a network-based travel model to measure accessibility to jobs.

**Key Words:** Spatial Mismatch, structural equations models, cross-sectional and dynamic models, accessibility to jobs.

**Objective:** The objectives of this study are to: 1. examine the relations between employment, auto ownership, income, job accessibility, and other variables using structural equations models; 2. to test whether simultaneity exists; and 3. to determine if simultaneity results in biased estimates, by comparing these results to those from multiple regression models.

**Tasks:** 1. Develop two multiple regression models by using pooled data, whites only, and blacks only, on 1990 and 2000 datasets as comparison bases. 2. Develop separate cross-sectional structural equations models for 1990 and 2000 for pooled data, whites only, and blacks only. 3. Compare the models developed in Task 1 and Task 2. 4. Develop unconditional change-score structural equations models for pooled data, whites only, and blacks only. 5. Develop two-wave structural equations models for pool, whites only and blacks only.

**Milestones, Dates:** Official start date Aug. 1, 2004, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge. .

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** To our best knowledge, we will be the first researchers to use a dynamic non-recursive structural equations model to test spatial mismatch.

**Work Completed to Date:** We have reviewed previous work on the topic and have critiqued it; specification and estimation of models is underway.

### Papers to Date:

None to date

### Conferences Attended:

None to date

### Other Accomplishments:

None to date

**Percent Complete:** 80%

**Direct Cost:** \$38,756

## Street Trees and Intersection Safety

### Principal Investigator:

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**External Project Contact:** All UCTC projects are co-sponsored by Caltrans. Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** For at least 250 years, the finest streets the world over have been associated with trees.. In the automobile age, safety concerns have resulted in tree spacing standards in the United States that dictate long setbacks from intersections, ostensibly geared to achieving unobstructed sight lines for drivers. The premise of this research is that street trees should not be restricted unless it can be shown unequivocally that they create unsafe environments. The research investigates how California communities interpret engineering guidelines on tree placement and uses new three-dimensional computer modeling, drive through animation techniques, and Geographic Information Systems tools to model and analyze a variety of typical urban intersections. We conduct controlled experiments to ascertain what drivers notice at intersections.

**Key Words:** Intersection design, street standards, street trees

**Objective:** Use three-dimensional modeling techniques and GIS spatial analysis tools to test whether street trees near intersections significantly block visibility.

**Tasks:** 1: Gather street design standards from California cities analyze restrictions on street trees and other objects at intersections; compile the data in tabular form. 2: Create three-dimensional computer models of typical urban intersections where a minor road intersects with a major road. Create versions without and without street trees, with and without parked cars, and combinations of each. 3: Create snapshot images of what a driver on the minor road would see when stopped at each simulated intersection, looking to the left and to the right. Import these images into a GIS spatial database, and calculate areas of visibility. 4: For each modeled intersection, create a drive-through simulation that represents what a driver would see when moving along the minor road, stopping at the intersection, and scanning the roadway. 5: Conduct controlled experiments in which participants view the drive-through simulations and indicate when they notice approaching cars; analyze the data. 6: Gather accident data for Oakland, CA, and analyze correlation between high accident rates and intersection street trees. 7: Prepare a final report

**Milestones, Dates:** Official start date Aug. 1, 2004, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge.

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** Better policies on street trees at intersections; better methods for studying the topic.

**Work Completed to Date:** We have reviewed previous work on the topic, and assembled data. Model development is underway.

**Papers to Date:**

None to date

**Conferences Attended:**

None to date

**Other Accomplishments:**

None to date

**Percent Complete:** 75%

**Direct Cost:** \$47,113



## **Robust Optimal Maintenance and Rehabilitation Policies in Asset Management**

### **Principal Investigator:**

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**External Project Contact:** All UCTC projects are co-sponsored by Caltrans. Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** Robust optimization is a modeling methodology to solve optimization problems in which the data are uncertain and only known to belong to some uncertainty set. The proposed research will use this modeling methodology to obtain robust maintenance and rehabilitation (M&R) policies for individual infrastructure assets. Using field and laboratory data, alternative methods will be used to characterize the uncertainty with regards to infrastructure facility deterioration. By considering the defined uncertainty set, a robust counterpart of the original infrastructure maintenance problem will be created. Efficient solution algorithms will be developed to solve the robust counterpart or good approximations thereof. Finally, case studies will be performed to evaluate the usefulness of the proposed approach in reducing M&R expenditures. The proposed research is the first adaptation of robust optimization methods to asset management. The research will also contribute to the literature on robust dynamic programming in the context of Markov decision processes. The results of this research will improve the confidence of public works agencies in asset management systems and thus facilitate the acceptance and deployment of these systems.

**Key Words:** Robust optimization, uncertainty set, maintenance and rehabilitation, infrastructure assets, asset management, Markov Decision Process.

**Objective:** The objective of this research is to develop a prototype of an asset management system that uses robust optimization to produce M&R policies that are less sensitive to the input data.

**Tasks:** Literature review; Infrastructure facility uncertainty modeling (for highway pavements); Investigation of alternative uncertainty models; Formulation and solution of robust optimization problem; Extension to infinite horizon problems

**Milestones, Dates:** Official start date Aug. 1, 2004, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge.

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** The proposed research has the potential to reduce the costs associated with errors in modeling deterioration rates while managing infrastructure assets, which will help realize the full potential of asset management systems and thus facilitate the acceptance and deployment of these systems by public agencies.

**Work Completed to Date:** We have reviewed previous work on the topic and have done most data assembly; analysis is underway.

**Papers to Date:**

None to date

**Conferences Attended:**

TRB 2005

**Other Accomplishments:**

None to date

**Percent Complete:** 75%

**Direct Cost:** \$42,735

## Modeling the Adoption of Teleshopping

### Principal Investigator:

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**External Project Contact:** All UCTC projects are co-sponsored by Caltrans. Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** Fully understanding the potential transportation impacts of new and old shopping alternatives requires investigating the adoption of the various alternatives. This multi-year study proposes to design, administer, and analyze an original survey of shopping attitudes and behavior, leading to a model of shopping mode choice. To reduce the heterogeneity of shopping behavior, we focus on one or two frequently-purchased product classes. We define alternatives in terms of the dimensions of pre-purchase behavior (with store, catalog, and Internet modes) and transaction behavior (store, phone, mail, and Internet modes, distinguishing auction sites from conventional e-tailers). Research questions include: (1) For the selected product class(es), what are the advantages and disadvantages of each shopping mode? (2) Can market segments with different propensities to use alternative modes be identified? (3) To what extent are there perceived to be viable alternative modes for a given shopping occasion? (4) Are the various shopping modes substitutes, or complements? Offering the option of paper or web-based surveys, we plan to obtain about 2,000 responses. The first year of the study is mostly devoted to survey design, data collection, and cleaning, with some preliminary descriptive analyses. Future years will involve various multivariate statistical analyses and multidimensional discrete choice modeling.

**Key Words:** shopping mode choice, teleshopping, e-shopping adoption, B2C e-commerce

**Objective:** To better understand the circumstances under which the alternative shopping modes of store, catalog, and Internet are chosen, which has implications for the future transportation impacts of teleshopping.

**Tasks:** 1. Literature review: ongoing; 2. Survey design, paper and Internet versions: August 04 – January 05; 3. Sample extraction and recruitment: November 04 – January 05; 4. Administer survey: February 05; 5. Data entry and cleaning (paper surveys): March – April 05; 6. Initial descriptive analyses: May – June 05; 7. Write up findings: July 05

**Milestones, Dates:** Official start date Aug. 1, 2004, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge. .

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** Increased insight into individual responses to ICT-based shopping alternatives, having direct travel and indirect urban form implications.

**Work Completed to Date:** We have reviewed previous work and have completed data assembly . Analysis is underway..

**Papers to Date:**

None to date

**Conferences Attended:**

TRB 2005

**Other Accomplishments:**

None to date

**Percent Complete:** 70%

**Direct Cost:** \$81,379

## Estimating Activity Rates and Emissions from Heavy-Duty Construction Equipment

### Principal Investigator:

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**External Project Contact:** All UCTC projects are co-sponsored by Caltrans. Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** The proposed research will help Caltrans estimate emissions from transportation project construction activities. The research will expand upon existing work at UC Davis (UCD) to develop a construction emissions spreadsheet tool. Using construction diaries created by Caltrans, the research team will estimate a range of construction equipment activity for six project types representative of virtually all of the transportation projects completed by Caltrans. In addition, the research team will synthesize existing literature regarding estimating construction activity, and provide guidance for project analysts charged with estimating emissions from specific projects. The work products will illustrate how to use construction equipment activity data to estimate emissions, using a new construction emissions spreadsheet tool developed by UCD under Caltrans sponsorship. Air quality management districts recognize the growing importance of non-road mobile source emissions, and are increasingly asking Caltrans to estimate emissions from non-road equipment. The research will enable Caltrans to respond to these information requests, and to test the sensitivity of emissions estimates to various project elements.

**Key Words:** non-road activity, construction emissions, non-road inventory

**Objective:** To estimate a range of construction equipment activity for six project types representative of virtually all of the transportation projects completed by Caltrans.

**Tasks:** 1) Interview Caltrans staff & identify representative projects; 2) Define projects to be evaluated; 3) Obtain and evaluate construction diaries; 4) Analyze and evaluate construction activities; 5) Summarize existing resources; 6) Update construction emissions modeling spreadsheet; and 7) Prepare guidance document

**Milestones, Dates:** Official start date Aug. 1, 2004, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge. .

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** The project work products will, for the first time, document the range of equipment activities associated with transportation construction projects undertaken in California.

**Work Completed to Date:** We have completed tasks 1-5 and are working on 6.

**Papers to Date:**

None to date

**Conferences Attended:**

TRB 2005, 2006

**Other Accomplishments:**

None to date

**Percent Complete:** 80%

**Direct Cost:** \$47,082

## **Modeling Car Ownership Rates, and Age and Value of Vehicles**

### **Principal Investigator:**

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**External Project Contact:** All UCTC projects are co-sponsored by Caltrans. Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** This study develops new approaches to modeling car ownership rates, and the age profile and average value of the automobile stock using aggregated data for small geographic units (census tracts or zip-code areas). This type of information is critical to large-scale urban transportation models and models of air pollution from mobile sources. Ideally, these models should be based on understanding the underlying causal factors that determine the number and characteristics of household vehicles. Current models using census data are limited to ownership rates without the ability to examine age and value, and the current analytical approach has a serious econometric problem with the endogeneity of household income as a dependent variable. This study overcomes these limitations by combining census data with non-census data, and by using an instrumental variable approach to examine variations across tracts or zip-code areas in Los Angeles County. Socioeconomic and demographic characteristics come from the 2000 census, the exogenous cost of car ownership comes from insurance quotes, and the age and value information is based on a special tabulation of data from the Department of Motor Vehicles.

**Key Words:** car ownership, age and value of cars, instrumental-variable approach

**Objective:** The research objective of the proposed study is to estimate three equations using an instrumental-variable approach – automobile ownership rate, the proportion of the vehicle stock over ten years old, and the average value of the vehicle stock.

**Tasks:** Assemble data, analyze the data, write up the results.

**Milestones, Dates:** Official start date Aug. 1, 2004, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge. .

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** This research will provide develop insights that will ultimately enhance key components of transportation and pollution models, and will enable policy analysts better able to examine what factors can be influence to enhance transportation resources for households.

**Work Completed to Date:** We have completed the literature review, data assembly, and preliminary modeling.

**Papers to Date:**

None to date

**Conferences Attended:**

None to date

**Other Accomplishments:**

None to date

**Percent Complete:** 80%

**Direct Cost:** \$49,748

## Capacity Modeling for Large Scale Urban Multimodal Freight Transportation Systems

**Principal Investigator:**

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**External Project Contact:** All UCTC projects are co-sponsored by Caltrans. Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** This research is designed to develop an analysis tool that can estimate the capacity of multimodal freight transportation systems. Lack of sufficient capacity for freight transportation is increasingly becoming a major issue in metropolitan areas throughout the United States, particularly in Southern California. In supporting economic expansion goals, it is important to consider how transportation investments can sustain the continued growth of the economy. Traditional approaches to capacity preservation and expansion, especially in urban areas, have proven to be inadequate, mainly due to the high cost of land use, environmental concerns, physical barriers, and opposition from local communities. There is broad recognition of the need for comprehensive multimodal approaches that leverage the competitive advantages of each mode. Existing methods for capacity analysis, however, do not adequately address the distinct features of multimodal systems. Because of the complexity relevant to multimodal plans and projects, new methods to evaluate current usage and potential capacity of multimodal systems are desired to be developed. The model we intend to develop would assist transportation planners and infrastructure managers in making the most efficient use of existing capacity and in improving their decision-making related to transportation planning and investment.

**Key Words:** Intermodal Freight Transportation System, Capacity Modeling, Multiple Commodity Network Flow Problems

**Objective:** To develop new capacity modeling tools.

**Tasks:** 1) A comprehensive literature survey and gap analysis will be conducted with the relevant references and guidance materials in order to improve our knowledge baseline on multimodal freight transportation systems and capacity analysis. 2) A mathematical formulation and algorithm will be developed in the second phase 3) The reasonableness and applicability of the developed model will be tested and assessed.

**Milestones, Dates:** Official start date Aug. 1, 2004, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge. .

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** This research could develop useful planning tools and also provide insight into intermodal freight bottlenecks in the case study region.

**Work Completed to Date:** We have reviewed previous work on the topic as well as data assembly. Preliminary analyses have been conducted.

**Papers to Date:**

None to date

**Conferences Attended:**

TRB 2005, 2006

**Other Accomplishments:**

None to date

**Percent Complete:** 70%

**Direct Cost:** \$55,348

## **Cruising for Parking**

### **Principal Investigator:**

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**External Project Contact:** All UCTC projects are co-sponsored by Caltrans. Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** Where curb parking is cheaper than off-street parking but all curb spaces are occupied, drivers who want to park their cars are presented with a choice: they can spend time cruising for curb parking or spend money to park off-street. Since curb parking is under priced, drivers have an incentive to search for curb spaces. Cruising is individually rational but collectively harmful because it increases traffic congestion, air pollution, fuel consumption, and accidents. In the proposed research, we will study the effects of cruising for under priced curb parking. We will measure the time it takes to find a curb space in Westwood Village, a commercial district adjacent to the UCLA campus, and estimate the share of traffic that is cruising for parking. From these findings we will measure the congestion effects directly related to under priced curb parking. To accomplish these objectives, we will examine the following: 1) the average cruising time before finding a vacant curb space, 2) driver's strategies in cruising for parking 3) the average parking duration at curb spaces, 4) the share of traffic that is cruising for parking, and 5) the transportation improvements that would occur if cruising were reduced by correctly pricing curb parking.

**Key Words:** parking, cruising, congestion

**Objective:** To quantify the effect of under priced curb parking

**Tasks:** Review previous work on the topic, assemble data, analyze data, and prepare reports.

**Milestones, Dates:** Official start date Aug. 1, 2004, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge. .

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** improved understanding of driver behavior when parking - greater understanding of the dynamics of curb parking

**Work Completed to Date:** We have reviewed previous work on the topic and have undertaken data assembly. Analysis is well underway.

**Papers to Date:**

Access article

**Conferences Attended:**

Lake Arrowhead 2004, 2005; TRB 2005, 2006

**Other Accomplishments:**

None to date

**Percent Complete:** 80%

**Direct Cost:** \$53,978

## Why Do Inner City Residents Pay Higher Premiums? The Determinants of Automobile Insurance Premiums

### Principal Investigator:

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**Abstract:** This study examines the relationship between traffic density, vehicular accident and automobile insurance premiums across sub-metropolitan areas. It is widely known that inner city residents pay higher premiums, holding car characteristics constant, than others, but there is very little systematic research to explain why. We propose to disentangle two competing explanations for these higher premiums: the higher rates are the product of racial discrimination (“red lining”), and the higher rates are due to a higher cost for insuring inner-city residents as a result of their greater risk. Here we examine whether inner city residents are exposed to greater vehicle risks and whether these greater risks can account for their higher premiums. These risks include greater exposure to automobile accidents because metro area vehicle traffic is much more dense there than elsewhere, and greater exposure to high crime neighborhoods (higher car theft risks), among other factors. The study uses multivariate econometric models to test these hypotheses, after accounting for other relevant factors. The analysis examines variations across small geographic areas within Los Angeles City using both census and non-census data. This topic is important because the recent literature has shown that higher insurance premiums adversely impact inner city residents’ ability to purchase and maintain cars, which in turn has been shown to have an important influence on their ability to gain employment.

**Key Words:** Auto Insurance, Redlining, Vehicle Accidents, Inner city residents

**Objective:** To improve understanding of the factors that account for the higher auto insurance premiums paid by inner city residents.

**Tasks:** assemble and geocode data, analyze data, prepare research report

**Milestones, Dates:** Official start date Aug. 1, 2004, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC’s Website and distributed in hard copy, in most instances free of charge. .

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** This research will provide greater insight into the potential barriers to car ownership of inner city residents, which in turn could improve their employment opportunities

**Work Completed to Date:** We have reviewed previous work on the topic and begin data assembly. Some analysis has also been done..

**Papers to Date:**

None to date

**Conferences Attended:**

None to date

**Other Accomplishments:**

None to date

**Percent Complete:** 70%

**Direct Cost:** \$47,305

## Motor Fuel Price and Expenditure Effects on Vehicle Use in California

### Principal Investigator:

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**External Project Contact:** All UCTC projects are co-sponsored by Caltrans. Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** Motor vehicle fuel costs lie at the intersection of several national transportation policy debates. Transportation efficiency and equity concerns are a common thread in these debates. They include how best to reduce gasoline consumption; how to understand rising personal mobility costs and burdens on low income households; and how to address the quiet revolution in the nation's transportation finance system, shifting from user fees to general taxes and borrowing to support investment. A clear understanding of how vehicle fuel prices and household fuel expenditures affect household transportation choices and costs would shed needed light on these discussions and related policy choices. New data collected by the 2001 National Household Travel Survey provide far better estimates of household vehicle fuel economy, annual fuel expenditures, and vehicle miles traveled than data available previously. This study uses the NHTS data to: 1. identify variation in fuel prices and annual household fuel expenditures; 2. estimate the value of specific household trip types; 3. model the price sensitivity of demand for fuel among California households; and 4. suggest how different policy alternatives, including a potential motor fuel tax increase, could affect fuel consumption, vehicle acquisitions and travel among California households.

**Key Words:** National Household Travel Survey, Fuel Price, Fuel Expenditure Fuel Tax, Equity

**Objective:** study how vehicle fuel prices and household fuel expenditures affect household transportation choices and costs and identify policy implications

**Tasks:** 1. Analysis of variation in fuel prices and household fuel expenditures; 2. estimation of trip costs and value of specific trip types; 3. model of price sensitivity of demand for fuel; 4. discussion of policy alternatives, including a motor fuel tax increase, and effects on fuel consumption, vehicle acquisitions and travel among California households.

**Milestones, Dates:** Official start date Aug. 1, 2004, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge. .

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** The project will provide a more reliable picture of variation in household fuel expenditures and fuel prices than previously available. Comparing fuel expenditures with household and driver demographic information as well as with trip characteristics will allow for a nuanced view of how different households and drivers value different trips and of the price elasticity of demand for trips and travel in the face of fuel price increases.

**Work Completed to Date:** We have reviewed previous work on the topic, assembled the data, and begun our analysis.

**Papers to Date:**

None to date

**Conferences Attended:**

Lake Arrowhead 2004, TRB 2005

**Other Accomplishments:**

None to date

**Percent Complete:** 75%

**Direct Cost:** \$20,000



## Status Reports –Year 18

Abstracts for the nine new projects initiated in Fall 2005 are presented below. All new projects were initially given only seed funding when the first increment of federal and funds arrived on campus. **Additional funding is being provided in Spring and/or Fall 2006. As a result, no project is more than 25% complete and all projects have been given a 2007 end date. The budgets shown here are the full amounts that will be provided, not the amounts received to date.**

### **An Empirical and Theoretical Study of Freeway Weave Analysis**

#### **Principal Investigator:**

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**Abstract:** A major source of freeway bottlenecks is driver lane-changing activity at freeway weaving sections formed when an on-ramp is followed closely by an off-ramp. Current methods for analyzing traffic conditions on these types of sections do not reproduce empirical observations well and have produced inconsistent results. More than half a century after the first publications, there is still no consensus on which, if any, of the existing weaving analysis methods is reliable. This research proposes an alternative approach to study weaving phenomena, based on recent theoretical findings and empirical experiments which uncovered mechanisms of driver lane change behavior that cause the reduction in freeway system capacity. We have developed a parsimonious extension to the kinematic wave theory (the multilane hybrid model) that reproduces this behavior by explicitly incorporating the effects of lane-changing maneuvers. Here we will develop a new for predicting weaving section capacity based on the cause and effect mechanisms that govern this type of bottleneck. **Key Words:** freeway bottlenecks, lane-changing, freeway weaving sections, field experiments, kinematic wave theory

**Objective:** To test a new theory for better understanding the operation of freeway weaving sections and developed a new method for analysis.

**Tasks:** Review the state of the art in weaving analysis. Fully document limitations and inconsistencies reported in the literature. Collect and process high-fidelity data at least 3 freeway sites. Develop a new weaving analysis method based on the team's findings on the connection between lane changes and traffic congestion.. Prepare a final report.

**Milestones, Dates:** Official start date Aug. 1, 2005, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge.

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** This would be the first theory/method able to replicate real-world observations on weaving section operations.

**Direct Cost:** \$73,966

## **Freeway Deconstruction and Urban Renewal: Land Market and Transportation Impacts**

### **Principal Investigator:**

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**Abstract:** Freeway “deconstruction” in places like San Francisco, Portland, and Milwaukee marks an abrupt shift in urban priorities, away from designing cities to enhance mobility toward promoting economic and environmental sustainability, livability, and social equity. This project will investigate the economic trade-offs and distributional implications of freeway demolitions, drawing from case-study experiences and quantitative analyses. Case-study work will probe the institutional and planning contexts of freeway removals based on experiences with the Park East Freeway in Milwaukee and the Central Freeway in San Francisco. The quantitative analyses will focus on San Francisco’s two notable yet different freeway demolitions – the Embarcadero Freeway and Central Freeway. For the Embarcadero corridor, matched-pair methods will be used to investigate pre- and post- changes in commercial real-estate market conditions, including vacancy rates and average rents relative to downtown comparison areas (beyond the freeway impact zone). For the Central Freeway corridor, matched-pair methods will be used to study changes in residential sales values between nearby neighborhoods and otherwise similar ones off the freeway corridor. Matched-pair comparisons will also be used to study changes in roadway levels of service, delays, and pedestrian accident rates for major streets and intersections impacted by the Central Freeway demolition.

**Key Words:** Freeway; Economic Development; Land Market Impacts; Safety; Level-of-Service; Hedonic Price Modeling; Matched-Pair Comparisons; Case Studies.

**Objective:** To evaluate the impacts of freeway demolitions on the land markets and economic standing on affected neighborhoods as well as on traffic and safety conditions

**Tasks:** conduct a literature review; conduct case study in San Francisco and Milwaukee, using secondary sources and conducting interviews with stakeholders; obtain data on land-use changes in affected corridors; acquire residential and commercial real-estate market data; conduct matched-pair comparisons of changes in property values and other real-estate market performance indicators between impacted neighborhoods and control sites; estimate hedonic price models; compile traffic and accident data before and after freeway removals; measure impacts on highway levels of service, accident levels, and distribution shifts (by mode and route); synthesize the findings and assess policy recommendations and responses; prepare article summarizing key research findings.

**Milestones, Dates:** Official start date Aug. 1, 2005, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC’s Website and distributed in hard copy, in most instances free of charge.

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** Gauge the impacts of freeway removals on economic development and land markets of affected communities as well as traffic performance and safety levels, probing net efficiency versus distribution-equity implications.

**Direct Cost:** \$52,592

## **How Much Do Low Income And Foreign-Born Households Use Public Transportation?**

### **Principal Investigator:**

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**External Project Contact :** All UCTC projects are co-sponsored by Caltrans, Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** At one level the answer to this question is an unqualified “a great deal” - of course low-income populations use public transportation. How else would many of these workers get to their jobs? And, there is an implicit, and often explicit, sense that cities need to provide increased public transit and access to that transportation for low-income populations. However, recent research and commentary has raised questions about the use of public transportation by low-income populations. Studies of mostly welfare population have suggested that while public transportation is not unimportant, the car is a much more critical factor in moving from welfare to work. This paper conducts research with a detailed geo-coded data set to examine the low-income population in general and the foreign born population in particular. How much do low-income households in the Los Angeles metropolitan area use public transportation in their journey to work, schools and other activities? Are the foreign-born population particularly intensive users of public transportation and can we determine the relative trade-off of public transit and car use by these households? The study will extend previous studies that were targeted to specific welfare populations, to the low-income population at large.

**Key Words:** journey to work, public transportation, low-income populations, foreign-born populations

**Objective:** To evaluate the relative role of transit and auto use by low-income populations.

**Tasks:** (a) Using logistic regression to estimate the probability of being employed or becoming employed as a function of car versus transit use for individual households, (b) evaluating the use of transit by residential location.

**Milestones, Dates:** Official start date Aug. 1, 2005, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC’s Website and distributed in hard copy, in most instances free of charge.

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** The study will generalize and confirm, or question, earlier studies which have suggested that transit use does not significantly benefit welfare to work transitions.

**Direct Cost:** \$52,119

## **A Spatial Analysis of Self-serving and Altruistic Travel Behavior**

### **Principal Investigator:**

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**External Project Contact :** All UCTC projects are co-sponsored by Caltrans, Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** Formulation and specification of activity and travel analysis models require better understanding of time allocation behavior. This is particularly important when studying time allocation of persons in joint activities and travel. However, very little is known about the perceived selfish and altruistic behavior and how this relates to travel behavior in time and space. In this project we attempt to offer a first analysis using structural equations models and data from a special type of activity participation diaries. The data from these diaries are detailed lists of activities pursued, times spent in each activity, and travel information from activity to activity (including travel time, mode used, and so forth) linked to individual and household characteristics. We also use detailed information about the persons that were served by the activity of each participant. The analysis will identify the correlation structure underlying behavioral indicators such as amount of time and frequency of activity and travel episodes for family and friends as well as for self-serving reasons. Then, the temporal and spatial relationships with activity participation and travel with others and alone as well as modal split will also be studied and correlated with altruistic and self-serving behaviors.

**Key Words:** activity and travel behavior, egoistic and altruistic behavior, modal split

**Objective:** Create a model system that explains modal split as a function of altruistic and self-serving behavior.

**Tasks:** Task 1: Develop First Model Set (October 1, 2005 to January 30, 2006); Task 2: Develop Second Model Set (January 31, 2006 to May 15, 2006); Task 3: Write report and papers for publication (August 1, 2005 to July 31, 2006)

**Milestones, Dates:** Official start date Aug. 1, 2005, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge.

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** Achieve better understanding of travel behavior to design better policies favoring environmentally friendly modes.

**Direct Cost:** \$64,447

## **Emission and Air Quality Impacts of New Diesel Engine Control Technologies**

### **Principal Investigator:**

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**External Project Contact :** All UCTC projects are co-sponsored by Caltrans, Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** Diesel engines are now responsible for half or more of the total nitrogen oxide (NOx) and exhaust particulate matter (PM) emissions from on-road vehicles nationally. There has been recent progress in developing control technologies such as selective catalytic reduction, lean NOx traps, NOx storage catalysts, and diesel particulate filters. Although these technologies have not yet been widely deployed in on-road vehicles, their use will soon be required due to new heavy-duty engine emissions standards that will take effect in the U.S. starting with the 2007 model year. In this research, we will review control technologies available for future use, assess control efficiency, cost, durability and robustness in service, and the potential for undesirable side-effects on exhaust emissions. Emissions estimates will be developed for historical, current and future year scenarios that span a 20-year time period. We will use a 3-D photochemical model to predict the effects of changes in vehicle emissions on air pollution levels in the Los Angeles area.

**Key Words:** air pollution, diesel, emission controls, nitrogen oxides, particulate matter

**Objective:** Assess changes in emissions and air quality likely to occur in the next 10 years due to new emission control requirements for diesel engines.

### **Tasks:**

1. Review of new diesel exhaust control techniques
2. Estimate emissions for historical, current, and future year scenarios
3. Assess air quality impacts of changing emissions in the Los Angeles area

**Milestones, Dates:** Official start date Aug. 1, 2005, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge.

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** Quantify expected improvements in air quality over the next decade as a result of major investments in diesel emission control technologies.

**Direct Cost:** \$44,834

## Life-Cycle Environmental Assessment of Passenger Air and Rail Transportation

### Principal Investigator:

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**External Project Contact :** All UCTC projects are co-sponsored by Caltrans, Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** Heavy rail and air passenger transportation modes are critical systems relied upon for business and leisure. When considering their environmental effects, most studies focus on the fuel use of the vehicles, and ignore the energy and other resource inputs and environmental outputs from the life cycles of involved infrastructures, fuels, and vehicles. The goal of this project is to develop comprehensive life-cycle assessment (LCA) models to quantify the energy inputs and emissions from heavy rail and air transportation in the U.S. associated with the entire life cycle (design, raw materials extraction, manufacturing, construction, operation, maintenance, end-of-life) of the infrastructures, fuels, and vehicles involved in these systems. A computer-based decision-support tool will be created to aid the decision-making process and applied to a pending case.

**Key Words:** air transportation, rail transportation, energy, emissions, environment, life-cycle assessment

**Objective:** Develop comprehensive life-cycle assessment (LCA) models to quantify the energy inputs and emissions from heavy rail and air transportation in the U.S. associated with the entire life cycle (design, raw materials extraction, manufacturing, construction, operation, maintenance, end-of-life) of the infrastructures, fuels, and vehicles involved in these systems.

**Tasks:** *Literature research* – Review the composition of and data on the infrastructure serving air and heavy rail transportation, energy inputs, emissions data from each life-cycle phase, fuel use by these transportation modes, details of the fuel cycle, end-of-life treatment of infrastructure and vehicles. *Develop LCA models* – Identify processes to be analyzed by LCA for the infrastructures, fuels, and vehicles in heavy rail and air transportation. A hybrid LCA model for each of these modes will be newly developed. *Collect data* -- Collect data from literature, air and rail transportation organizations, the Ecoinvent database, and EIO-LCA. *Develop computer-based decision-support tool* -- Based on the theoretical models and the data collected, an MS Excel-based computer tool will be developed in order to aid environmental analysis and enable the comparison of air and rail transportation modes with different sets of data for various decision-makers. We will design this tool to be expandable to analysis of other transportation modes in the future. *Case study* -- Apply the developed LCA model to a case study, most likely to the proposed Los Angeles-San Francisco high-speed rail line.

**Milestones, Dates:** Official start date Aug. 1, 2005, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge.

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** Better environmental data and methods (decision support) for assessing modes

**Direct Cost:** \$47,444

## **The Effect of In-Transit WiFi Internet Access on The Value of Travel Time Implications for Mode-Choice Models**

### **Principal Investigator:**

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**Abstract:** This study explores the effect on valuation of passenger travel time (VOTT), of providing of wireless internet access (WiFi) on public transportation modes. Specifically, we aim to formulate a model of the effect of WiFi on trains on time value and eventually on market share.

VOTT is the amount that a passenger would pay to reduce travel time by unit quantity. Amenities that enhance possibility of other activities during travel reduces the disutility of travel time, subsequently reducing VOTT. For most work and leisure activities, of internet access during the commute enhances the quality and productivity of work and leisure activities performed during travel.

Utility maximizing mode choice models may be used for quantify the effect of WiFi on VOTT and on market share. In these models, the ratio of the Lagrangean multipliers of the travel time and income constraints results in the same value of VOTT as the ratio between marginal utilities of time & cost estimated as part of modal utility in a discrete travel choice model. Internet access can then be modeled as an attribute in attribute specific choice models. The extent of reduction of VOTT can be used as a guideline for pricing WiFi on trains.

**Key Words:** Information Technology, Value of Time, Mode Choice, WiFi on Trains

**Objective:** Evaluate the effect of internet access in public transportation modes on the value of travel time and on mode choice.

### **Tasks:**

1. Theoretical Model Development
2. Data Assembly
3. Estimation of Time Values
4. Adapting Mode Choice Models for Internet Access Attributes

**Milestones, Dates:** Official start date Aug. 1, 2005, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge.

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** Understanding feasible business models for the provision of WiFi services on public transportation systems, and estimating the effect of that on market share.

**Direct Cost:** \$52,969

## **How Safe Is the Ride? Evaluation of Design and Policy Responses to Women's Fear of Victimization in Transportation Settings**

### **Principal Investigator:**

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**Abstract:** The relationship between women's fear and the built environment has been the subject of much research, with findings that women feel unsafe in many locations. Cities have addressed this issue by implementing different programs to assess and remedy safety gaps in the built environment. However, little academic research has investigated this aspect of women's safety. Whether traveling by bus, automobile, or other mode, women's fear of transportation facilities – such as parking lots, buses, and bus stops – in turn affects the way women engage in travel. This study will focus on the safety concerns and needs of women riders, programs and activities U.S. transit operators have implemented to make their systems safer for women riders, assessments of the efficacy of these programs, and case studies of model programs targeting women's safety issues in transit environments. **Key Words:** Women, safety, transit travel

**Objective:** The objective of the research is to identify the needs of women groups regarding transit safety; assess if these needs are met by transit operators; and identify model programs and best practices from the U.S. and overseas that address women's concerns about safe transit travel.

**Tasks:** *Literature review:* Compilation of literature on women's fears and concerns about safety in public environments with a particular emphasis on transit settings. Documentation of programs and creation of an inventory of municipal policies in the U.S., Canada, Great Britain, and Australia that have as their explicit focus the safety of women in cities. *Interviews with representatives of women's groups in the U.S.,* such as the National Organization for Women, American Association of University Women, Center for Women Policy Studies, Coalition of Labor Union Women, Feminist Majority Foundation, League of Women Voters, National Council of Women's Organizations, etc. *Web-based survey of transportation agencies:* The survey will target all 259 U.S. transit agencies that according to the National Transit Database maintained by the Federal Transit Administration operate at least 50 vehicles in peak period service. *Case studies of model programs:* Selection of 3-5 case studies of international programs targeting women's safety issues in transit environments for in-depth study. *Report writing.* Discussion of research findings and compilation of best practices for making transit travel safer for women.

**Milestones, Dates:** Official start date Aug. 1, 2005, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge.

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** Development of policies and design recommendations for making transit travel safer for women

**Direct Cost:** \$43,095



## **Bottom-up Bridge Management System**

### **Principal Investigator:**

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**External Project Contact :** All UCTC projects are co-sponsored by Caltrans, Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** Infrastructure Management Systems support agencies in developing efficient policies to monitor, maintain, and repair deteriorating facilities in transportation infrastructure networks. In the case of bridges, two approaches exist for the optimization of resource allocation: top-down and bottom-up. In the top-down approach, the optimization is done first at the network level, which does not provide bridge-specific recommendations. In the bottom-up approach, the optimization is done first at the facility level. Current systems using a bottom-up approach present a major limitation: the optimization is done on a portion of the life cycle, which is equivalent to a short planning horizon. Also, current systems use time-independent deterioration models, which may not be appropriate. Here a Bridge Management System is proposed which would optimize the lifecycle maintenance while using time-dependent deterioration models and preserving bridge-specific details. A bottom-up approach can be used. Moreover, robust optimization techniques can be applied at the facility-level, in order to mitigate the epistemic uncertainty in the deterioration process. Recommendations for each component can be aggregated and selected to meet network-level constraints. It is expected that the proposed approach will provide the following benefits: long-term maintenance costs savings, improvement of long-term performance and mainstreamed maintenance management.

**Key Words:** Infrastructure Management Systems, Maintenance, Resource Allocation, Deterioration Models, Robust Optimization.

**Objective:** Development of a Bridge Management System that accounts for facility-specific attributes and system-level considerations

**Tasks:** *Literature Review:* An extensive literature review will be performed in two main directions, bridge component deterioration models and M&R optimization models. *Model formulation and solution:* This task is divided in three major subtasks: subtask 2a (general problem formulation), subtask 2b (deterioration model synthesis) and subtask 2c (optimization model development). *Extensions:* Two extensions to the model are proposed: simultaneous optimization of inspection and maintenance decisions (to address inherent uncertainty) and robust optimization (to address epistemic uncertainty). *Application Case-studies:* The methodology developed in the previous tasks of the research will then be implemented using data from existing bridges.

**Milestones, Dates:** Official start date Aug. 1, 2005, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge.

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** The product of the project will provide state DOTs a prototype for the next generation of Bridge Management Systems, which goes beyond the constraints of current systems.

**Direct Cost:** \$44,360

## **Estimating Potential Exposure to Diesel Truck Freeway Emissions in Southern California: A Methodology for Assessing Air Pollution Impacts of Goods Movement**

### **Principal Investigator:**

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UC Los Angeles

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**External Project Contact :** All UCTC projects are co-sponsored by Caltrans, Contact Sallybeth Scott, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** It is now well documented that air pollution and health impacts of diesel vehicle emissions are highly concentrated near major roadways. This study will develop a methodology to disaggregate the potential impacts of diesel truck traffic from all other traffic in order to characterize the geographic extent and magnitude of diesel pollutant impacts along freeways in Los Angeles County, with an emphasis on those freeways with a relatively large fraction of diesel truck traffic. Recognizing the potential benefits of expanding the goods movement capacity of the freeway system, this project will provide transportation planners and policy makers with a more comprehensive understanding of local pollutant impacts, and enhance their ability to develop informed and defensible strategies to avoid and mitigate adverse impacts of heavy-duty freight vehicles.

**Key Words:** air pollution, diesel truck traffic, emissions, goods movement, heavy-duty freight, local pollutant impacts

**Objective:** To develop a methodology to characterize the geographic extent and magnitude of diesel pollutant impacts along freeways that will inform strategies to avoid and mitigate adverse impacts of heavy-duty freight vehicles.

**Tasks:** Review Existing Studies; Collect, Assess and Compile Truck Count Data; Assign Truck Counts to a GIS Freeway Map System; Identify and Characterize Potential Air Pollution Impacts

**Milestones, Dates:** Official start date Aug. 1, 2005, end July 31, 2006

**Student Involvement:** Graduate Student Researcher

**Technology Transfer Activities:** Publications will be posted on UCTC's Website and distributed in hard copy, in most instances free of charge.

**Relationship to Other UCTC Research:** new project

**Potential Benefits:** This project will aid transportation and air quality agencies in assessing and evaluating the potential local air quality impacts of heavy duty diesel truck emissions immediately adjacent to goods movement freeway corridors.

**Direct Cost:** \$37,094

### C. PROGRAM FINANCIAL STATUS

It is the UCTC's longstanding policy to commit all funds authorized by our sponsors, the US Department of Transportation and the California Department of Transportation, in the year that they are authorized. Funds that are not fully expended in the year they allocated may be carried over into the next fiscal year with the permission of the UCTC Director. Carry-over funds remain committed to the categories to which they were initially allotted, except for Headquarters funds, which differ in some cases from amounts initially budgeted because of changes in salaries or expense items, or reallocations of administrative budget amounts to research and technology transfer accounts.

Our Year 18 - 2005-2006 funds came in two allocations. Both allocations are reported here. Please note that some funds transfers to projects have not yet been made and additional projects may be added during the spring term of 2006. The final allocations of 2005-2006 funds will be reported in our final report for Year 18. During this period we also will complete an audit of the matching Caltrans funds and reallocate any funds that remain unspent.

**Table 5. UCTC Year 18 (2005-2006) Allocations**

<b>ITEM</b>	<b>BUDGET</b>
Center Director Salary	75,000
Faculty Salaries	0
Administrative Staff Salaries	78,350
Other Staff Salaries	90,600
Student Salaries	275,000
Staff Benefits	57,469
<b>SUBTOTAL SALARIES AND BENEFITS</b>	576,419
Scholarships	704,500
Permanent Equipment	5,000
Expendable Property & Supplies	23,816
Domestic Travel	40,000
Foreign Travel	10,000
Other Direct Costs (Specify)	154,081
<b>Total Direct Costs</b>	937,397
<b>Facilities &amp; Admin. (Indirect) Costs</b>	46,184
<b>TOTAL COSTS</b>	1,560,000
Federal Share	780,000
Matching Share	780,000
<b>TOTAL AVAILABLE FUNDS (EST.)</b>	1,560,000

## APPENDIX. COMPLETED PROJECTS SINCE START OF GRANT

### 1- YEAR 12 (1999-2000) PROJECTS (20 PROJECTS)

**Induced Travel Demand: A Systems Analysis of Longer Term Impacts of Road Expansion**  
Robert Cervero, City and Regional Planning, Berkeley

**Measuring the Impact of the Internet on the Trucking Industry**  
Carlos Daganzo, Civil & Environmental Engineering, Berkeley

**Roadway Tunnel Measurements of Carbon and Nitrogen-Containing Air Pollutants**  
Robert Harley, Civil & Environmental Engineering, Berkeley

**Estimation of Latent Pavement Properties Using Condition Survey Data**  
Samer M. Madanat, Civil and Environmental Engineering, Berkeley

**Online Versus Rolling Horizon Algorithms for Dynamic Service Fleet Operations**  
Amelia Regan and Sandra Irani, Civil & Environmental Engineering

**Regional Transportation Infrastructure Finance in the U.S.**  
Martin Wachs, Institute of Transportation Studies, Berkeley

**Estimating Freeway Traffic Stream Modal Activities for Air Quality Modeling**  
H. Michael Zhang, Civil and Environmental Engineering, Davis

**The Transportation Behavior and Needs of Welfare Recipients**  
Evelyn Blumenberg, Public Policy and Social Research, Los Angeles

**New Highways and Urban Growth Patterns: Using Locally Weighted Regression to Measure the Development Impacts of the Orange County Toll Roads**  
Marlon Boarnet, Urban & Regional Planning, Irvine

**GPS-Based Data Handling for Activity Based Modeling**  
Reginald G. Golledge, Department of Geography, Santa Barbara

**Impacts of Shipping Changes on the Efficiency of the Freight Transportation Network**  
Tom Golob and Amelia Regan, Institute of Transportation Studies, Irvine

**The Effects of Urban Land Use Patterns on Household Trip-Making Behavior: An Empirical Analysis**  
John D. Landis, City & Regional Planning, Berkeley

**Putting Behavior in Household Travel Behavior Data: An Interactive GIS-based Survey Via the Internet**  
Michael G. McNally, Institute of Transportation Studies, Berkeley

**Measuring the Role of Transportation in Facilitating the Welfare-to-Work Transition**  
Paul M. Ong, Public Policy and Social Research, Los Angeles

**Development of Estimation Procedures for Activity-Based Model Forecasting**  
Will Recker, Institute of Transportation Studies, Irvine

**Evaluating a University Transit Pass Program**  
Donald Shoup, Institute of Transportation Studies, Los Angeles

**Journeys to Crime: Documentation and Evaluation of Crime Incidence on and around Railway Stations in Los Angeles**  
Anastasia Loukaitou-Sideris, Urban Planning, Los Angeles

**The Viability of Value Pricing Demonstrations**  
Kenneth Small, Institute of Transportation Studies, Irvine

**Greenhouse Gas Emissions Trading and the Transport Sector**  
Daniel Sperling, Institute of Transportation Studies, Davis

**Driving for Dollars: How the Politics of Finance Has Shaped the California Highway System**  
Brian D. Taylor, Urban Planning, Los Angeles

**University of California Transportation Center 4/06**

## **2 - YEAR 13 (2000-2001) RESEARCH PROJECTS (15 PROJECTS)**

### **Does Commuting Distance Matter? Commuting Tolerance and Residential Change**

William A.V. Clark, Geography, UCLA

### **An Evaluation of Local Option Transportation Taxes in California**

Professor Martin Wachs, Institute of Transportation Studies, UC Berkeley

### **Stationary Traffic Models and Freeway Geometry**

Michael Cassidy, Civil and Environmental Engineering, UC Berkeley

### **E-Commerce and the Efficiency of the California Freight Network: Perspectives of Shippers, Carriers and Third Party Logistics and Information Services Providers**

Thomas F. Golob and Amelia C. Regan

### **Assessing the Influence of Residential Location Changes on Travel Behavior**

Michael G. McNally, Civil and Environmental Engineering, UC Irvine

### **The Impact of Attitudes toward Mobility, Adoption of Previous Strategies, and Demographic Characteristics on Responses to Congestion**

Patricia L. Mokhtarian, Civil and Environmental Engineering, UC Davis

### **Measuring the Role of Transportation in Facilitating the Welfare-to-Work Transition (Third Year)**

Paul Ong, Urban Planning, UCLA

### **Systematic Transport Access and Policies for Low Wage Labor Markets**

John M. Quigley, Public Policy, UC Berkeley

### **Activity-Based Forecasting Model for Planning Applications**

Will Recker, Institute of Transportation Studies, UC Irvine

### **Inventory Theoretic Models of Freight Demand: Revisiting the Past in Light of the New Economy**

Amelia Regan, Civil Engineering, and Charles Lave and Amihai Glazer, Economics, UC Irvine

### **The Environment - Transit Crime Connection: Continuing Study of the Metro Green Line and its Vicinity**

Anastasia Loukaitou-Sideris, Urban Planning, UCLA

### **Has Parking Cashout Failed in California?**

Don Shoup, Public Policy and Social Research, UCLA

### **Reconsidering the Effects of Fare Reductions on Transit Ridership**

Brian D. Taylor, Urban Planning, UCLA

### **Planes, Trains, or Camionetas (little buses)? A Baseline Study of an Informal Travel Mode**

Abel Valenzuela Jr., Public Policy and Social Research, UCLA

### **Understanding and Modeling Driver Behavior in Dense Traffic Flow**

H. Michael Zhang, Civil and Environmental Engineering, UC Davis

### **3 - YEAR 14 (2001- 2002) RESEARCH PROJECTS (15 PROJECTS)**

#### **How Does Travel Behavior Change When Households Change Jobs?**

William Clark, UCLA

#### **Design of Vehicle Routes and Driver Shifts for Systems with Uncertain Demand**

Carlos Daganzo, UC Berkeley

#### **Effect of Driving Mode on Light-Duty Vehicle Emissions Measured On-Road**

Robert Harley, UC Berkeley

#### **Using the Spatial Configuration of Cities to Estimate The Impact of Commuting Time on Hours of Work**

Antonio Bento, UC Santa Barbara

#### **Evaluation of the California Safe Routes to School Program**

Marlon Boarnet and Kristen Day, UC Irvine

#### **Forecasting Demand and Values of Travel Time Savings for Freeway HOV, Toll and HOT Facilities: Incorporating Attitudes and Perceptions into Commuter Choice Models**

David Brownstone and Thomas Golob, UC Irvine

#### **Transit-Based Housing: Residential Sorting and Its Influence on Mode Choice**

Robert Cervero, UC Berkeley

#### **Real-time Travel Data Collection System Augmented with Speech Interface**

Reginald Golledge, UC Santa Barbara

#### **Life -Cycle Environmental and Economic Assessment of Using Recycled Materials for Asphalt Pavements**

Arpad Horvath, UC Berkeley

#### **Reinforcement Learning in Transportation Infrastructure Management**

Samer Madanat, UC Berkeley

#### **Dissonance between Desired and Current Residential Neighborhood Type: Relationships to Travel-Related Attitudes and Behavior**

Patricia Mokhtarian and Ilan Salomon, UC Davis

#### **Optimal Control Policies for Urban Corridor Management**

Wilfred Recker, UC Irvine

#### **The Impact of Motor Vehicle Transportation on Water Quality**

Jean Daniel Saphores, UC Irvine

#### **Putting Back the Pleasure in the Drive: Reclaiming Urban Parkways for the 21<sup>st</sup> Century**

Anastasia Loukaitou-Sideris, UCLA

#### **Equity and Environmental Justice in Transportation**

Martin Wachs, UC Berkeley

#### **4 - YEAR 15 (2002-2003) RESEARCH PROJECTS (17 PROJECTS)**

##### **Expanded Evaluation of the California Safe Routes to School Program**

Marlon Boarnet, Kristen Day, and Kenneth Anderson, UC Irvine

##### **Verifying Regularities in Queued Freeway Traffic**

Michael Cassidy, UC Berkeley

##### **Neighborhood Design, Physical Activity, and Travel**

Robert Cervero, UC Berkeley

##### **Comparing White and Minority Household Commuter Behavior**

William Clark, UCLA

##### **Storage System Dynamics and Management Policies**

Carlos Daganzo, UC Berkeley

##### **Judging the Speed of Pedestrians and Bicycles at Night**

Karen DeValois, UC Berkeley

##### **Safer and More Efficient Truck Operations on Urban Freeways**

Thomas Golob and Amelia Regan, UC Irvine

##### **High-Coverage Point-to-Point Transit**

R. Jayakrishnan and T. Golob, UC Irvine

##### **Incorporating Seismic Risk Considerations in Transportation Infrastructure Management**

Samer Madanat, UC Berkeley

##### **Handheld Travel Survey Technology to Supplement Vehicle Tracking**

Michael McNally, UC Irvine

##### **I/O Analysis of Communications and Travel for Industry**

Patricia Mokhtarian, UC Davis

##### **Car Ownership, Insurance Premiums and Employment Outcomes**

Paul Ong, UCLA

##### **Public Transit and Residential Location Choices of Minorities and Transit Dependents**

John Quigley and Steven Raphael, UC Berkeley

##### **An Evaluation of Employer-Based Transit Programs**

Donald Shoup, UCLA

##### **Effects of Contracting on Fixed-Route Bus Cost-Efficiency**

Brian Taylor, UCLA and Martin Wachs, UC Berkeley

##### **Exploring the Marketability of Fuel-Cell Electric Vehicles**

Thomas Turrentine and Kenneth Kurani, UC Davis

##### **Experimental and Theoretical Investigations of Traffic Flow at Highway Merges**

Michael Zhang, UC Davis

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**5- YEAR 16 (2003-2004) RESEARCH PROJECTS (COMPLETED PROJECTS ONLY: 5 of 10)**

**Experiments to Increase Freeway Merge Capacity**

Michael Cassidy, Civil and Environmental Engineering , UC Berkeley

**Death on the Crosswalk: A Study of Pedestrian Accidents in Los Angeles:**

Anastasia Loukaitou-Sideris, Urban Planning, UCLA

**Aggregate Structural Equations Modeling of the Relationships Between Consumer Expenditures on Communications and on Travel**

Patricia Mokhtarian, ITS, UC Davis

**Capacity Provision and Pricing in Road Transport Networks in an Imperfectly Competitive Economy**

Kurt Van Dender, ITS, UC Irvine

**Family Caregivers, the Elderly, and Land-Use: An Evaluation of Transportation in Two California Communities**

Martin Wachs and Annie Decker, ITS, UC Berkeley

**6 - YEAR 17 (2004-2005) RESEARCH PROJECTS (COMPLETED PROJECTS ONLY: 1 of 17)**

**Similarity Analysis for Estimation of an Activity-based Travel Demand Model**

Wilfred Recker, UC Irvine