



Year 13 (2000-2001)
Annual Report
For the
University of California Transportation Center

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University Transportation Centers Program
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OVERVIEW: CENTER THEME AND ACTIVITIES

2001-2 has been the University of California Transportation Center's 13th year as the Region IX University Transportation Center. Headquartered at UC's Berkeley campus, the UCTC supports transportation research, education, and technology transfer designed to advance the state of the art and the state of the practice of transportation. Researchers from any of the nine UC campuses are eligible to participate in UCTC, and researchers from other campuses may join us as research team members.

During 2001-2, the California Department of Transportation (Caltrans) matched US Department of Transportation (US DOT) funds dollar-for-dollar. Caltrans has provided this match every year since our inauguration. Unfortunately, cutbacks in USDOT funding for regional transportation centers meant that we were unable to claim funds that Caltrans otherwise would have provided. This double-whammy of cutbacks in turn required us to scale back our activities from what we originally proposed in our strategic plan, budgeted assuming the full million dollar grant would be available from each sponsor. Nevertheless, we found ways to make do with less and proceeded to launch new research, support educational efforts, and carry out a variety of technology transfer activities. Our two sponsors made all of these activities possible.

The UCTC experienced several changes during our 13th year. In July 2000, our longtime administrator, Briggs Nisbet, "retired" from UC to devote more time to her writing and editing. That fall, support staff member Chow Saepanh also departed. We spent several months understaffed while we wended our way through the university hiring processes. Finally, in October we welcomed Diane Sutch, who joined us as our new administrator. Diane formerly worked as the Berkeley campus ridesharing coordinator, so came to UCTC already familiar with much of our work. Given our tight budget, we concluded that we could no longer afford a second administrative staff member and decided instead to "borrow" staff from other campus units and utilize the services of part-time student assistants. Graduate student Eric Nakajima joined us in January to help on a part time basis with publications and outreach.

The UCTC also changed its grant start date to August 1 beginning in Year 13. Previously our grant start date had been October 1. The new, earlier start date fits better with the start of classes and student hiring periods, especially at the Berkeley campus where the fall term begins in August. The conversion to new accounting systems on three of our campuses slowed the awards process somewhat, but we are confident that the new schedule will work better for us in the future.

UCTC research focuses on the theme, "Transportation Systems Analysis and Policy." The development of new methods and approaches for transportation forecasting and analysis, explorations of alternative policy approaches, and evaluations of existing policies and programs are examples of the kinds of projects that are eligible for UCTC support. As long as policy relevance is demonstrated, research may be in any discipline, including (but not limited to) planning, engineering, economics, political science, policy studies, management, public health, environmental studies, history, psychology, and the natural sciences. We especially welcome interdisciplinary and multi-disciplinary work. We emphasize surface transportation modes (highways, rail, etc.) rather than air or maritime transportation, but we support intermodal research involving the air and water modes if it has significant surface transportation components. Both passenger transport and freight transport topics are considered.

All UCTC research grants are awarded through a process that relies on outside peer review. The process is highly competitive, as available funds are sufficient to cover less than half of the amounts requested. In Year 13 we experimented with a new approach for handling the difficult process of project selection.

Following a double-blind review of all projects by outside experts, an advisory panel, this year consisting of Dr. Sandra Rosenbloom of the University of Arizona, Dr. Edward Beimborn of the University of Wisconsin, and Dr. Randolph Hall of the University of Southern California, considered all the reviews and advised the UCTC on the projects that appeared to be most worthy of funding. The assistance of this review panel greatly aided the UCTC Executive Committee in choosing which proposals to award funding.

UCTC not only carries out research but also contributes to transportation education. The UCTC's educational objective is to help produce a vibrant network of transportation professionals who will put their education and research findings into practice. The UCTC does not directly offer courses, enroll students, or offer degrees - within the UC system, those functions are reserved for academic departments. The UCTC does, however, support transportation education through fellowship programs, course support, and a competitive PhD dissertation grant program. Fellowship and course support grants are focused on the four campuses that have formal transportation programs - Berkeley, Davis, Irvine, and UCLA. However, students from any of the nine UC campuses may apply for a dissertation grant. In 2000-2001 we spent over half of our total budget on these educational items. Student work on research projects is also educational, of course, and students receive about two-thirds of our research budget.

The UCTC's technology transfer programs are aimed at communicating research results to a broad audience. Our web page provides information on our programs, summaries of our research, and electronic access to an increasing number of our publications. Free copies of all research papers funded by UCTC are provided to those who request them. We distribute 15,000 hard copies of our transportation magazine, ACCESS, which we publish twice a year. Many others read ACCESS on the web. Our strong publications program is possible because of the talents of our two editors. Editor in Chief Melvin Webber, who is Professor Emeritus of City and Regional Planning, has a talent for identifying topics that are timely and apt. Both he and our Managing Editor, Melanie Curry, work closely with researchers to produce informative, readable articles, even on topics that are highly technical and specialized.

In Year 13, the UC Transportation Center received \$862,300 from the US DOT and a matching \$862,300 from Caltrans, for a budget of \$1,724,600. This support enabled us to fund about \$620,000 in faculty research research, \$460,000 in fellowships, and \$35,000 in teaching. Most of our administrative budget is allocated to publications, conferences and symposia; we kept our purely administrative costs to about 10 percent of the total funds available.

The substantial support we receive from the University of California and our faculty has made it possible to continue a strong UCTC program in the face of funding reductions. Substantial permanent financial support comes from the University for transportation research and education programs. The US DOT requires a \$200,000 commitment in regularly budgeted institutional funds for a university to be eligible for Center designation; even a fraction of the salaries and benefits for the full-time faculty members who conduct transportation research at Berkeley, Davis, Irvine and UCLA sums to an amount far in excess of the \$200,000 required. In addition, several permanently (separately) funded research institutes and academic departments administer individual UCTC research grants and fellowships. The Institutes of Transportation Studies at Berkeley, Davis, Irvine and UCLA and the Institute of Urban and Regional Development at Berkeley provide major assistance each year.

UCTC faculty and students also benefit from their access to University computer, data, and library resources. Of particular note is the Library of the Institute of Transportation Studies, which was established in 1948 and is supported with Caltrans funds allocated through a direct line item in the state budget. The resources of the library are available to faculty and students on all campuses. This year, we

instituted an annual visit to each of the four main UCTC campuses by Librarian John Gallwey, as a way of introducing new students to library holdings and services.

We look back over our thirteen years as the Region IX university transportation center with a sense of accomplishment. UCTC has made significant progress in research, education, and technology transfer. We have been able to expand and enrich our education programs, which in turn have attracted an increased number of faculty, students, and staff into transportation, including individuals from a variety of economic, social, and ethnic backgrounds. Our graduates are well-trained academics and professionals known for their skills, creativity, and motivation, and many of them are now in positions of leadership and responsibility in the transportation profession. Our research and professional activities are reflected in new approaches to a variety of transportation concerns, from ways to extend the life of asphalt pavements, to the use of improved methods for transportation and activity analysis and forecasting, to the development of new federal, state, and local programs to support transit-oriented development, implement traffic calming, and more effectively reduce vehicle emissions.

While we are proud of our accomplishments, we continue to believe that there is much more to be done on the list of priorities we developed several years ago:

- managing our extensive transportation systems more efficiently
- improving connections among the modes of transportation
- providing high quality transport services to meet diverse and changing needs in both the passenger and freight sectors
- adjusting programs to respond to growth and to changes in activity patterns
- introducing and accommodating new technologies
- more effectively assessing and communicating the social, economic, and environmental consequences of transportation programs and projects
- improving the equity of transportation programs and projects
- moving toward sustainable transportation and land use patterns
- designing better processes for the involvement of diverse public and private interests in transportation planning, decision making and deployment
- developing efficient mechanisms for transportation finance.

We believe these challenges confronting the transportation sector must continue to be addressed through innovative and rigorous educational programs, creative systems analysis and policy research, and active technology transfer. Thus, we are committed to continue to our work over the years to come, serving Region 9 and the nation as a center of excellence.

--- Elizabeth Deakin
October 2001

MANAGEMENT STRUCTURE AND CENTER STAFF

The University of California Transportation Center is headquartered on the Berkeley campus of the UC system. Center personnel include a half-time director who also is a faculty member, plus a small administrative and editorial staff. Direction for the UCTC comes from a faculty Executive Committee drawn from several campuses of the UC system. Coordination with other California Transportation Centers and with our Caltrans sponsor takes place through meetings held three times a year (once at each of the three California UTCs.) The UCTC also draws upon a variety of institutional resources at participating campuses, including the administrative services of researchers' academic departments and research institutes, whose support is donated.

Center Director

Professor Elizabeth Deakin of the Dept. of City and Regional Planning at UC Berkeley is the UCTC Director, a position she has held since March 1999. Prof. Deakin has been a member of the faculty at the University since 1985 and has had additional affiliations with the Civil Engineering, Urban Design, and Energy Resources groups for much of that time. Her interests include transportation and land use, transportation policy, and the social, economic, and environmental impacts of transportation. She has conducted research with ITS, PATH, and IURD as well as with the UC Energy Institute and the UC Policy Center. She has served on the UCTC Executive Committee since its inception and previously was a member of the ITS and IURD executive committees. She was acting director of the IURD in 1997-98. In addition to teaching at Berkeley, she taught for a year at UCLA and has lectured at Davis. Her familiarity with the University and the UCTC's partners facilitates her management of the UCTC.

Executive Committee

The UCTC Executive Committee is a faculty committee that sets the overall policy direction for the Center and assures coordination with the major transportation research and education groups on the various campuses. Members of the UCTC Executive Committee volunteer significant amounts of time to the Center. They meet in person at least once a year, and transact business in the interim through telephone conference calls and e-mail.

The Executive Committee consists of the UCTC Director, the directors of the four Institutes of Transportation Studies or their representatives, the director of the Institute of Urban and Regional Development or her representative, and faculty representatives of the major transportation degree-granting programs in the UC system. This representative membership facilitates information exchange about education programs, recruiting, and other academic matters and aids in the coordination of research among the campuses and research units. Members of the Executive Committee for 2000-2001 were:

Marlon Boarnet, Assoc. Prof. of Urban & Regional Planning, UC Irvine
Robert Cervero, Prof. of City & Regional Planning, UC Berkeley
Elizabeth Deakin, UCTC Director, Assoc. Prof. of City & Regional Planning, UC Berkeley
Robert Johnston, Prof. of Environmental Science & Policy, UC Davis
Samer Madanat, Prof. of Civil & Environmental Engineering, UC Berkeley
Michael McNally, Assoc. Prof. of Civil and Environmental Engineering, UC Irvine
Patricia Mokhtarian, Prof. of Civil and Environmental Engineering, UC Davis
Debbie Niemeier, Assoc. Prof. of Civil and Environmental Engineering, UC Davis
Will Recker, Director, Institute of Transportation Studies, UC Irvine

Amelia Regan, Asst. Prof. of Civil & Environmental Engineering, UC Irvine
Donald Shoup, Director, ITS UC Los Angeles
Daniel Sperling, Director, ITS Davis
Brian Taylor, Asst. Prof. of Urban Planning, UC Los Angeles
Martin Wachs, Director, Institute of Transportation Studies, Berkeley

The Executive Committee is responsible for establishing the theme for the Center and reviewing it from time to time, allocating funds among research, education, and technology transfer programs, determining subject matter priorities for research funding, setting rules for allowable expenditures on research projects, and making final recommendations on research awards. In addition, the Executive Committee conducts an annual review of the Center's overall performance and resources, and redirects funds allocations and activities as necessary. When the Directorship of the UCTC becomes vacant, the Executive Committee conducts the search and recommends a Director to the Office of the President of the University, which so far has always acted favorably on the Executive Committee's recommendations.

The Executive Committee's time is donated.

Center Faculty

Faculty affiliates of the UCTC include individuals throughout the UC system. Our affiliates have participated in the research, teaching, and continuing education programs funded by the UCTC over the past 13 years. We maintain contact with our faculty affiliates by inviting them to participate in our research, education, and technology transfer programs, by coordinating UCTC research with other research activities these faculty members are conducting, and by providing them with publications and other information services. Table 1 lists current faculty affiliates. The list is updated annually and is posted on the UCTC website, www.uctc.net.

Staff

The UCTC staff currently consists of the director (half time) plus one full time administrative staff member, a graduate assistant, and a half time staff editor, plus an emeritus faculty member who is paid a nominal sum for his time as editor of ACCESS. 2000-2001 staff members were:

Elizabeth Deakin, Associate Professor of City and Regional Planning, Director (half time)

Diane Sutch, Administrator. Ms. Sutch handles budgets and administration for the Center.

Melanie Curry, Editor (half time). Ms. Curry is responsible for ACCESS, UCTC's twice-yearly magazine.

Melvin Webber, Professor Emeritus of City and Regional Planning, UC Berkeley and former Director of UCTC. Prof. Webber was the creator of ACCESS magazine and serves as its editor in chief.

Eric Nakajima, Graduate Assistant (25-50% time). Mr. Nakajima, a masters student, joined UCTC in winter 2001 and serves as a part-time staff assistant.

In addition, **Chow Saephanh** served as Administrative Assistant for UCTC during the first part of the fall semester, 2000. Ms. Saephanh handled bookkeeping and billings at the UCTC. Following her departure, these services were contracted on a part time basis through other UC administrative units.

Institutional Support

The UCTC depends upon the support of several academic departments and research institutes for most of its day-to-day operations. The departments and research institutes manage education grants, fellowship funds and research grants, and contribute the office and laboratory space, instructional facilities, computational equipment, accounting services and other administrative support needed to carry out these programs and activities. Most of this support is provided without charge. In addition, the University provides administrative services, but does not charge overhead on the portion of funds used for fellowships, and to date has waived overhead on matching funds from Caltrans. It is only because the UCTC can rely on these university resources that we are able to devote most of our funding to the direct costs of research, education, and technology transfer.

The University also provides resources in the form of access to data centers, computer facilities, and libraries. The University is a federal data repository and has developed extensive capabilities to support the efficient retrieval and analysis of information from a variety of sources. Our computer facilities include advanced CAD and GIS systems. A major resource is the University of California library system. We are especially proud of the Harmer E. Davis Library of the Institute of Transportation Studies at Berkeley, which houses one of the largest collections of transportation materials in the world and provides a wide range of support services to UCTC faculty and student researchers on all campuses. ITS also provides publicity for UCTC events.

Faculty members' time commitments to research projects are another highly valuable resource provided to the UCTC. Faculty members typically hold nine-month (academic year) appointments that are fully funded by the University. They are expected to spend a substantial portion of this University time on research. Consequently, UCTC faculty grant recipients typically devote a third or more of their time during the academic year to their research projects. The UCTC itself funds only a portion of their summer salaries. The UC-funded time on research multiplies the UCTC's salary support for research by a factor of three or four. Likewise, students with fellowships from the University, from NSF, and from a variety of other sources often participate in UCTC projects without being paid with UCTC funds.

Participation in the governance of the UCTC is a second way that faculty time is donated. Indeed, the willingness of faculty members and others to provide these services is critical to the Center's mode of operation. Faculty members serve on the Executive Committee, on committees that review fellowship applications and dissertation grant proposals, and on ad hoc committees formed to develop conferences, workshops, and other outreach activities.

California Transportation Centers

Two other University Transportation Centers have been established in California, the Norman Y. Mineta International Institute for Transportation Policy Studies (the Mineta Center) at California State University, San Jose, and METRANS - the Center for Metropolitan Transportation Studies at the University of Southern California in Los Angeles. These two centers, like UCTC, receive matching support from Caltrans. To coordinate our efforts, the Center Directors and key administrators meet together with Caltrans staff three times a year, rotating among campuses.

Table 1. UCTC Faculty Associates

Professor	Department	Campus	Email
Matthew Barth	Civil Engineering	Riverside	barth@cert.ucr.edu
Antonio Bento	Economics / Environment	Santa Barbara	bento@bren.ucsb.edu
Evelyn Blumenberg	Urban Planning	Los Angeles	eblumenb@ucla.edu
Marlon Boarnet	Urban & Regional Planning	Irvine	mgboarne@uci.edu
Peter Bosselmann	City & Regional Planning	Berkeley	pbossel@uclink.berkeley.edu
David Brownstone	Economics	Irvine	dbrownst@uci.edu
Michael Cassidy	Civil Engineering	Berkeley	cassidy@ce.berkeley.edu
Robert Cervero	City & Regional Planning	Berkeley	robertc@uclink4.berkeley.edu
William Clark	Geography	Los Angeles	wclark@geog.ucla.edu
Theodore E. Cohn	Vision Science	Berkeley	tecohn@spectacle.berkeley.edu
Randall Crane	Urban Planning	UCLA	crane@ucla.edu
Carlos Daganzo	Civil Engineering	Berkeley	daganzo@ce.berkeley.edu
Elizabeth Deakin	City & Regional Planning	Berkeley	edeakin@uclink.berkeley.edu
Joseph Dimento	Social Ecology	Irvine	jfdiment@uci.edu
G.J. "Pete" Fielding	Social Science	Irvine	gjfieldi@uci.edu
William Garrison	Civil Engineering	Berkeley	garrison@ce.berkeley.edu
David Gillen	Economics/Civil Engineering	Berkeley	dgillen@ce.berkeley.edu
Amihai Glazer	Economics	Irvine	aglazer@uci.edu
Reginald Golledge	Geography	Santa Barbara	golledge@geog.ucsb.edu
Judith Gruber	Political Science	Berkeley	jgruber@socrates.berkeley.edu
Mark Hansen	Civil Engineering	Berkeley	hansen@ce.berkeley.edu
Robert A. Harley	Civil Engineering	Berkeley	harley@ce.berkeley.edu
Karl Hedrick	Mechanical Engineering	Berkeley	khedrick@ce.berkeley.edu
Judith Innes	City & Regional Planning	Berkeley	jinnes@uclink.berkeley.edu
Allan B. Jacobs	City & Regional Planning	Berkeley	ajacobs@uclink.berkeley.edu
R. Jayakrishnan	Civil Engineering	Irvine	rjayakri@uci.edu
Robert Johnston	Environmental Studies	Davis	rajohnston@ucdavis.edu
Adib Kanafani	Civil Engineering	Berkeley	kanafani@ce.berkeley.edu
Theodore Keeler	Economics	Berkeley	keeler@econ.berkeley.edu
John Landis	City Planning	Berkeley	jlandis@uclink.berkeley.edu
Charles Lave	Economics	Irvine	calave@uci.edu
Ana. Loukaitou-Sideris	Urban Planning	Los Angeles	sideris@ucla.edu
Samer Madanat	Civil Engineering	Berkeley	madanat@ce.berkeley.edu
Michael McNally	Civil Engineering	Irvine	mmcnally@uci.edu
Patricia Mokhtarian	Civil Engineering	Davis	plmokhtarian@ucdavis.edu

Table 2 cont.

Professor	Department	Campus	Email
Carl Monismith	Civil Engineering	Berkeley	monismith@ce.berkeley.edu
Debbie Niemeier	Civil Engineering	Davis	dniemeier@ucdavis.edu
Raymond Novaco	Social Ecology	Irvine	rwnovaco@uci.edu
Paul Ong	Urban Planning	Los Angeles	pmong@ucla.edu
John Quigley	Public Policy	Berkeley	quigley@econ.berkeley.edu
Wilfred Recker	Civil Engineering	Irvine	wwrecker@uci.edu
Amelia C. Regan	Civil Engineering	Irvine	aregan@uci.edu
Stephen Ritchie	Civil Engineering	Irvine	sritchie@uci.edu
David Roche	Management	Davis	dmrocke@ucdavis.edu
Paul Sabatier	Environmental Studies	Davis	pasabatier@ucdavis.edu
Allen Scott	Regional Policy	Los Angeles	ajscott@geog.ucla.edu
Donald Shoup	Urban Planning	Los Angeles	shoup@ucla.edu
Kenneth Small	Economics	Irvine	ksmall@uci.edu
Daniel Sperling	Civil Engineering	Davis	dsperling@ucdavis.edu
Michael Southworth	City & Regional Planning	Berkeley	msouthw@uclink.berkeley.edu
Brian Taylor	Urban Planning	Los Angeles	btaylor@ucla.edu
Abel Valenzuela, Jr.	Public Policy	Los Angeles	abel@ucla.edu
Martin Wachs	ITS / Civil Engineering	Berkeley	mwachs@uclink4.berkeley.edu
Melvin Webber	City & Regional Planning	Berkeley	webber@uclink.berkeley.edu
H. Michael Zhang	Civil Engineering	Davis	hmzhang@ucdavis.edu

ACCOMPLISHMENTS: EDUCATION, RESEARCH, TECH TRANSFER

Education Programs

As we noted earlier, the UCTC does not itself offer courses, admit students, hire faculty, or award degrees; those functions are the responsibility of the various academic departments and the academic units of the University administration. We rely on the departments and academic units to maintain and expand their course offerings and enrollments, and the departments have explicit incentives to do so.

The UCTC does, however, provide financial and other support to the academic programs in transportation. In this way, the UCTC is helping to produce many of the transportation leaders of the future. In 2000-2001, UCTC helped departments to maintain and expand their course offerings, supporting new courses that address emerging technologies and their policy implications, and strengthening our studio and fieldwork offerings.

Courses specifically focusing on various aspects of transportation are available for both undergraduates and graduates. Many of these courses are offered through the formal programs and concentrations in transportation offered by the Berkeley, Davis, Irvine, and UCLA campuses' civil engineering, city and regional planning, economics, and public policy departments. Additional courses with significant transportation content are offered in other departments at these universities and at other campuses of the UC system, including Riverside, Santa Barbara, and San Diego. Energy resources, environmental studies, management, geography, political science, law, mechanical engineering, electrical engineering, chemical engineering, operations research, architecture, landscape architecture, and urban design now include transportation topics in one or more courses, reflecting the increased faculty interest in transportation largely generated by the UCTC.

Ten formal degree programs or concentrations in transportation are now offered in the UC system, with three each at Berkeley, Davis and Irvine, and one at UCLA. The civil and environmental engineering departments at Berkeley, Davis, and Irvine offer transportation engineering degrees. Programs in transportation planning and policy are offered at Berkeley, Davis, Irvine, and UCLA, and a concurrent degree program in transportation engineering and planning is also offered at Berkeley. At Irvine, the Department of Economics administers an interdisciplinary doctoral program in transportation science. Davis has recently established an interdisciplinary program in Transportation Technology and Policy.

The several campuses have slightly different program emphases and they try to complement rather than duplicate one another. The Davis transportation engineering program provides a focus on energy and air quality, and Irvine and Davis both emphasize demand analysis and travel behavior. The Berkeley transportation program has strong offerings in traffic operations, logistics, systems analysis, transportation science, and the analysis and improvement of pavements. Irvine has an especially strong program in transportation economics, while UCLA is developing a specialty in equity and the transportation needs of low-income communities; Berkeley has extensive offerings in transportation, land use, and urban design.

Each of the campuses continued to maintain and refine their transportation programs, and to add new course offerings and programmatic specialties as opportunities arise. For example, Berkeley added a new course in Intelligent Transportation Systems to disseminate the knowledge that has been developed in its pioneering Program for Advanced Transit and Highways (PATH), and focused an undergraduate urban planning studio on transportation planning applications. The UCTC assisted these efforts.

Undergraduate Education Programs

UCTC funding for undergraduate education at the various campuses has been focused on the development of new transportation courses. Proposals are submitted to the Director, who evaluates them and decides on funding. The proposals may be for specialty courses addressing an important current topic and designed to be offered once or twice, or for more basic courses designed to become a part of the permanent offerings of the university after a year or two of UCTC support.

Undergraduate courses thus offered with UCTC sponsorship have been well subscribed and well received, and they have helped to spark interest in careers in transportation. We therefore will continue supporting undergraduate course initiatives. We also will work with the various departments offering transportation courses for undergraduates to help advertise and promote these courses and to coordinate course offerings with transportation research opportunities for undergraduates.

More extensive undergraduate programs proposed in our strategic plan have had to be postponed because of federal cutbacks in funding, which also reduced Caltrans funding since the Caltrans money matches federal funds dollar for dollar.

UCTC Graduate Education Programs

The UCTC assists graduate programs in transportation both through course support and through the provision of fellowships and research opportunities for graduate students. As with undergraduate courses, graduate course support is in response to applications that are reviewed and approved by the Director, and may be for specialty courses or for the development of a new course intended to become part of the curriculum.

Education Highlights: New Academic Courses

Several new courses were initiated at the various campuses during UCTC Year 13.

CE 253 Intelligent Transportation Systems (Fall 2000) Profs. Alex Skabardonis and Mark Hansen initiated a course on intelligent transportation systems at UC Berkeley. The course examined use of advanced surveillance, navigation, communication, and computer technology to monitor, analyze, and improve the performance of transportation systems. Students learned about applications to monitoring, analysis, evaluation, and prediction of transportation system performance and behavior. They also studied intervention strategies, and considered human factors and institutional issues.

CE 291A Planning for Traffic Safety and Injury Control (Spring 2001). Prof. David Ragland of the UC Berkeley Dept. of Public Health and CEE Lecturer Paul Ossenbrugen taught a course on planning for traffic safety and injury control. Topics included: pre-crash, crash, and post-crash models; roles of vehicle, roadway, traffic, driver, and environment; crash and injury causations; vehicle and occupant dynamics; accident investigation; crash and injury control measures; costs of injury and countermeasures; policy issues; and safety and injury control programs. The course was also listed as Public Health C285. While UCTC did not fund this course, we did help to publicize it to the students across campus.

CP 218 Transportation Studio (Fall 2000). Prof. Elizabeth Deakin taught a studio at UC Berkeley designed to give students direct experience with local transportation issues. The studio focused on

parking and access problems in the popular 4th Street shopping district of Berkeley, CA. Class members presented their findings to representatives of the city, property owners and merchants. Class members were also invited to present their findings at a meeting of the Berkeley City Council in February 2001.

CP 259 Advanced Land Use Seminar: Technology and the City (Fall 2000). Prof. Elizabeth Deakin and PhD student Jonathan Mason taught a seminar on how technology has shaped, and is re-shaping, the city. Transportation and telecommunications technologies were featured in the readings and discussions.

CP 290 Traffic Calming, Pedestrian and Bicycle Planning (Spring 2001). PhD candidate Asha Weinstein and Prof. Elizabeth Deakin taught a seminar on traffic calming and bike and pedestrian planning for graduate students in UC Berkeley's City and Regional Planning and Transportation Engineering programs. Deakin contributed her time for this course.

Davis Seminar Series. UC Davis offered a graduate seminar on topics in transportation and energy and environment and on travel behavior and activity systems. Guest lecturers presented recent work before an audience that combined graduate students enrolled in the talks with participants from state, regional and local agencies.

Davis Short Courses. In 2000-2001, UCTC provided funding for a series of short courses on air pollution and new technologies at UC Davis. These courses offer specialty training to graduate students.

Continuing Education

Transportation courses and other education and training opportunities are offered through the ITS Extension (which operates statewide) and the Extension programs of the various campuses. These courses reach transportation professionals and others who need a better understanding of transportation to effectively carry out their work in fields such as air quality planning and land use planning. UCTC research is frequently included in short courses offered by the University Extension. The UCTC actively encourages researchers to participate in these activities and provides support for them to do so, to the extent that resources permit. In 2000-2001, several UCTC faculty affiliates, including Professors Martin Wachs, Brian Taylor, Elizabeth Deakin, and Randall Crane, participated in conferences on California's transportation future in cooperation with the UCLA Public Policy Extension and Caltrans. UCTC research was prominently featured at these conferences.

Fellowships

Graduate students in the Berkeley, Davis, Irvine and UCLA transportation programs are eligible for UCTC fellowships, which provide support for university fees and living expenses and may be combined with part-time research appointments. UCTC fellowship recipients must be pursuing careers in transportation. Academic departments nominate the students on the basis of grades, test scores, letters of recommendation, and record of accomplishments. Students must demonstrate that they have an exceptional record and outstanding potential to receive a UCTC fellowship. Overall fellowship funding is coordinated through the departments in accordance with University and departmental rules to assure an equitable distribution of financial support for top students, so that a student who is offered a transportation fellowship from another program is generally not awarded full UCTC funding.

In 1999-2000, the UCTC committed \$460,000 to graduate student fellowships at the Berkeley, Davis, Irvine, and UCLA campuses.

Graduate Student Research Appointments

Graduate student research appointments and fellowships have always been the UCTC's biggest budget items, accounting for about two-thirds of our total budget. Cutbacks in federal funding, which also reduced Caltrans funding dollar for dollar, necessitated the imposition of a general limitation on research project support for graduate student researchers (GSRs) to one half-time position per research project. Because some projects were carried over from the previous year and some students worked less than half time, we were able to support 40 students as GSRs in 2000-2001.

GSRs are considered to be junior colleagues of the principal investigator and other faculty participants and often play a major role in the actual conduct of the research. It is the policy of the UCTC that graduate student contributions to research projects are acknowledged in any publication resulting from research funded by the Center. The acknowledgment can range from a footnote recognizing the student's participation and assistance to full co-authorship of reports and articles, depending upon the nature and extent of student contributions.

Doctoral Dissertation Grants

The UCTC offers up to ten doctoral dissertation grants of \$15,000 each year. Applicants must be students at the University of California and must be carrying out dissertation research on transportation topics consonant with UCTC's theme of systems analysis and policy. Applicants must have advanced to candidacy for the Ph.D. degree prior to the application deadline and must submit a synopsis of their dissertation proposal for review. The synopsis can be no longer than five pages in length and must present the research problem, discuss its significance, and describe the research methodology, data sources, and expected results. The student's curriculum vita and graduate school transcripts must be forwarded with the application, along with a letter of nomination from the student's principal academic advisor.

The pool of applications is reviewed by a faculty committee from several UC campuses, appointed by the UCTC Director. Grants are awarded on the basis of reviewers' assessments of the originality and significance of the research topic, the applicant's overall record of academic and professional accomplishment, and the relevance of the research topic to current issues in transportation policy. Applications for the grants are due April 1 for funding the next fall, and November 1 for funding in the winter/spring term. The RFP for dissertation grants is maintained on the UCTC website, and notices of impending due dates are sent to faculty associates for distribution.

The dissertation grants awarded for 2000-2001 are listed in the section, Research Project Status.

Student of the Year

Each year UCTC Executive Committee members choose a Student of the Year, who is awarded \$1000 and the costs to attend the award ceremony held during the annual meeting of the Transportation Research Board (TRB) in Washington, DC each January. This year Karen Smilowitz of the UC Berkeley Dept. of Civil and Environmental Engineering was selected for the award. Her faculty adviser was Prof. Carlos Daganzo. Ms. Smilowitz received her Ph.D. in May and accepted a professorship at Northwestern University.

Tracking Alumni

During the 2000-2001 academic year, in consultation with administrators at the degree-offering departments at the four campuses, we continued to develop a system for tracking students supported by the UCTC in programs on the four campuses that grant transportation degrees. In cooperation with the UC Office of the President, Lyn Long of the UC Irvine campus has designed an alumni database and website, for use on all UC campuses. We expect that this database will be operational in fall 2001.

Research Programs

Research grants to faculty and PhD candidates account for about 45 percent of the UCTC's budget. Hence, a substantial portion of our efforts is devoted to the solicitation of research proposals, proposal review, selection of projects, and performance monitoring. In 2000-2001, we maintained a high level of interest in our program, as indicated by the 27 faculty proposals and 20 PhD dissertation grant applications received.

The research funded by the UCTC must respond to the Center's theme, transportation systems analysis and policy. The UCTC Director and Executive Committee annually review our research selection procedures to evaluate their objectivity and fairness, and make adjustments as appropriate. We also meet to discuss our theme and the scope and mix of the projects we are funding, and from time to time issue special calls for research on particular topics to improve the overall balance and policy relevance of the UCTC research program.

The UCTC's success in research relies upon a carefully managed solicitation and project selection process, designed to support creative and innovative work on a variety of topics relevant to current and emerging policy needs, and to communicate our results to a broad audience. The process for dissertation research grants was described under the educational programs. For faculty research, the general procedure for project awards is as follows.

Research Solicitation Process

UCTC makes research project awards either to individuals or to teams of researchers. The Principal Investigator must be a faculty member within the UC System; researchers from universities outside the University of California may be included through a subcontract with the PI's campus.

The UCTC request for proposals (RFP) is maintained on our website. About two months before proposals are due, we send an email notification to faculty members on our associates list as well as to deans, department heads, and research directors for circulation to their faculty. The deadline for faculty proposals is Feb. 1 of each year.

Each proposal must be prepared in two parts. Part A is a description of the proposed research. Part B includes the vita of the principal investigator, a summary of accomplishments from the applicant's past UCTC research grants (if any), including a list of working papers and other publications produced, and a statement identifying any research funding from other organizations for work on the topic of the proposal.

(Multiple sponsors are encouraged, as they expand the feasible scope of the research that can be supported with UCTC funds.) An itemized budget is also included in Part B.

Due to funding reductions, budget restrictions were imposed in Year 13. Summer salary for faculty generally was limited to one month and most projects were limited to one graduate student researcher or undergraduate intern for the academic year. Costs of supplies, postage, computer expenses, travel, etc. were limited to \$1500 unless additional, itemized expenses were justified as necessary for the conduct of the research. Secretarial and clerical support services were not allowed

The 27 proposals received in response to the 2000-2001 RFP came from five UC campuses.

Proposal Review Process

All faculty research proposals undergo confidential external review by university researchers or practicing professionals in the field of transportation. The UCTC Director selects three or four persons to review each proposal; three completed reviews are required for each proposal. Additional reviewers are sought if those initially contacted are unable to complete their reviews in a timely fashion.

Reviewers are chosen based on their expertise with the subject matter of the proposal. They are drawn from universities, the US DOT, other federal agencies, Caltrans, other state agencies, regional agencies, local government, research groups, foundations and private organizations. Over 90 individuals served as reviewers for the Year 13 - 2000-2001 grant cycle.

External reviewers were asked to consider the following in their written evaluations:

- Extent to which the proposed research is original or creative and an important intellectual contribution to transportation scholarship
- Extent to which this research will advance professional practice or inform public opinion
- Appropriateness of the research methodology to the research question
- Appropriateness and feasibility of the data collection plan
- Reasonableness of the budget for the scope of work proposed (sufficient to allow for the successful completion of the project without being extravagant)
- Competence of the PI and other researcher(s) in the area of the proposed research
- Extent of student involvement
- Any other issues the reviewer deems important.

Review Selection Process

As noted in the introduction, the UCTC Director and Executive Committee experimented with a new review procedure this past year, with an expert committee advising us on the proposals of greatest merit. We resorted to this approach after realizing that we had far more proposals receiving excellent reviews than available funding could support. Our three experts, Dr. Edward Beimborn, Dr. Sandra Rosenbloom, and Dr. Randolph Hall, ranked the 27 proposals based on the reviews received and, particularly when reviews were mixed, their own evaluations.

The Executive Committee was primarily guided by outside reviewers' and expert committee's assessments in its selection of projects for funding. However, the Executive Committee also considers the PI's past performance on UCTC-funded projects and evaluates the overall fit of the proposed work to the UCTC theme. In addition, the Executive Committee takes into account the desirability of continuing an ongoing research project into a second phase, or initiating research on a new topic of importance.

Based on the assessments of the reviewers and the Executive Committee members, the Director may ask for certain changes to a proposal, for example, to fund selected tasks only, or may ask that the proposal be revised to respond to reviewers' concerns and submitted for reconsideration.

As in previous years, we received far more highly rated proposals than available funds could support. While we did provide funding to 15 of the 27 proposals received, half of those funded received only part of the support requested by the principal investigator. (See Research Status Reports section for descriptions of these projects and the work to date.)

Research Performance

The UCTC Director and administrator monitor research performance through periodic progress reports as well as through informal communications with researchers. We expect UCTC-funded researchers to publish their results, and consider their publication record in any subsequent applications for UCTC funding. We also provide funding for researchers to present their work at conferences and symposia, reprint papers sponsored by UCTC, and publish research in the form of working papers, and final reports, web page postings, and ACCESS magazine articles.

Our success in producing innovative, policy-relevant results is demonstrated by their use in practice. We count the following among the indicators of the success of our transportation research:

- adoption of UCTC-developed analysis methods
- use of UCTC-developed databases
- appointment of UCTC researchers to important policy-making and advisory positions
- invitations to testify before elected and appointed officials
- requests for meetings, briefings, and other collaborative activities and exchanges
- requests for technical assistance from UCTC researchers
- changes in federal, state, regional and local transportation policies following recommendations based on UCTC research.

Our research results also have proven useful to other researchers in academia, government, and the private sector, as evidenced by citations in the literature, invitations to participate in important conferences and meetings, requests for briefings, and other collaborative activities and exchanges. Some of these activities are documented in the research status reports presented later in this document.

Research into Practice

Advising the Legislature. Professors Elizabeth Deakin, Martin Wachs, Judith Innes, and Judith Gruber advised the California Senate and Assembly Transportation Committee members on key transportation policy issues in a session held in the State Capitol, Sacramento, in January 2001. Also in attendance were members of the California Transportation Commission and key staff members from a number of state and local agencies and interest groups.

Parking Cash-out Advising. Drawing upon the findings of his UCTC research, Professor Donald Shoup of UCLA has been advising the California Air Resources Board, on ways to improve implementation of the state's parking cash-out program. The ARB are taking steps to advertise the law, announce it on their web site, and to work with the Air Quality Management Districts to encourage compliance.

Sales Taxes for Transportation. Professor Martin Wachs, whose work on California transportation finance has been supported by the UCTC, appeared in a thirty minute video that is used by the Self Help Counties Coalition to publicize the role of county sales taxes in California transportation finance.

Environmental Justice Technical Support. The San Francisco Bay Area Metropolitan Transportation Commission and the Environmental Justice Working Group, representing environmental and community-based organizations, asked Prof. Elizabeth Deakin of UCTC to advise and provide technical support to the Regional Transportation Plan Update environmental justice analysis. Deakin is assisted by graduate students Jonathon Kass, Paula Armstrong, Maria Gil, and Scott McCray.

Freight Transportation Industrial Liaison. The freight transportation research group at UC Irvine, led by Prof. Amelia Regan with the participation of ITS researcher Thomas Golob and a baker's dozen of graduate and undergraduate students, has built upon UCTC-funded projects to develop new initiatives funded by JB Hunt Transportation, a major trucking firm, and Trantis, a subsidiary of market data Corporation, a freight transportation dot.com. The work with JB Hunt has involved both algorithm development for scheduling local truckload operations and the development of repair cost estimation models for large non-homogenous vehicle fleets. The work with Trantis involves the development of game theoretic models, and simulation models for on-line freight transportation exchanges.

Energy Emissions Trading. Deborah Salon, a grad student on Daniel Sperling's UCTC sponsored project, was invited to spend three months at the International Energy Agency in Paris to develop a strategy for developing baselines to use for international transportation emissions trading.

Technology Transfer

The UCTC's goal for technology transfer is the availability of research results in a form that a variety of users can readily apply. We view technology transfer as including publications, both on the web and in hard copy; continuing education offerings; conferences and symposia; policy advising and public service; and outreach efforts to business and community groups and the general public. Their ultimate objectives are to increase public understanding of transportation problems and opportunities for improvement, and to produce a cadre of skilled, creative, connected transportation professionals who will effectively address these problems and develop innovations and improvements.

The UCTC encourages its researchers to engage in a variety of public service and professional activities, through which they communicate UCTC-funded research findings to a broad audience. These activities include appointments to committees and boards of federal, state, regional, and local transportation agencies; provision of expert testimony and advice to the Congress, State Legislatures, and regional and local bodies; technical assistance to public and private transportation organizations; and public service on transportation and related matters. When needed, the UCTC provides travel expenses or other support to enable faculty to provide these public services.

As the Research into Practice section illustrates, our faculty and students regularly are asked to advise government and the private sector. The UCTC also provides information on transportation to the general public. We do this through faculty participating in lectures, symposia and other events designed to inform the general public and by working with the popular press to educate a broader audience on transportation issues. We have asked our staff editor, a former writer for a local paper, to make special efforts to communicate our research results to her colleagues in the press.

Publications

The UCTC considers publications to be a vital way to communicate our research findings. Each project funded by the UCTC ordinarily produces several papers and reports, which we disseminate both in hard copy and increasingly, on the Web. In addition, we produce the twice-yearly ACCESS Magazine, which summarizes UCTC-sponsored work in a style designed for a general audience.

In 2000-2001, our faculty associates added 95 publications to our list, bringing the total to 514 papers and reports. In addition, we now list a dozen books and three videos produced with UCTC support. Graduate students also completed several dissertations funded with UCTC's assistance.

We distribute UCTC publications free of charge, and also make reprints of UCTC-funded journal articles available. Approximately 1000 requests for papers and articles were filled in 2000-2001. In addition, we have over 15,000 subscribers to ACCESS magazine, and additional readers on the Web. ACCESS has proven to be an especially valuable way to communicate our work to a broad audience; academics, business leaders, elected officials, and government staff members all over the United States and abroad read ACCESS. Many of our publications also can be downloaded from our website. We get over 1200 "hits" a month.

Table 2 lists the papers added to the UCTC publications in 2000-2001. Note that some of these papers derive from UCTC research funded in previous years; likewise we expect that future lists will include additional papers funded by the UCTC in 2000-2001. For a full listing of publications, see the UCTC website.

We are especially pleased that our faculty continue to receive awards and honors for their publications. Marlon Boarnet's UCTC-sponsored paper, "New Highways, Urban Development, and Induced Travel," won the Fannie Mae Foundation prize for best paper on a housing and community development topic at the 2000 American Collegiate Schools of Planning meeting.

Conferences and Symposia

In addition to publishing all work supported by the Center, UCTC grant recipients are expected to participate in occasional UCTC-sponsored conferences and symposia, including the annual student conference sponsored by the UCTC. We expect UCTC researchers to give public lectures and seminars in the ongoing events series held at the four campuses, as well as in national and international meetings on transportation research and practice. Travel to conferences is supported as part of research grants, and additional travel grants are made on a case-by-case basis when funds are available.

Numerous UCTC affiliates participate each year in the annual meeting of the Transportation Research Board in Washington, DC. In 2000-2001, three dozen faculty members affiliated with UCTC presented

papers at TRB. . In addition, the UC Transportation Center jointly hosted a reception at TRB with ITS Berkeley, attended by over 300 faculty, students, and friends.

UCTC has been a major sponsor of two permanent conferences, the annual Lake Arrowhead Conference on the Transportation/Land Use/ Air Quality Connection and the biennial Asilomar Conference on Transportation and Energy Policy. These conferences bring together policy makers and opinion leaders in retreat settings to discuss critical policy issues facing the region. They have been widely cited as effective and influential. Several important pieces of transportation legislation, such as the California Employer Parking Cashout legislation and efforts to incorporate remote sensing of vehicular air pollutants into ongoing state pollution control programs, originated from discussions that have taken place at these conferences. This year's Lake Arrowhead conference is discussed in more detail later in this document.

UCTC also helps faculty members to organize special research conferences and events as opportunities arise. Dinner seminars organized by the Institute of Urban and Regional Development at UC Berkeley and research seminars organized by the Institute of Transportation Studies at UC Davis have become regular events with UCTC support, and attract elected officials and public and private agency leaders as well as academics.

Finally, the UCTC student conference is an annual event of growing importance to the transportation community at the various campuses. Students at the UC Berkeley, Davis, Irvine and UCLA campuses take turns organizing the conference, which includes student presentations and poster sessions and allows transportation students and faculty from all of the UC campuses to meet and interact. Caltrans representatives also attend the conference and meet with students there. Students from the other two transportation centers in California are invited to participate as well.

Highlights - UCTC-Sponsored Conferences and Symposia, 2000-2001

Fall 2000 Lake Arrowhead Transportation / Land Use / Air Quality Symposium

The Fall 2000 Lake Arrowhead Transportation / Land Use / Air Quality Symposium, convened by the UCLA Extension Public Policy Program in association with UCTC and a number of government, private and nonprofit sponsors, was held on October 24-26, 2000. The Fall 2000 sessions focused on Growth and Quality of Life issues in the context of transportation, land use and the environment. A critical component of the discussions was focused on how cities and regions can accommodate new residents while protecting and even improving the existing quality of life. Will projected growth really materialize? Where will residents and jobs locate and how will people get around? What are the environmental consequences of expected growth? Should policy officials and planners encourage, accommodate, manage, or in some cases, discourage growth? Does growth of such great scale call for different land use decisions and transportation investments? What transportation tools, regulations, incentives and institutional arrangements are needed to protect quality of life and environment while we still enjoy the benefits of economic growth?

The invitational retreat had 135 participants, including academics and researchers from UC and other universities, federal, state and local policymakers and advisors, public agencies in the transportation and air quality realms; environmental organizations; and private industry (e.g. developers, utilities, and other industry groups). The sessions were organized to engage policy-makers, practitioners, and researchers in in-depth discussions, allowing participants to probe issues, explore alternate explanations, and deliberate about the issues they see as genuinely relevant.

Transportation Research Board Annual Meeting, January 7-11, 2001

Three dozen faculty members affiliated with UCTC presented papers at the annual meeting of the Transportation Research Board this January 7-11, 2001, in Washington, DC. In addition, the UC Transportation Center jointly hosted a reception at TRB with ITS Berkeley. Over 300 faculty and students from all UC campuses and friends old and new joined us for good company and good cheer. The reception was held Monday, January 8 in the Omni Shoreham Hotel, Bird Cage Room.

2001 UCTC Student Conference

Students at the UC Irvine Institute of Transportation Studies hosted the 7th Annual UCTC Student Research Conference on February 9-10, 2001. The conference theme was "Emerging Perspectives on Travel Analysis". For the first time this year, student speakers and poster sessions were complemented by a faculty research symposium at which four faculty members presented their UCTC-sponsored research.

We were also honored to have two guest speakers for the event. Mr. Francis Francois, an internationally recognized leader in transportation administration and finance, gave the luncheon address. That evening, the 3rd Annual Mel Webber Lecture was presented at the conference dinner by Dr. Hani Mahmassani, L.B. Meaders Professor of Civil Engineering at the University of Texas at Austin and Director of The Advanced Institute of Transportation Infrastructure Engineering and Management.

Sustainable Transport: Can We Learn Anything From European Cities? Berkeley Symposium, March 2001

This symposium, attended by approximately 60 students, faculty members, public officials, and community members, featured an address by Prof. Carmen Hass-Klau, Professor of Civil Engineering: Transport and Public Transport Systems at the University of Wuppertal, Germany. Hass-Klau presented an overview of key transport policies in Europe - pedestrianization in Germany, traffic calming in the Netherlands and public transport concepts in Zurich and Freiburg – and discussed the emergence of the concept of sustainable transport. She then considered whether the European experience can be applied to US conditions, sparking a wide-ranging discussion among those in attendance.

Table 2. UCTC 2000-2001 Publications

Brown, Jeffrey, Daniel Hess, and Donald Shoup	Unlimited Access	2000, Fall	420
Brodrick, Christie-Joy, Daniel Sperling, and Christopher Weaver	Multiple Smoke Opacity Measurements as Indicators of Particulate Emissions for Heavy-Duty Diesel Vehicle Inspection and Maintenance Programs	2000, Fall	421
Rodier, Caroline J., and Robert A. Johnston	A Comparison of High Occupancy Vehicle, High Occupancy Toll, and Truck-Only Lanes in the Sacramento Region	2000, Fall	422
Marston, James R. and Reginald G. Golledge	Towards an Accessible City: Removing Functional Barriers for the Blind and Vision Impaired: A Case for Auditory Signs	2000, Fall	423
Cervero, Robert and John Beutler	Adaptive Transit: Enhancing Suburban Transit Services	2000, Fall	424
Loukaitou-Sideris, Anastasia, and Tridib Banerjee	The Blue Line Blues: Why the Vision of Transit Village May Not Materialize Despite Impressive Growth in Transit Ridership	2000, Fall	425
Boarnet, Marlon G. and Saksith Chalermpong	New Highways, Urban Development, and Induced Travel	2000, Fall	426
Johnston, Robert A. and Dorriah L. Page	Automating Urban Freeways: Financial Analysis for User Groups	2000, Fall	427
Johnston, Robert A. and Raju Ceerla	Systems-Level Evaluation of Automated Urban Freeways	2000, Fall	428
Johnston, Robert A. and Raju Ceerla	The Effects of New High-Occupancy Vehicle Lanes on Travel and Emission	2000, Fall	429
Johnston, Robert A. and Caroline J. Rodier	Regional Simulations of Highway and Transit ITS: Travel, Emissions, and Economic Welfare Effects	2000, Fall	430
Johnston, Robert A. and Raju Ceerla	Travel Modeling With and Without Feedback to Trip Distribution	2000, Fall	431
Rodier, Caroline J. and Robert A. Johnston	Method of Obtaining Consumer Welfare from Regional Travel Demand Models	2000, Fall	432
Rodier, Caroline J. and Robert A. Johnston	Travel, Emissions, and Welfare Effects of Travel Demand Management Measures	2000, Fall	433
Deakin, Elizabeth, Greig Harvey, Randall Pozdena, Geoffrey Yarema	Transportation Pricing Strategies for California: An Assessment of Congestion, Emissions, Energy. And Equity Impacts	2000, Fall	434
Cervero, Robert, Onésimo Sandoval, and John Landis	Transportation as a Stimulus to Welfare-to-Work: Private Versus Public Mobility	2000, Fall	435
Cervero, Robert	Transport and Land Use: Key Issues in Metropolitan Planning and Smart Growth	2000, Fall	436

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Regan, Amelia C. and Thomas F. Golob	Freight Operators' Perceptions of Congestion Problems and the Application of Advanced Technologies: Results from a 1998 Survey of 1200 Companies Operating in California	2000, Fall	437
Regan, Amelia C. and Thomas F. Golob	Trucking Industry Perceptions of Congestion Problems and Potential Solutions in Maritime Intermodal Operations in California	2000, Fall	438
Golob, Thomas F.	A Simultaneous Model of Household Activity Participation and Trip Chain Generation	2000, Fall	439
Golob, Thomas F.	Joint Models of Attitudes and Behavior in Evaluation of the San Diego I-15 Congestion Pricing Project	2000, Fall	440
Recker, W. W., C. Chen, and M. G. McNally	Measuring the impact of efficient household travel decisions on potential travel time savings and accessibility gains	2000, Fall	441
Recker, W. W. and A. Parimi	Development of a Microscopic Activity-Based Framework for Analyzing the Potential Impacts of Transportation Control Measures on Vehicle Emissions	2000, Fall	442
Cervero, Robert	The Planned City: Coping With Decentralization: an American Perspective	2000, Fall	443
Cervero, Robert	Road Supply-Demand Relationships: Sorting Out Causal Linkages	2000, Fall	444
Recker, Wilfred W.	The Household Activity Pattern Problem: General Formulation and Solution	2000, Fall	445
Recker, Wilfred W.	A Bridge between Travel Demand Modeling and Activity-Based Travel Analysis	2000, Fall	446
Golob, Thomas F., Amelia C. Regan	Impacts of Highway Congestion on Freight Operations: Perceptions of Trucking Industry Managers	2000, Fall	447
Glazer, Amihai	Inducing investments and regulating externalities by command versus taxes	2001, Winter	448
Gersbach, Hans and Amihai Glazer	Markets and regulatory hold-up problems	2001, Winter	449
Glazer, Amihai and Esko Niskanen	Which consumers benefit from congestion tolls?	2001, Winter	450
Glazer, Amihai	Time Consistency of Congestion Tolls	2001, Winter	451
Glazer, Amihai and Kai A. Konrad	Ameliorating congestion by income redistribution	2001, Winter	452
Glazer, Amihai and Esko Niskanen	Parking fees and congestion	2001, Winter	453
Glazer, Amihai and Esko Niskanen	Why voters may prefer congested public clubs	2001, Winter	454
Stein, Aram G. and Kenneth S. Kurani, and Daniel Sperling	Roadway Infrastructure for Neighborhood Electric Vehicles	2001, Winter	455
Lipman, Timothy E., Kenneth S. Kurani, and Daniel Sperling	Incentive Policies for Neighborhood Electric Vehicles	2001, Winter	456

Table 2 cont.

Setiawan, Winardi and Daniel Sperling	Premium Gasoline Overbuying in the U.S.: Consumer-Based Choice Analysis	2001, Winter	457
Lipman, Timothy E., Kenneth S. Kurani, and Daniel Sperling	Regulatory Impediments to Neighborhood Electric Vehicles: Safety Standards and Zero-Emission Vehicle Rules	2001, Winter	458
Sperling, Daniel and Michael Replogle	Intelligent and Environmentally-Sensible Transportation System: An Alternative Vision	2001, Winter	459
Turrentine, Thomas and Kenneth S. Kurani	The Household Market for Electric Vehicles: Testing the Hybrid Household Hypothesis -- A Reflexively Designed Survey of New-Car-Buying Multi-Vehicle California Households	2001, Winter	460
Kurani, Kenneth S., Thomas Turrentine, and Daniel Sperling	Testing Electric Vehicle Demand in "Hybrid Households" Using a Reflexive Survey	2001, Winter	461
Kurani, Kenneth S., Daniel Sperling, Timothy Lipman, Deborah Stanger, Thomas Turrentine, and Aram Stein	Household Markets for Neighborhood Electric Vehicles in California	2001, Winter	462
Sperling, Daniel	The Case for Electric Vehicles	2001, Winter	463
Sperling, Daniel	Rethinking the Car of the Future	2001, Winter	464
Lipman, Timothy E. and Daniel Sperling	Forecasting Electric Vehicle Costs with Experience Curves	2001, Winter	465
Nesbitt, Kevin and Daniel Sperling	Myths Regarding Alternative Fuel Vehicle Demand by Light-Duty Vehicle Fleets	2001, Winter	466
Shaheen, Susan, Daniel Sperling, and Conrad Wagner	Carsharing in Europe and North America: Past, Present, and Future	2001, Winter	467
Shaheen, Susan, Daniel Sperling, and Conrad Wagner	Carsharing and Partnership Management: An International Perspective	2001, Winter	468
Salon, Deborah, Daniel Sperling, Susan Shaheen, and Dan Sturges	New Mobility: Using Technology and Partnerships to Create More Sustainable Transportation	2001, Winter	469
Salon, Deborah, Daniel Sperling, and David Friedman	California's Partial ZEV Credits and LEV II Program	2001, Winter	470
Golledge, Reginald G.	Geographical Theories	2001, Winter	471
Golledge, Reginald G., Jack M. Loomis, and Roberta L. Klatzky	A New Direction for Applied Geography	2001, Winter	472
Golledge, Reginald G.	The Relationship Between Geographic Information Systems and Disaggregate Behavioral Travel Modeling	2001, Winter	473
Marston, James R., Reginald Golledge, and C. Michael Costanzo	Investigating travel behavior of nondriving blind and vision impaired people: The role of public transit	2001, Winter	474
Marston, James R., and Reginald Golledge	Removing functional barriers: Public transit and the blind and vision impaired	2001, Winter	475
Marston, James R., and Reginald G. Golledge	Improving Transit Access for the Blind and Vision Impaired	2001, Winter	476

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Albert, William S., and Reginald G. Golledge	The Use of Spatial Cognitive Abilities in Geographic Information Systems: The Map Overlay Operation	2001, Winter	477
Golledge, Reginald G., James R. Marston, and C. Michael Costanzo	Attitudes of Visually Impaired Persons Toward the Use of Public Transportation	2001, Winter	478
Golledge, Reginald G., James R. Marston, and C. Michael Costanzo	The Impact of Information Access on Travel Behavior of Blind or Vision Impaired People	2001, Winter	479
Small, Kenneth A.	Using the Revenues from Congestion Pricing	2001, Winter	480
Dill, Jennifer, Todd Goldman, and Martin Wachs	California Vehicle License Fees: Incidence and Equity	2001, Winter	481
Ang-Olson, Jeffrey, Martin Wachs, and Brian D. Taylor	Variable-Rate State Gasoline Taxes	2001, Winter	482
Hill, Mary C., Brian D. Taylor, Asha Weinstein, and Martin Wachs	Assessing the Need for Highways	2001, Winter	483
Wachs, Martin	New Expectations for Transportation Data	2001, Winter	484
Li, Jianling and Martin Wachs	A test of inter-modal performance measures for transit investment decisions	2001, Winter	485
Wachs, Martin	Linkages Between Transportation Planning and the Environment	2001, Winter	486
Wachs, Martin	Refocusing Transportation Planning for the 21st Century	2001, Winter	487
Taylor, Brian D., Asha Weinstein, and Martin Wachs	Reforming Highway Finance	2001, Winter	488
Wachs, Martin	The Motorization of North America: causes, consequences, and speculations on possible futures	2001, Winter	489
Raney, Elizabeth A., Patricia L. Mokhtarian, and Ilan Salomon	Modeling individual's consideration of strategies to cope with congestion	2001, Winter	490
Kean, Andrew J., Robert A. Harley, David Littleton, and Gary R. Kendall	On-Road Measurement of Ammonia and Other Motor Vehicle Exhaust Emissions	2001, Winter	491
Contadini, J. Fernando, Robert M. Moore, Daniel Sperling, and Meena Sundaresan	Life-Cycle Emissions of Alternative Fuels for Transportation: Dealing with Uncertainties	2001, Winter	492
Brodrick, C.J., M. Farsh-chi, H.A. Dwyer, D. Sperling, S.W. Grouse, W. Doelling, J. Hoelzer, and M. Jackson	Urea-SCR System Demonstration and Evaluation for Heavy-Duty Diesel Trucks	2001, Winter	493
Lipman, Timothy E., and Daniel Sperling	Forecasting the Costs of Automotive PEM Fuel Cell Systems: Using Bounded Manufacturing Progress Functions	2001, Winter	494
Garrison, William L.	Technological Changes and Transportation Development	2001, Winter	495
Garrison, William L.	Innovation and Transportation's Technologies	2001, Winter	496

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Fielding, Gordon J.	Private Toll Roads: Acceptability of Congestion Pricing in Southern California	2001, Winter	497
Loukaitou-Sideris, Anastasia	Transit-Oriented Development in the Inner City: A Delphi Survey	2001, Winter	498
Loukaitou-Sideris, Anastasia	Revisiting Inner-City Strips: A Framework for Community and Economic Development	2001, Winter	499
Jacobs, Allan B., Yodan Y. Rofe, and Elizabeth Macdonald	Guidelines for the Design of Multiple Roadway Boulevards	2001, Winter	500
Jacobs, Allan B., Yodan Y. Rofe, and Elizabeth S. Macdonald	Another Look at Boulevards	2001, Winter	501
Dahlgren, Joy	In What Situations Do High Occupancy Vehicle Lanes Perform Better Than General Purpose Lanes	2001, Winter	502
Dahlgren, Joy	HOV Lanes: Are they the best way to reduce congestion and air pollution	2001, Winter	503
Dahlgren, Joy	High Occupancy Vehicle Lanes: Not Always More Effective Than General Purpose Lanes	2001, Winter	504
Singer, Brett C., Thomas W. Kirchstetter, Robert A. Harley, Gary R. Kendall, and James M. Hesson	A Fuel-Based Approach to Estimating Motor Vehicle Cold-Start Emissions	2001, Winter	505
Shoup, Donald C., and Mary Jane Breinholt	Employer-Paid Parking: A Nationwide Survey of Employers' Parking Subsidy Policies	2001, Winter	506
Shoup, Donald C.	In Lieu of Required Parking	2001, Winter	507
Shoup, Donald C.	The trouble with minimum parking requirements	2001, Winter	508
Shoup, Donald C., and Jeffrey Brown	Pricing Our Way Out of Traffic Congestion: parking cash out and HOTlanes	2001, Winter	509
Johnston, Robert A., and Tomas de la Barra	Comprehensive regional modeling for long-range planning: linking integrated urban models and geographic information systems	Winter 2001	510
Hansen, Mark, David Gillen, and Mohnish Puvathingal	Freeway Expansion and Land Development: An Empirical Analysis of Transportation Corridors	2001, Winter	511
Small, Kenneth A., and Jia Yan	The Value of "Value Pricing" of Roads: Second-Best Pricing and Product Differentiation	2001, Winter	512
Webber, Melvin M.	The Joys of Spread-City	2001, Winter	513
Innes, Judith E., and Judith Gruber	Bay Area Transportation Decision Making in the Wake of ISTEA: Planning Styles in Conflict at the Metropolitan Transportation Commission	2001, Spring	514

RESEARCH PROJECTS STATUS

This section presents a description and a status report for each of the 15 research projects funded by the UC Transportation Center in Year 13 – 2000-2001. In addition, 12 projects funded in Year 12 and continuing into Year 13 are reported here.

UCTC projects ordinarily are funded for one year only. However, because of because of delays in the receipt of research funds in 1999-2000 and delays in project account preparation due to the installation of new campus accounting systems in 2001, many projects were unable to start in the fall academic term, and a few were delayed even longer. Consequently, all projects were granted extensions; a final completion date of June 2002 is currently anticipated.

The projects for each year are listed in Tables 3 and 4. Please note that all UCTC projects include funding for one or two graduate student research positions and for one or two faculty summer months. Other faculty time during the academic year is donated.

Table 3. Year 12 (1999-2000) Projects (20 Projects)

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

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

GIS-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

Roadway Tunnel Measurements of Carbon and Nitrogen-Containing Air Pollutants

Robert Harley, Civil & Environmental Engineering, Berkeley

The Effects of Urban Land Use Patterns on Household Trip-Making Behavior: An Empirical Analysis

John D. Landis, City & Regional Planning, Berkeley

Estimation of Latent Pavement Properties Using Condition Survey Data

Samer M. Madanat, Civil and Environmental Engineering, 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 (Yr. 2)

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

Online Versus Rolling Horizon Algorithms for Dynamic Service Fleet Operations

Amelia Regan and Sandra Irani, Civil & Environmental Engineering

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

Table 3 cont.

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

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

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Table 4. Year 13 (2000-2001) Research Projects (15 Projects)

Stationary Traffic Models and Freeway Geometry

Michael Cassidy, Civil and Environmental Engineering, UC Berkeley

Does Commuting Distance Matter? Commuting Tolerance and Residential Change

William A.V. Clark, Geography, UCLA

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

An Evaluation of Local Option Transportation Taxes in California

Professor Martin Wachs, Institute of Transportation Studies, UC Berkeley

Understanding and Modeling Driver Behavior in Dense Traffic Flow

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

Status Reports

The following reports present the status of each faculty research project underway at UCTC in 2000-2001. The reports cover performance through July 31, 2001. Year 12 projects continued into Year 13 because of late receipt of funds, delays caused by the installation of new accounting systems on several campuses, and the change in period of performance from an end date of Sept. 30 to the current end date of July 31 for the UCTC grant period.

1999-2000 Projects (Year 12)

The Transportation Behavior and Needs of Welfare Recipients

Principal Investigator:

Evelyn Blumenberg
Public Policy and Social Research
3250 Public Policy Building
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Abstract:

This study applies survey research and data analysis to investigate travel patterns and identify transport needs of welfare recipients. In particular, the study will focus on the travel patterns and needs of Southeast Asian welfare participants in Los Angeles and Fresno Counties. **Key Words:** welfare-to-work, transportation needs, survey research

Work Completed to Date:

A contract was negotiated, allowing the research team access to confidential data from which to draw a sample of welfare recipients. A survey instrument was developed and tailored to the project, and was approved by the UCLA Human Subjects Committee. A sample of welfare participants was drawn, and the survey was translated into Spanish and Hmong. The survey was administered in May 2001 and is being analyzed.

Papers to Date:

None.

Conferences Attended:

None to date

Other Accomplishments:

None to date

Percent Complete:

70%

Direct Cost:

\$15,085

New Highways and Urban Growth Patterns: Using Locally Weighted Regression to Measure the Development Impacts of the Orange County Toll Roads

Principal Investigator:

Marlon Boarnet
Urban & Regional Planning & Institute of Transportation Studies
University of California, Irvine
Irvine, CA 92697-3600
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Fax (949) 824-8385
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Abstract:

Recent prominent discussions of the link between highways, urban decentralization and induced automobile travel have created a need to better understand the specific nature of any influence that new highways have on urban development. This research will use econometric models of house sales prices and census tract population and employment growth to examine whether and how toll roads have changed land values and, by extension, development patterns in Orange County, California. The research will carefully examine how house prices and census tract population and employment were influenced by the opening of the county's extensive toll road network. Such a test has never been done using advanced empirical techniques, with the extensive data that are currently available, and in the context of a road building project as extensive as the recent construction of the three major toll roads in Orange County. The results of this research will provide the first statistically and theoretically sound "before and after" test of the effect of highways on urban growth patterns. **Key words:** highways, urban development, land use-transportation link, econometric models

Work Completed to Date:

Most of the research tasks in this project are complete or substantially complete. We have analyzed the impact of the Orange County toll roads on house prices, using hedonic regression methods. That analysis has been presented at three conferences, is under submission at a refereed journal, and a preliminary paper won a conference award. The analysis is based on home sales data for Orange County, California from 1988 through early 2000. The data were cleaned and address matched using a GIS program. Distances from each house to the nearest toll road and highway on-ramps were calculated. Several different regression techniques were used to analyze the impact of the Orange County toll roads on housing prices and development. Results show that the toll roads influenced house prices along nearby corridors.

Papers to Date:

"New Highways, Urban Development, and Induced Travel," working paper presented at conferences below and under submission at a refereed journal.

Conferences Attended:

- American Collegiate Schools of Planning, Nov. 2000
- North American Regional Science Association, Nov., 2000
- EPA symposium on induced travel, Berkeley, CA, June, 2000
- Transportation Research Board Annual meeting, 2001

Other Accomplishments:

The first paper from this project, "New Highways, Urban Development, and Induced Travel," won the Fannie Mae Foundation prize for best paper on a housing and community development topic at the 2000 American Collegiate Schools of Planning meeting.

Percent Complete:

95%

Direct Costs:

\$32,199

Induced Travel Demand: A Systems Analysis of Longer Term Impacts of Road Expansion

Principal Investigator:

Robert Cervero
City and Regional Planning
228 Wurster Hall
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Abstract:

Induced travel demand has been mired in legal and political controversy in recent years. This project will examine the longer term structural forces behind induced increases in traffic following road expansion. Using the technique of path analysis, the research will investigate the degree to which traffic volume increases over a four- to six-year time frame are accounted for by land development and land-use changes as well as increased vehicle ownership along impacted corridors. Whether road improvements function more as lead or lag factors in explaining structural shifts in land use and vehicle ownership was investigated. **Key Words:** induced travel demand, path analysis, land-use impacts, case studies

Work Completed to Date:

Analyses have demonstrated that road supply-demand relationships work in both directions, with investments shaping demand but demand also influencing decisions on capacity expansions. Based on 18 years of California data and using simultaneous econometric techniques, the elasticity of demand as a function of road investments was found to be higher than the elasticity of demand of road supply based on past travel levels, though both elasticities were significant. The analysis also demonstrated that variations in road investments are significantly shaped by political and socio-economic factors, in addition to needs-based influences like rising traffic levels. Work is presently continuing on tracing the causal chain of events between road investments and structural changes, notably building permit activities, which in turn induce travel. To the degree that induced demand are found to be a consequence of long-term structural adjustments, land-use management and planning gains all the more importance as a mechanism for managing traffic levels.

Papers to date:

"Road Supply and Demand Relationships: Unraveling the Causal Chain" To be presented at the Annual TRB Meeting, January, 2001

Conferences Attended:

TRB, 2001

Other Accomplishments:

A draft of the paper was presented at a special conference on Induced Demand, sponsored by the U.S. Environmental Protection Agency and the Federal Highway Administration, and the University of California Transportation Center, held at UC Berkeley in June 2000.

Percent Complete:

100%

Direct Cost:

\$50,000

Measuring the Impact of the Internet on the Trucking Industry

Principal Investigator:

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Abstract:

The internet is both a challenge and an opportunity for the trucking industry. The recent growth in internet e-commerce is reshaping distribution patterns for trucking firms. Trucking firms are also changing their operations as a result of the internet (e.g. with on-line load matching). To survive they must adapt to the new demand patterns and exploit technological advantages. A deep understanding of the forces shaping the trucking industry in this new environment is essential for effective public policy-making. This research would examine 1) how individual firms of different kinds should alter their operation plans, 2) the resulting changes to their costs, 3) the effect of the internet on the competitiveness of firms in various sectors of the industry, and 4) the ensuing structural changes to the industry as a whole. **Key words:** internet, trucking industry, logistics, operations plans

Work Completed to Date:

We expect to produce as an outgrowth of this project one PhD thesis (K. Smilowitz's) that deals with the optimal structure of multi-commodity multi-service transportation networks such as those of integrated carriers (e.g., UPS). One working paper, dealing with a highly technical aspect of the thesis, was recently finished. Two other students are now in the formative portions of their work; one will work on the "last mile" problem of e-commerce firms and the other one on dynamic (many-to-many) routing problems that arise in related contexts.

Papers to date:

-Daganzo, Carlos and Karen Smilowitz, "Asymptotic Approximations for the Transportation LP and Other Scalable Network Problems", ITS WP 2000-2, November 2000. (revised) submitted to *Math Opns. Res.* (February, 2001)
-Daganzo, Carlos and Karen Smilowitz, "Asymptotic Approximations for Some One Dimensional Network Flow Problems." Accepted for TRISTAN, June 2001.

Conferences Attended:

INFORMS (GSR K. Smilowitz), Spring 2000
TRB (GSRs K. Smilowitz and J.C. Munoz), January 2001

Other Accomplishments:

None to date

Percent Complete:

70%

Direct Cost:

\$55,600

GPS-Based Data Handling for Activity Based Modeling

Principal Investigator:

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Abstract:

We will use the U.S. Department of Transportation's GPS-generated Lexington Travel Data to conduct a detailed spatial and temporal analysis of activities, including single-trips and trip chains and compare it with the data needs of SMASH and ALBATROSS, two leading packages for activity analysis, and we will conceptually define how a GIS can be adapted to perform the analytical functions required by SMASH and ALBATROSS. Finally, we will try to adapt the Santa Barbara-based GISICAS CPM to handle these requirements. **Key Words:** GIS, behavioral travel model, GPS, activity analysis

Work to Date:

We have examined the Lexington database, have determined the extent of the data that can be analyzed, and have calculated day by day correlations of activity patterns, grouped functions and activities with similar spatial and temporal occurrence patterns. We calculated spectral signature for daily and weekly activity patterns, calculated distance traveled to activity source using circular statistics, and conducted discriminant analysis to define different clusters of activities that differentiate daily behavior patterns. The GPS tracked data shows that Monday, Tuesday, and Wednesday produced remarkably similar spatio-temporal patterns, while Fridays were clearly demarcated at hosting different behaviors, different travel times, and different distances traveled.

Papers to date:

-Zhou, J. and Golledge, R. A GPS-based Analysis of Household Travel Behavior. Presented at the 39th Annual Meeting of the Western Regional Science Association, Kauai, Hawaii, February 26-March 1, 2000.
-Zhou, J. and Golledge, R. An Analysis of Household Travel Behavior Based on GPS. Presented at IATBR Conference, Gold Coast, Australia, July 2000.
-Zhou, J. Analysis of Variability of Weekly Travel Behavior Using GPS-Recorded Data - A thesis submitted for the degree of Master of Arts in Geography by Jianyu (Jack) Zhou

Conferences Attended:

-39th Annual Meeting of the Western Regional Science Association, Kauai, Hawaii, February 26-March 1, 2000.
-IATBR Conference, Gold Coast, Australia, July 2000.

Other Accomplishments:

None to date

Percent Complete:

90%

Direct Cost:

\$25,552

Impacts of Shipping Changes on the Efficiency of the Freight Transportation Network

Principal Investigators:

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Abstract:

Manufacturing and distribution systems have undergone significant changes in recent years; "just-in-time" production and distribution systems have led to an increase in the number of time-sensitive freight movements. Time-definite services and regular updates on the status of en-route shipments is expected of many shippers. Additionally, freight movements take place in smaller units, increasing overall freight movements. This study extends an earlier study of the trucking industry in California by focusing on the impacts of shipper decisions on performance of the highway transportation system. Information will be gathered using both stated preference and revealed preference survey techniques. Forecasts of future freight transport growth will be developed and of likely changes in the configuration of the freight network in southern California. **Key Words:** freight demand modeling, commercial vehicle operations, urban goods movement, shipper behavior

Work to Date:

We began with an in-depth examination of the 3rd Party Logistics Industry. This examination is detailed in "An Industry in Transition: Third Party Logistics in the Information Age," Regan, Amelia C. and Jiongjiong Song, CD Rom proceedings of the 80th meeting of the transportation research board. We have developed two surveys for early 2001 deployment. The first is a survey of the trucking industry to be launched as a CATI survey with funding from a closely related PATH project (the path project studies ATIS in the trucking industry). The second is an on-line survey of the 3PL industry which will launch in February. Results will inform the development of a survey of shippers which will launch in April and May. The survey results will be analyzed in the Spring and Summer of 2001.

Papers to date:

-Regan, Amelia C. and Jiongjiong Song, "An Industry in Transition: Third Party Logistics in the Information Age," Proceedings of the 80th meeting of the TRB, (2000).

The above paper is under revision for January 2001 submission to a special issue of the Transportation Journal.

-Golob, T.F. and A.C. Regan (2000), Impacts of Information Technology on Personal Travel and Commercial Vehicle Operations: Research Challenges and Opportunities, Transportation Research, Part C, in press.

Conferences Attended:

TRB 2001

Other Accomplishments:

Project has caught the attention of industry professionals, who have expressed interest in the work.

Percent Complete:

75%

Direct Cost:

\$30,601

Roadway Tunnel Measurements of Carbon and Nitrogen-Containing Air Pollutants

Principal Investigator:

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Civil & Environmental Engineering
University of California, Berkeley
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Abstract:

Motor vehicles are a significant source of air pollution, especially in urban areas, so major efforts have been made to control the emissions from vehicles. Catalytic converters are one of several control strategies in use to reduce emissions but concerns have been expressed about the possibility of undesirable side effects of catalytic converter use. The goal of this research is to measure the emissions of carbon and nitrogen-containing air pollutants from on-road vehicles during summer 1999. Special attention will be given to measuring ammonia emissions which are thought to have increased since the introduction of 3-way catalytic converters. These measurements will be used to assess trends in emissions associated with changes in vehicle technologies and fuels, in anticipation of a phase-out of MTBE in gasoline, and major air quality field studies planned in northern/central California in the year 2000.

Key Words: vehicle emissions, air quality

Work to Date:

Ammonia and other vehicle exhaust emissions were measured from a large sample of on-road vehicles using California Phase 2 reformulated gasoline. Measurements were made in the center bore of a San Francisco Bay area highway tunnel on eight 2-h afternoon sampling periods during summer 1999. Ammonia concentrations were divided by total carbon (mainly CO₂) concentrations to compute an emission factor of 475 +/- 29 mg/L. Emissions of nitrogen oxides (NO_x) and carbon monoxide (CO) have been measured at this site since 1994. From 1994 to 1999, emissions decreased by 41 +/- 4% for NO_x and 54 +/- 6% for CO. While use of three-way catalytic converters has contributed to decreases in NO_x and CO emissions, their use, in combination with fuel-rich engine operation, is the likely cause of ammonia emissions from motor vehicles observed in this study.

Papers to date:

Kean, A.J. et al., "On-road measurement of ammonia and other motor vehicle exhaust emissions", *Environ. Sci. Technol.*, vol. 34, pp. 3535-3539, (2000).

Conferences Attended:

Coordinating Research Council (CRC) Workshop on On-Road Vehicle Emissions, San Diego, March 2000.

Other Accomplishments:

None to date.

Percent Complete:

100%

Direct Cost:

\$38,235

The Effects of Urban Land Use Patterns on Household Trip-Making Behavior: An Empirical Analysis

Principal Investigator:

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Abstract:

Little empirical work has been done to confirm or reject the belief, held by most planners, that land use patterns and forms significantly affect travel behavior. Studies of household trip-making behavior typically focus on household economic and demographic characteristics, regional activity patterns and densities, and the availability and cost of competing travel modes, usually to the exclusion of local land use measures. We propose to measure the statistical relationships between non-work travel behavior in the San Francisco Bay Area and the distribution and quality of nearby land uses (including transportation facilities and transportation-related land uses). Using 1) a 1995 household travel survey conducted by the Metropolitan Transportation Commission, and 2) a data set of urban land uses collected by the Association of Bay Area governments, we propose to test the hypothesis that households which reside in cities with a "fine-grained" land use (and street) pattern--where land uses and activities are contained in a small area--will make more home-based trips, and will make greater use of non-auto travel modes as compared with demographically similar households residing in communities with a more homogenous urban land use pattern.

Key Words: urban land use, travel behavior

Papers to date:

None

Conferences Attended:

None to date.

Other Accomplishments:

None to date.

Percent Complete:

75%

Direct Cost:

\$10,704

Estimation of Latent Pavement Properties Using Condition Survey Data

Principal Investigator:

Samer M. Madanat
Civil and Environmental Engineering
UC Berkeley CA 94720-1720
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Abstract:

The availability of high-speed sensors for pavement inspection makes it possible to infer the causes of observed pavement deterioration. The simultaneous measurement of multiple pavement distresses can provide sufficient information to statistically estimate underlying pavement properties such as moduli. By inferring the values of the such variables in-situ, pavement engineers can use them for purposes of deterioration prediction. Furthermore, inferring the causes of the observed deterioration allows pavement engineers to select more effective maintenance strategies. The objective of this research is to use a latent variable model framework for the estimation of underlying pavement properties, using data from condition surveys. **Key Words:** pavement, deterioration, condition surveys, pavement distresses

Work Completed to Date:

Papers to date:

None

Conferences Attended:

None to date.

Other Accomplishments:

None to date

Percent Complete:

90%

Direct Cost:

\$42,223

Putting Behavior in Household Travel Behavior Data: An Interactive GIS-based Survey Via the Internet

Principal Investigator:

Michael G. McNally
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Irvine, CA 92697-3600
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mmcnally@uci.edu

Abstract:

A previous research project produced a prototype of REACT!, a web-based, self-administered survey instrument for collecting household travel/activity data (see <http://www.its.uci.edu/react/>). In this follow-on study, a beta test of REACT! is being performed followed by a formal field study where 47 households used REACT! to provide 24 hours of travel/activity data over a seven day period. **Key Words:** travel behavior, activity diaries, internet, GIS

Work Completed to Date:

REACT! was run locally on the respondent's PC and data was transmitted via the internet to a server in ITS-Irvine where the survey process was monitored by project GSRs. REACT! documents not only the resultant behavior but also the scheduling process that produces that behavior by having respondents record activities as they are initially planned, updated, and executed. Formal analysis is currently underway. Preliminary results include the identification of distinct spatial and temporal behaviors for planned and unplanned activities. Classification and structural equation models are being developed to identify regularities in scheduling behavior.

In spring 2001, a modified version of REACT! survey is being applied to study changes in travel patterns when shared-used electric vehicles are provided as "fleet cars" for selected companies in southern California.

Papers to date:

- Lee, M-S (2001). "Experiments with A Computerized Self-Administered Activity Survey: Evaluation of a Pilot Study", PhD dissertation, Department of Civil and Environmental Engineering, University of California, Irvine, March 2001.
- Lee, M-S and McNally, MG (2001). "Experimenting with A Computerized Self-Administered Activity Survey: Evaluating a Pilot Study", Transportation Research Record, (forthcoming).
- Kulkarni, AA and McNally, MG (2000) "A Microsimulation of Daily Activity Patterns", presented at the 80th Annual Meeting of the Transportation Research Board, Washington, DC.
- Lee, MS, Doherty, ST, Rindt, CR, and McNally, MG (2000) "Extending the Scope of Computerized Household Activity Scheduling Surveys", presented at the 9th International Association of Travel Behavior Conference, Gold Coast, Queensland, Australia.
- Kulkarni, AA and McNally, MG (2000) "An Activity-based Microsimulation Model for Generating Synthetic Activity-Travel Patterns: Initial Results," presented at the 9th International Association of Travel Behavior Conference, Gold Coast, Queensland, Australia.
- Marca, JE, Rindt, CR, and McNally, MG (2000) "A Latent Factor Model of Observed Traveler Activity Sequences", presented at the 9th International Association of Travel Behavior Conference, Gold Coast, Queensland, Australia.
- Kulkarni, AA and McNally, MG (2000) "An Activity-based Travel Pattern Generation Model", presented at the 39th Annual Meeting of the Western Regional Science Association, Kauai, Hawaii, February 2000
- Lee, MS, Doherty, ST, Sabetiashraf, R, and McNally, MG (2000). "iCHASE: An Internet Computerized Household Activity Scheduling Survey", presented at the 79th Annual Meeting of the Transportation Research Board, Washington, DC.
- Marca, JE, Rindt, CR, and McNally, MG (2000). "A Simulation Framework and Environment for Activity-based Transportation Modeling", presented at the 79th Annual Meeting of the Transportation Research Board, Washington, DC.

Conferences Attended:

- 79th Annual Meeting of the Transportation Research Board, Washington, DC, Jan 2000.
- 9th International Association of Travel Behavior Conference, Queensland, Australia, July 2000.
- 39th Annual Meeting of the Western Regional Science Association, Kauai, Hawaii, Feb 2000

Other Accomplishments:

REACT!, web-based software with integrated GIS for Computer-Assisted Self-Administered Interviews (CASI) for the study of household travel-activity scheduling behavior and the collection of travel, activity, and time use diaries (see: <http://www.its.uci.edu/react/>)

Percent Complete:

95%

Direct Cost:

\$76,833

Measuring the Role of Transportation in Facilitating the Welfare-to-Work Transition (Year 2)

Principal Investigator:

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Other Key Participants:

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Brian Taylor
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Abstract:

Anecdotal evidence and preliminary research suggest that transportation services are crucial to helping welfare recipients transition into the labor market; however, empirical research on the relationship between transportation and welfare use is limited. Also, welfare reform since 1996 is creating new conditions that are altering that relationship. To fill the research gap, we use administrative data on the geographic distribution of jobs in low wage firms and measures of access to transportation. This study analyzes employment outcomes as a function of population and labor market characteristics and access to employment, including access to transportation and proximity to licensed child care centers. **Key Words:** Welfare-to-work, case studies (California), transit and employment

Work Completed To Date:

With a previous grant, agreements with the State of California and the County of Los Angeles established a secured data facility allowing construction of baseline data for Los Angeles, including measures of job access incorporating travel time by public transit and private car. In the current grant we are updating the Los Angeles data, analyzing the role of transit access on early employment outcomes in Los Angeles, and constructing a baseline data for Alameda County, California. We have modified our schedule in accordance to how quickly we are able to enter into a cooperative agreement with counties. We have reached such an agreement with Fresno County. CA's Board of Supervisors, so we have increased our activities there. Given our limited resources, this change has required us to decrease our activities in Alameda County, CA, although we continue to work there. Significant milestones include gaining access to a survey of recipients in Alameda County to analyze the relationship between access to cars and employment, and to analyze other transportation issues facing this population. We are in the process of analyzing access to transportation. .

Papers to date:

-Evelyn Blumenberg and Paul Ong, "Cars, Buses and Jobs: Welfare Recipients and Employment Access in Los Angeles," TRB Record, accepted for publication.

-Paul Ong, "Car Ownership and Welfare-to-Work," unpublished paper under review, February 26, 2001.

-Paul Ong and Douglas Houston, "Transit and Autoless Welfare Recipients," unpublished paper under review, November 2000.

-Douglas Houston and Paul Ong, "Childcare Availability and Usage among Welfare Recipients," unpublished paper under review, February 2001.

-Paul Ong, Douglas Houston, John Horton, and Linda Shaw, "Los Angeles County CalWORKs Transportation Needs Assessment Report," in preparation, February 2001.

Conferences Attended:

-Association of Collegiate Schools of Planning Conference, Atlanta, Ga., November 2000. Paper presented: "Planning for the Transportation Needs of Welfare Recipients: Barriers to Interagency Collaboration."
-Transportation Research Board Conference, Washington, D.C., January 2001. Paper presented: "Cars, Buses and Jobs: Welfare Recipients and Employment Access in Los Angeles."

Other Accomplishments:

None to date.

Percent Complete:

75%

Direct Cost:

\$34,823

Development of Estimation Procedures for Activity-Based Model Forecasting

Principal Investigator:

Wilfred W. Recker
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University of California, Irvine
949-824-5642
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Abstract:

The activity-based modeling framework offers an analytical option for estimating the relative importance of factors associated with the spatial and temporal interrelationships among the out-of-home activities that motivate household's needs or desire to travel. Demand estimation within the activity-based modeling framework is seen to provide both necessary constraint considerations on the household's decision alternatives within a utility-maximizing structure and a convenient mechanisms for generating the set of feasible alternatives that are likely to be considered. This study is based on previous activity-based research conducted by the principal investigator and his colleagues, and will be directed toward developing a practical estimation procedure to enable the use of a mathematical programming activity-based model as a demand forecasting tool. **Key words:** travel demand forecasting, activity-based modeling

Work Completed to Date:

Dataset comprising all members of all households within the Portland activity survey with complete information has been constructed. The dataset is in the form of the required input to the HAPP model, i.e., activity profiles and temporal and spatial constraints. Contingency matrices based on probability distributions of pertinent decision variables contained in the model have been constructed. An algorithm for estimating a distance measure based on the sequence alignment method for comparison of model output to revealed activity patterns has been constructed.

Papers to Date:

Recker, W.W. (2000). A Bridge between Travel Demand Modeling and Activity-based Travel Analysis. Transportation Research , Part B: Methodological (forthcoming).

Conferences Attended:

None to date

Other Accomplishments:

None to date

Percent Complete:

70%

Direct Cost:

\$38,735

Online Versus Rolling Horizon Algorithms for Dynamic Service Fleet Operations

Principal Investigators:

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Abstract:

Online algorithms, in which data is supplied to the algorithm incrementally and in which responses to the data are developed and implemented incrementally are of significant interest to the computer science community in general, and there has been recent interest in applying these techniques to the analysis of dynamic transportation problems. The most natural application of this work is to dynamic commercial vehicle operations. This research compares the performance of rolling horizon optimization algorithms (i.e. stochastic programming) to classical online approaches which react to current information but do not make probabilistic assumptions about the future. In addition, we develop algorithms which combine the benefits of these approaches but--like the online algorithms--are suitable for real time implementation. Where appropriate, we apply the technique of competitive analysis to algorithms for the service fleet operations. **Key words:** commercial vehicle operations, service fleet operations, urban goods movement, dynamic fleet management, online algorithms, competitive analysis

Work to Date:

We examined on-line versions of variants of the traveling salesman problem (the Dynamic Traveling Salesman Problem, the Dynamic Traveling Repair Problem, the Probabilistic Traveling Salesman Problem). We obtained nice results for the PTSP the DTRP and the DTSP.

Papers to Date:

- Lu, X. A.C. Regan and S. Irani (2001), Dynamic and Stochastic Fleet and Freight Management: Algorithm Development and Performance Analysis, Proceedings of the 2001 TRISTAN Conference, San Pablo, June.
- Lu, X, S Irani and A.C. Regan (2001) The Dynamic Traveling Salesman Problem: An examination of alternative heuristics, *Transportation Science*, under review.
- Lu, X., A.C. Regan and S. Irani (2001), The M/G/1 queue with Switching Costs: An examination of alternative heuristics, *Queueing Systems*, under review.
- Lu, X, A.C. Regan and S. Irani (2001) An Asymptotically Optimal Algorithm for the Dynamic Traveling Repair Problem, in preparation for second submission to *Transportation Science*.
- Irani, S, X. Lu and A.C. Regan (2001), Competitive analysis of algorithms for the Dynamic Traveling Salesman Problem, in preparation for submission to the 2001 meeting of the Symposium on Discrete Algorithms.
- Lu, X, S., S Irani and A.C. Regan (2001) An Algorithm for the Probabilistic Traveling Salesman Problem, in preparation for submission to Operations Research Letters.

Conferences Attended:

INFORMS
TRB Annual Meeting, Jan. 2001

Other Accomplishments:

Xiangwen Lu will defend his dissertation in September, 2001.

Percent Complete:

100%

Direct Cost:

\$33,157

Evaluating a University Transit Pass Program

Principal Investigator:

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Abstract:

Some universities in the U.S. have devised a new way to finance public transit services for their communities. They contract with local transit operators to allow students, staff, and faculty use of public transit free of charge when they display a university photo-ID card. We will 1) survey universities providing fare-free transit passes for university students and personnel, 2) explore the potential for extending these programs to non-university settings, and 3) analyze the theoretical rationale for providing such programs to a defined population. **Key words:** public transit, fare-free transit, university transit

Work Completed to Date:

UCLA's pilot transit-pass program began in September 2000, and we are analyzing the data for the project. We have done a considerable amount of preparation for the evaluation, however, and the pilot program has been extended through May 2001-2002. We will analyze the data from the boardings to evaluate the cost-effectiveness of the program in reducing vehicle trips and parking demand on campus. We have collected comments from 1,600 users to help in our evaluation.

Papers to Date:

"Unlimited Access," forthcoming in *Transportation*

Conferences Attended:

Transportation and University Communities Conference Gainesville, Florida, April 1-4 2000
Transportation Research Board, Washington, DC, January 2001
American Collegiate Schools of Planning Conference, Atlanta, GA, November 2000

Other Accomplishments:

The main accomplishment was to inaugurate the transit-pass program at UCLA. All UCLA students, staff, and faculty can use their UCLA ID cards as a transit pass on the Santa Monica Municipal Bus Lines.

Percent Complete:

70%

Direct Cost:

\$34,965

Journeys to Crime: Documentation and Evaluation of Crime Incidence on and around Railway Stations in Los Angeles

Principal Investigators”

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Robin Liggett, Department of Urban Planning and Department of Architecture/Urban Design
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Abstract:

The widespread perception that rapid transit brings increased crime to the areas it serves is a problem for the planning and implementation of new transit system stations. Evidence from Los Angeles indicates fear of crime is one of three reasons cited for non-use of transit stations. Most research on transit crime has focused on heavy rail systems and has examined the underground station environment. There is limited and inconclusive research on crime on and around surface and above-ground stations and very limited understanding of the "journey-to-crime" of potential offenders; we also do not clearly understand how new transit lines affect outlying suburban areas, and how surrounding environments affect station security. While we understand how certain design elements can mitigate crime in underground stations we are not very clear as to which of these elements are relevant for light rail stations. This study will examine the incidence of crime on the Green Line metro stations in Los Angeles to investigate how the introduction of this line has affected crime occurrence in the surrounding communities and how, in turn, characteristics of the immediate station neighborhood affect crime on the station. Using crime statistics, interviews, ridership and environmental data, we will document and evaluate 1) spatial and temporal distribution of crime along the metro line; 2) the impact of socio-demographic and environmental attributes on crime occurrence; 3) the possibility of crime dislocation; and 4) the possibility of transit-related crime in outlying areas. **Key Words:** transit related crime, metro crime

Work Completed to Date:

We first carried out a literature review, then collected and processed ridership and crime data for all Green Line stations, as well as crime data for Los Angeles County and City and for other cities adjacent to the Green Line. We processed and geocoded these data and compiled GIS data and maps. We also compiled census information, land use and environmental data for ½ mi. radius around each station and completed photographic documentation of the 14 stations and station neighborhoods. We interviewed the captain of the transit division of the Los Angeles Sheriff's Department and MTA officials responsible for security. We now are completing the analysis of all fieldwork and socio-demographic data and crime statistics.

Papers to Date:

Draft report.

Conferences Attended:

None to date.

Other Accomplishments:

None to date

Percent Complete:

90%

Direct Cost:

\$49,775

The Viability of Value Pricing Demonstrations

Principal Investigator:

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Abstract:

Recently, the transportation policy community has turned to small-scale demonstration projects to test and publicize road pricing. Short-term demonstrations were carried out in Stuttgart, Germany and Bristol, England, while potentially permanent projects now operate in Orange County, (California), San Diego (California), and Houston (Texas). The latter three make use of value pricing, in which travelers can choose between free and priced roadways. Recent research, however, has uncovered a problem for such demonstrations: minimizing aggregate travel-delay costs on two parallel roadways- when one must be free--may call for tolls on the express roadways that are far lower than those now charged. In simulation studies, value pricing is sometimes worse than no pricing at all. **Key words:** value-pricing, road pricing, value of time, demonstration projects, second-best pricing

Work Completed to Date:

The simulation work is complete, and has led to a paper that was presented in many venues and has been published in *Journal of Urban Economics*. This work was very successful in explaining how the desirability of road-pricing demonstration projects using "value pricing" depends critically on differences in the value different people place on time savings. The alternative simulation model using a continuous value of time has also been completed, leading to a working paper. The portion of the research involving empirical measurement of variation in value of time has not been completed, because the Brookings Institution project in which the data was being collected was delayed. This was due to problems getting an adequate response rate. Those data were finally received in November 2000. We also processed data from field measurements of travel-time savings achieved by using the SR91 toll road on selected days during which the Brookings data were collected. The field measurements provide information about typical time savings as well as the reliability of travel time on the unpriced portion of SR91. We have constructed several measures of these quantities and have merged them with the Brookings survey data. Preliminary estimation of demand models to derive value of time has begun.

Papers to Date:

- Small, Kenneth A., and Jia Yan, "The Value of 'Value Pricing' of Roads: Second-Best Pricing and Product Differentiation", *Journal of Urban Economics*, vol. 49 (2001), pp. 310-336.
- Verhoef, Erik T., and Kenneth A. Small, "Product Differentiation on Roads: Constrained Congestion Pricing with Heterogeneous Users", working paper, Dept. of Economics, UC Irvine (revised June 2000).
- Small, Kenneth A., "The Value of 'Value Pricing'", Access (forthcoming 2001).

Conferences Attended:

- Transportation Research Board, Washington, DC, Jan. 2000.
- Workshop on The Politics of Pricing, Govt. Institute for Econ. Research, Helsinki, Finland, Aug. 1999.
- Tinbergen Institute (Amsterdam), May 2000.
- Katholieke Universiteit, Leuven (Belgium), May 2000.

Other Accomplishments:

None to date

Percent Complete:

95%

Direct Cost:

\$32,932

Greenhouse Gas Emissions Trading and the Transport Sector

Principal Investigator:

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Abstract:

Climate change has become an internationally recognized environmental issue. Transportation contributes about 25% of greenhouse gas emissions in the U.S. International negotiations to reduce greenhouse gas emissions have foundered in part over debates over the role of emissions trading. So far, no reports or papers addressing emissions trading issues have addressed the transport sector in a comprehensive fashion. Emissions trading schemes provide the potential for large emission reductions at low cost and may be more politically acceptable than tax and command-and-control approaches. But the diffuse nature of emission sources and other unique attributes of the transport sector create special challenges and opportunities for study. **Key words:** greenhouse gas, climate change, emissions trading, marketable permit

Work Completed to Date:

An extensive literature review of emissions trading schemes and experiences has been completed. We are now nearing completion of a draft report on developing baseline methodologies. This effort is being conducted in coordination with the International Energy Agency, which will play a central role in designing and overseeing an international emissions trading scheme. In this initial report, we are focusing on the difficult problem of determining what are the appropriate baselines to be using creating emission trading programs. Transportation is perceived as the most difficult sector to deal with in this regard. This baseline methodology will be used in determining what emissions can be treated as credits and therefore be eligible for trading.

Papers to date:

D. Sperling, "Toward Effective Transportation Policy," Innovative Policy Solutions to Global Climate Change, Pew Center on Global Climate Change and Royal Institute of International Affairs, Washington, D.C., 26 April 2000.

Conferences Attended:

- Energy Roundtable, Aspen, Colorado, September 28, 2000 (invited, evening keynote)
- Toward a Greener Road Vehicle: Innovation Paths for Sustainability, Workshop at Aston University, Aston Business School, June 29-30, 2000 (kick-off presentation) (invited)
- Innovative Policy Solutions to Global Climate Change, Pew Center on Global Climate Change and Royal Institute of International Affairs, Washington, D.C., 26 April 2000 (invited)
- Transportation Research Board, Annual Meeting, January 11, 2000
- Energy Roundtable, Cambridge, England

Other Accomplishments:

Deborah Salon (grad student on project) was invited to spend 3 months at the International Energy Agency in Paris to develop a strategy for developing baselines to use for transportation emissions trading (internationally).

Percent Complete:

70%

Direct Cost:

\$53,034

Driving for Dollars: How the Politics of Finance Has Shaped the California Highway System

Principal Investigator:

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Abstract:

A clear understanding of how the politics of public finance has shaped the development of transportation systems is crucial if we are to effectively manage and develop transportation infrastructure in the future. This research relies on a combination of historical, quantitative, and qualitative methods to explore three questions: 1) why did California embrace a user-fee-based transportation system in the 1920s, and why the recent shift to non-user-based finance instruments?; 2) why has California been unable to adopt an effective, equitable system of heavy vehicle fees?; and 3) why are current urban freeway systems so different than the early plans for cities? **Key words:** freeway planning, transportation planning, public finance of transportation, transportation system development, transportation planning policy

Work Completed to Date:

Doctoral student Jeffrey Brown has continued to review the transportation plans prepared for major U.S. metropolitan areas and has conducted an extensive investigation of the secondary and tertiary source literature on metropolitan transportation planning and engineering from 1900 to 1950. Mr. Brown is preparing two papers that document some of this research to-date, including an overview of the evolution of the urban freeway as seen through the contrasting planning activities and visions of Robert Moses and Harland Bartholomew, and an in-depth analysis of the efforts of early transportation planners and engineers to develop a "science" of urban transportation planning based on rational, empirical methods. Given our current progress with this work, we still to have the manuscript completed for review by the end of the 2001 calendar year.

Papers to date:

"The Evolution of Statewide Transportation Planning in California," paper presented at the California Transportation Futures Symposium in Sacramento, California on 1 December 2000.

Conferences Attended:

California Transportation Futures Symposium, Sacramento, CA: Nov/Dec 2000

Other Accomplishments:

None to date

Percent Complete:

85%

Direct Cost:

\$24,589

Regional Transportation Infrastructure Finance in the U.S.

Principal Investigator:

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Abstract:

This study examines the extent to which states have devolved one of the most fundamental decisions in transportation policy -- whether to use taxation powers to fund transportation improvements -- to local and regional governments. The purpose of the study is to generate a baseline of knowledge on "local option transportation taxes" in all fifty states, including the relevant legislative authority for these taxes, the extent to which local areas have adopted them, and the roles they play within their states' overall transportation finance frameworks. **Key words:** regional transportation, transportation finance, local option taxes

Work to Date:

Our work is complete. A final report has been written and is available on the web as well as in hard copy. The report is in two volumes.

Papers to date:

-Todd Goldman, Sam Corbett, and Martin Wachs. Local Option Transportation Taxes in the United States, Part I: Issues and Trends. Report UCB-ITS-RR-2001-3, March 2001.
-Todd Goldman, Sam Corbett and Martin Wachs. Local Option Transportation Taxes in the United States, Part II: State-by-State Findings. Report UCB-ITS-RR-2001-4, March 2001.

Conferences Attended:

None.

Other Accomplishments:

None

Percent Complete:

100%

Direct Cost:

\$30,183

Estimating Freeway Traffic Stream Modal Activities for Air Quality Modeling

Principal Investigator:

H. Michael Zhang
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Abstract:

The research will develop a method that uses data provided by widely deployed point sensors, namely inductive loop detectors, to construct vehicle trajectories of freeway traffic, from which modal activities of traffic streams can be estimated. This method provides a cost-effective way to develop freeway driving cycles used in air quality models and emission adjustment factors for freeways whose traffic flow patterns largely differ from those embodied in the driving cycles, thereby improving the accuracy of emission estimates by those models. It also produces “the ground truth” for calibrating transportation planning models when accurate speed estimates are desired. **Key Words:** loop detectors, traffic streams, air quality models, velocity field

Research Completed To Date:

Preliminary work has been completed on (a) the generation of velocity field on dense time-space grids, (b) the construction of vehicle trajectories from velocity fields

Papers to Date:

Michael Zhang and Bo Wang (2001) “Construction of vehicle trajectories from loop data,” ITS-Davis Project Report.

Conferences Attended:

None to date.

Other Accomplishments:

A master’s thesis based on this work is completed.

Percent Complete:

95%

Direct Cost:

\$10,000

2000-2001 Projects (Year 13)

Stationary Traffic Models and Freeway Geometry

Principal Investigator:

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Abstract:

The research is examining how relations between freeway traffic variables, namely flow and occupancy, are influenced by the segment's number of lanes. The traffic measurements are jointly extracted from prolonged periods marked by nearly stationary conditions. In this way, bivariate plots of the data exhibit relatively little scatter; i.e., the relational forms are readily determined from visual inspections. Moreover, the data are measured by loop detectors on neighboring freeway segments that differ only in their number of travel lanes. In this way, virtually all influences, save the number of lanes, are held fixed so that the affects of the number of lanes are apparent by comparing the relations measured on each neighboring segment. **Key Words:** travel lanes, stationary travel models, flow, occupancy

Work Completed to Date:

We have performed the above experiments using data from neighboring freeway segments in 1) Hayward, CA; 2) Los Angeles, CA; 3) St. Paul, MN, and 4) Toronto, Canada. The findings to date clearly show that the number of lanes influence the shapes of the relations. Most notably, average vehicle speeds are less sensitive to increasing flows as the number of lanes (and thus the opportunity to over-take slower-moving vehicles) increases.

Papers to Date:

None

Conferences Attended:

None yet

Other Accomplishments:

None yet

Percent Complete:

70%

Direct Cost:

\$40,190

Does Commuting Distance Matter? Commuting Tolerance and Residential Change

Principal Investigator:

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Abstract :

Do individuals and households (two workers) minimize commuting distances when they change residences? What is the nature of the commuting threshold in polycentric cities? These questions are a central part of our continuing attempts to understand the trade-off between commuting and housing locational choices. To examine these questions we use a probability model to assess the likelihood of increasing or decreasing commute distance (and time) with relocation within the urban area. Although studies of migration have often linked job changes and inter-state moves, there are few studies that examine the changing interaction of residence and workplace. Yet, it is just such changes that have implications for local transportation policy and planning. The study will provide answers to the question of how sensitive households are to commute distance and the separation of residence and workplace. **Key Words:** residence location, workplace location, commuting, longitudinal data, commuting threshold

Work Completed to Date:

Research on commuting distances has been completed, a formal model of the probability of moving closer to work place with a change in residence has been constructed and two papers have been presented at conferences (see below). Currently research on commuting and the location of workplace concentration has been completed and is being written up.

Papers to Date:

W.A.V. Clark, Youqin Huang and Suzanne Withers, Does Commuting Distance Matter? Commuting Tolerance And Residential Change, Submitted to Regional Science and Urban Economics.

Conferences Attended:

- William A.V. Clark, Youqin Huang and Suzanne Withers, Does Commuting Distance Matter? Commuting Tolerance And Residential Change, Presented at the Western Regional Science Meetings in Palm Springs February, 2001.
- Suzanne Withers and William A. V. Clark An Analysis Of The Spatial And Temporal Interdependencies Of Dual Earner Households Presented at the Association of American Geographers Annual Meetings, New York, March, 2001.
- William A.V. Clark, Growth and the Quality of Life, 10th Annual UCLA Policy Research Symposium, Lake Arrowhead, October, 2000.

Other Accomplishments:

None to date

Percent Complete:

70 %

Direct Cost:

\$38,791

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

Principal Investigators:

Thomas F. Golob	Amelia C. Regan
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Abstract:

A substantial portion of all business-to-business transactions in the U.S. now occurs online or electronically, over private specialized networks using EDI (electronic data interchange) and over the Internet. Such business-to-business "e-commerce" is expected to increase dramatically, particularly the share that occurs on the Internet. Online activities include, but are not limited to, issuing catalogs, quotes and schedules, placing orders and bids, and consolidating, scheduling, and tracking shipments. While e-commerce is increasing productivity, it is not known how it is affecting freight transportation, and particularly urban goods movement. We are studying the impact of e-commerce and related information technology on shippers, carriers, and third party logistics and information providers by analyzing data from three new closely related and simultaneously implemented Internet-based (online) industry surveys. The Internet surveys will be used to gather industry representatives' perceptions of e-commerce impacts on freight demand by mode and by the size and timing of shipments. The surveys will also explore which aspects of e-commerce can be most effective in alleviating congestion on the freight network. These data will be analyzed using discrete choice models and multivariate statistical methods to describe technology adoption and to allow forecasting of e-commerce effects on freight demand patterns. **Key Words:** internet, e-commerce, freight transportation, urban goods movement, information technology

Work Completed to Date:

We have conducted a literature review, launched two surveys (one of carriers, the other of 3PLS).

Papers to Date:

- Golob, T.F. and A.C. Regan (2001), Impacts of Information Technology on Personal Travel and Commercial Vehicle Operations: Research Challenges and Opportunities, *Trans.Res. C*, 9, pp. 87-121.
- Regan A.C. and R. Garrido (2001), Freight Demand and Shipper Behavior Modeling: State of the Art, Directions for the Future, in Hensher, D.A. and King, J. (eds) *The Leading Edge of Travel Behavior Research*, Pergamon Press, Oxford, in press.
- Regan, A.C. and J. Song (2001), Freight Transportation Intermediaries in an Information Age, *Transportation Journal*, under review.
- Forster, P. and A.C. Regan (2001) Information Technology in Air Cargo: Interorganizational Systems and On-Time Performance, *Transportation Journal*, under review.
- Regan, A.C. and J. Song (2001) Transition or Transformation? Emerging Freight Transportation Intermediaries, *Transportation Research Record*, in press.

Conferences attended:

TRB annual meeting, 2001,
Invited lecture, USC (J. Song)

Other accomplishments:

None to date.

Percent complete:

90%.

Direct Cost:

\$52,673

Assessing the Influence of Residential Location Changes on Travel Behavior

Principal Investigator:

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Abstract:

When a household relocates, what are the immediate and longer-term impacts on travel behavior? How do household travel patterns evolve? This project proposes to use technologies developed in prior UCTC, PATH, and Testbed research projects to facilitate the observation of a small number of households re-locating from other areas in Orange County, CA to selected new home developments in Irvine. We will install TRACER System in-vehicle GPS/Wireless Communication units in all household vehicles to measure specific vehicle use for a multi-day period prior to moving, upon relocating, and a few months after relocating residences. We will also have the sampled households use REACT!, a Computer-Aided Self-administered Interview package (which was developed in prior UCTC research) to record the household activity scheduling process during this same period. We will utilize GIS-based data sets depicting both the local activity-systems and transport networks. Together, these data will enable us to address the immediate changes in travel behavior upon relocation, and to assess the evolution of stability in this behavior over time. **Key Words:** household relocation, travel patterns, GIS, GPS, travel behavior

Work Completed to Date:

Tasks completed include a literature review, a survey of new housing developments to aid in selection of study focus areas, preliminary negotiations with developers for access to new-home buyers, submittal of human subject review protocols, and preliminary modification of REACT! software to reflect project specific question areas.

Papers to Date:

None

Conferences Attended:

None to date

Other Accomplishments:

None to date

Percent Complete:

50%

Direct Cost:

\$51,980

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

Principal Investigator:

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Other Key Participants:

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Abstract:

Various explanations have been given for the failure of policies designed to alleviate congestion. We believe that insufficient attention has been paid to travel-related attitudes and predispositions. This study empirically examines the role of travel-related attitudes in an individual's consideration and adoption of various strategies in response to congestion. We hypothesize that people who have an intrinsic desire for mobility, and those who are currently mobility-deprived are less likely to adopt travel-reducing strategies (such as telecommuting, changing to a compressed work week) or major lifestyle changes (job or residential relocation, quitting work). We also hypothesize that the mobility-deprived are more likely to adopt coping strategies that enable them to maintain or increase their travel (such as getting a mobile phone or a more comfortable car, changing work trip departure time). We will examine the effect of previous adoption of various strategies on the consideration of additional responses, and the demographic distribution of the adoption and consideration of the strategies studied. **Key Words:** attitudes, desired mobility, congestion, behavioral response

Work Completed to Date:

Data cleaning has been completed, and statistical analysis has begun. We are analyzing differences in the adoption of various strategies by demographic, attitudinal, and other characteristics. In parallel, we have conducted factor analysis on the patterns of adoption of the strategies, to provide input into the formation of bundles of strategies that appear to be similar. After the bundles are finalized, we will analyse the adoption of bundles (e.g. testing the hypothesis of sequential adoption of ever-more-costly bundles), and ultimately develop models.

Papers to date:

None

Conferences Attended:

None to date

Other Accomplishments:

None to date

Percent Complete:

50%

Direct Cost:

\$52, 782

Measuring the Role of Transportation in Facilitating the Welfare-to-Work Transition (Year 3)

Principal Investigator:

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Other Key Participants:

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Abstract:

This is the third and final project in our assessment of the role of transportation in facilitating welfare-to-work in Los Angeles, Fresno, and Alameda Counties. The study will go beyond the role of personal characteristics (e.g., education, age) and examine how transportation can enhance or hinder access to jobs and childcare. The three counties provide us with a valuable comparison of two different major urban areas and one agricultural-based area.

Key Words: welfare-to-work, job access, childcare access

Work Completed to Date:

We have received and processed the following at the state level: 1) the welfare and employment histories (1993 to 1998) of millions of recipients, 2) 1998 information on nearly a million private-sector establishments, and 3) detailed 1998 audit data on several thousand recipients. For Los Angeles, we have: 1) assembled an extensive inventory of the public transportation system, 2) received and analyzed data on 1998 child-care providers, 3) conducted (with other agencies) a 1999-2000 survey of the transportation patterns and needs of 1,600 recipients, and 4) surveyed in 1999-2000 over 200 firms hiring recipients. For Alameda, we are working with the Public Health Institute to analyze the transportation questions in the Institute's survey of recipients in that county. For Fresno, we have received approval from the Board of Supervisors to access and use the county's administrative files, and we are planning to secure some survey-based data for recipients. Significant milestones include gaining access to a survey of recipients in Alameda County, California, to analyze the relationship between access to cars and employment, and to analyze other transportation issues facing this population. We are in the process of analyzing access to transportation. We also have agreements from the Board of Supervisors to do an analysis in Fresno County, CA

Papers to date:

None

Conferences Attended:

None to date

Other Accomplishments:

None to date

Percent Complete:

50%

Direct Cost:

\$44,724

Systematic Transport Access and Policies for Low Wage Labor Markets

Principal Investigator:

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Harry J. Holzer
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Abstract:

This research helps to understand the linkages between spatial access and labor market outcomes for low-wage workers, especially teenagers, minorities, and welfare recipients. The work includes: (1) an analysis of the effect of transport improvements upon minority employment, (2) an analysis of spatial isolation and teenage employment, (3) an investigation into whether auto access “causes” higher levels of employment.

The research provides insights on the role of transportation in supporting the employment of low income, minorities, welfare recipients, and teenagers. **Key Words:** spatial access, labor market outcomes, low-wage workers

Work Completed to Date: A paper has been written on the effect of transport improvements upon minority employment. Additional research is underway on teenage employment issues and on the effects of auto ownership on employment.

Papers to date:

"Public Transit and the Spatial Distribution of Minority Employment: Evidence from a Natural Experiment," Working Paper WP01-005, Berkeley Program on Housing and Urban Policy, University of California, Berkeley, 2001.

Other Accomplishments:

Paper invited for presentation at the 40th Annual Meetings of the Western Regional Science Association, Palm Desert, CA, February, 2001.

Percent Complete:

80%

Direct Cost:

\$30,000

Activity-Based Forecasting Model for Planning Applications

Principal Investigator:

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Abstract:

In this research, we seek to complete the activity-based modeling framework that has evolved over past research efforts by extending it to a “traditional” planning framework. Specifically, we will couch the activity-based approach in terms that provide output consistent with accepted trip-based static planning methodologies as well as full estimates of the associated dynamics of trip generation, distribution and route selection. The work will derive from a theoretically consistent paradigm based on the need/desire of households to interact with their environment. We will show that the particular mathematical programming paradigm can be used to describe the demand modeling processes both for conventional trip-based travel demand and for activity-based approaches. **Key Words:** activity-based model, travel demand forecasting, mathematical programming

Work Completed to Date:

Work completed to date includes: 1) The development of all of the necessary activity files from the Portland data set that serve as input to the Household Activity Pattern Problem (HAPP) model; 2) The development of measurement algorithms to assess the error between the observed and predicted activity patterns, and 3) The development of the general schematic that will be used in the estimation process.

Papers to Date:

None.

Conferences Attended:

None to date.

Other Accomplishments:

None to date.

Percent Complete:

70%.

Direct Cost:

\$53,531.

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

Principal Investigators:

Amelia Regan	Charles Lave	Amihai Glazer
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Abstract:

The basic modeling of freight transportation was done thirty years ago. Since then, new institutional entities have emerged -- the third party logistics provider -- performing new kinds of information and coordination services to meet the new needs created by just-in-time manufacturing, distribution systems and visible supply chains. We propose to revisit basic inventory theoretic freight demand models with the aim of developing new models which explicitly uncouple order processing time from transportation time, and which incorporate several new modes choice characteristics -- visibility, control, and trust -- into the mode selection step. Our objective is to develop new freight demand models that uncouple order processing time from transportation time, and otherwise update the models to accommodate new institutional entities that have developed since the creation of the original models. We will re-examine basic inventory freight demand models and update them, incorporating several new mode choice characteristics, as well as explicitly uncouple order processing time from transportation time. The work will result in the creation of models that better take into account the new needs and providers that have developed in response to just-in-time manufacturing, distribution systems, and visible supply chains. **Key Words:** freight transportation, freight demand models, visible supply chains

Work Completed to Date:

This seed project began in April of 2001 and will be completed in fall 2001.

Papers to Date:

None

Conferences Attended:

None to date

Other Accomplishments:

None to date

Percent complete:

70%.

Direct Cost:

\$15,687

Has Parking Cash Out Failed in California?

Principal Investigator:

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Abstract:

In 1992, California enacted a parking cash-out requirement to reduce the traffic congestion and air pollution. The law requires employers to offer commuters the option to take the cash value of free parking at work if they do not take the free parking itself. Poor enforcement of the cash-out law has given many people the impression that parking cashout does not work. However, one city in California -Santa Monica- requires all employers in its jurisdiction to comply with the state's cash-out requirement. Twenty-six employers in Santa Monica have established parking cash-out programs for their employees. This municipal island of compliance with the state's cash-out law presents a unique opportunity for research. In this study I will examine how Santa Monica has obtained employers' compliance with California's cash-out law, and to estimate what the effects of compliance have been. Specifically, I will examine (1) how Santa Monica has enforced the state's parking cash-out law for employers in its jurisdiction, (2) how compliance with the law has reduced vehicle travel and vehicle emissions, (3) how the regulated employers in Santa Monica describe their experience with parking cash out, and (4) the statewide effects on vehicle travel and vehicle emissions if employers in all jurisdictions complied with California's parking cash-out law. **Key Words:** parking cashout, vehicle travel, emissions

Work Completed to Date:

We have (1) interviewed the city officials who administer the program, (2) assembled the sample of employers who offer parking cash out programs in Santa Monica, and (3) devised the interview questions. We are currently obtaining other needed data.

Papers to date:

"Parking Cash Out" prepared for the European Conference of Ministers of Transport, for a roundtable in Paris in Fall 2001.

Conferences Attended:

Transportation Research Board, Washington, DC, January 2001
American Collegiate Schools of Planning Conference, Atlanta, GA, November 2000

Other Accomplishments:

I have also been in contact with the California Air Resources Board. They are taking steps to advertise the law, announce it on their web site, and to work with the AQMDs to encourage compliance.

Percent Complete:

70%

Direct Cost:

\$42,145

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

Principal Investigator:

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Other Key Participants:

Robin Liggett
Department of Urban Planning
School of Public Policy and Social Research
and Department of Architecture
School of Fine Arts and Architecture
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Abstract :

This study is an in-depth examination of case study stations along a light rail line in Los Angeles. The study explores how environmental and social characteristics of the neighborhood affect crime at the station, and how, in turn, the existence of the station affects crime at the neighborhood. The study utilizes crime statistics, census and ridership data, and environmental data and uses a mix of qualitative and quantitative methodologies, including the compilation of environmental inventories, GIS and spatial analysis techniques, and block-group level correlation and regression analyses. **Key Words:** light rail, environmental design, transit crime, rail station security

Work Completed to Date:

We are building upon a previous study of the green line for which we collected and analyzed ridership data for the Green Line. In this study we have collected and analyzed crime data by station for all stations for 1998 and 1999, and have analyzed the specific location of crime at stations (i.e. at platform, parking lot, or elevator/stairs). We are completing a photographic inventory of all study stations and surrounding neighborhoods as well as an environmental inventory of all study stations and adjacent neighborhoods.

Papers to date:

None to date

Conferences Attended:

None to date.

Percent Complete:

70%

Direct Cost:

\$50,931

Research Title: Reconsidering the Effects of Fare Reductions on Transit Ridership

Principal Investigator:

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Abstract:

This study uses national data maintained by the Federal Transit Administration and more detailed demographic, economic, and operating data for a sample of transit operators to examine the influence of fare reductions on transit ridership. Using data from the National Transit Database, we are first conducting a statistical analysis of the relationship between changes in fare levels and ridership on U.S. public transit systems, taking into account many of the factors shown in the literature to affect ridership. One goal of this first phase is to identify cases where fare reductions, which include de facto fare reductions such as free transfer and discount multi-ride tickets, have been associated with substantial ridership increases. These cases, which will almost certainly include the New York MTA in the mid-1990s, will then be explored in more detail through interviews and examination of detailed budgetary, operating, population and employment data. Our literature review of past studies shows large variance in fare elasticity by characteristics of transit trips, types of fare changes, socio-demographic characteristics of riders, and research methods, but does not provide definite conclusion on fare elasticities. In addition, we have found no systematic studies examining fare-reduction elasticities for U.S. transit systems in recent years accounting for the changes in auto availability among households. We will conclude this work by examining the role of fare reductions in stimulating additional ridership taking into account the present socio-demographic characteristics of riders in the U.S. transit systems. **Key Words:** fare reductions, transit ridership, transit fare elasticity

Work Completed to Date:

We have begun the data collection and analysis and are evaluating cases.

Papers to date:

None to date

Conferences Attended:

None to date

Other Accomplishments:

None to date

Percent Complete:

50%

Direct Costs:

\$33,406

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

Principal Investigator:

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Abstract :

This project provides a case study of an informal transportation mode - camionetas or mini buses (vans). I hope to document and better understand the day-to-day functions and the consumers who use this travel mode. Throughout California, immigrant and other low-income groups are increasingly using alternative and in some instances informal or illegal (not regulated) modes of transportation. For example, there exist many unregistered camioneta or mini-vans (gypsy) that transport riders throughout California and beyond the U.S. Mexican border. The attraction of this form of transportation is its low cost, door-to-door service, and convenience (flexibility) of scheduling. Three primary research methods will drive this study: 1) referral sampling and archival research, 2) in-depth interviewing, and 3) participant observation (ethnography). Data collected from this initial study will be used as a springboard for a larger, more comprehensive research study on this burgeoning travel mode. The objective is to document, and better understand the day-to-day functions and the consumers who use mini buses (vans). **Key Words:** paratransit, vans, transportation regulation

Work Completed to Date:

I have completed all of the archival research, undertaken several interviews, and have taken two ethnographic field trips.

Papers to date:

None

Conferences Attended:

None to date.

Other Accomplishments:

None to date

Percent Complete:

60%

Direct Cost:

\$10,000

An Evaluation of Local Option Taxes in California

Principal Investigator:

Martin Wachs, Director
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Abstract:

Residents of 18 California counties have voted to raise their sales taxes to pay for transportation improvements. Collectively, these local option taxes generate roughly \$2 billion for investments in transportation services and infrastructure each year. This development has been hailed as an important step forward for local self-reliance and fiscal accountability in transportation finance. This proposed study is the first comprehensive evaluation of what has been accomplished with these local tax programs. It examines how the revenues have been used, and the extent to which the achievements of these programs match the promises made to voters. It explores larger questions about how this form of transportation finance has shaped transportation planning at the state level. **Key Words:** transportation finance, sales tax, transportation services, infrastructure

Objective:

A comprehensive evaluation of what has been accomplished by over \$2 billion in annual investment into transportation services and infrastructure from local sales tax programs.

Tasks:

Analysis of county tax programs, interviews with staff and other key informants, evaluation of impact of overall state programs.

Papers to date:

Amber Crabbe, Rachel Hiatt, Susie Poliwka, and Martin Wachs, **Local Option Sales Taxes in California**, Draft Final Report Submitted to the California Policy Research Center on July 24, 2001. To be revised after comments are received from several reviewers. (This work is jointly sponsored by the California Policy Research Center.)

Conferences Attended:

None specifically using the resources of this grant. We have attended three regularly scheduled meetings of the Self Help Counties Coalition, the "association" of counties that have such sales taxes.

Other Accomplishments:

Professor Wachs appeared in a thirty minute video that is used by the Self Help Counties Coalition to publicize the role of county sales taxes in California Transportation Finance. Also, we attended the groundbreaking ceremony of a transportation project in Stockton that was financed by a county sales tax measure. We have been asked to present the results of this research at the annual conference of the "California Self-Help Counties Coalition" in November.

Percent Complete:

90%

Direct Cost:

\$15,047

Understanding and Modeling Driver Behavior in Dense Traffic Flow

Principal Investigator:

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This research will examine drivers' car-following behavior in dense traffic flow and identify the critical behavioral elements and parameters that control traffic flow phase transitions. Such an understanding will aid the development of more sound microscopic traffic models that are the central building blocks of popular traffic simulation packages such as CORSIM, TRANSIMS and PARAMICS. The specific tasks include: 1) understanding situation-related driver psychology and driver behavior from empirical evidence, 2) identify critical factors that control phase transitions in traffic flow and 3) incorporate these factors into microscopic traffic flow models to enable them to reproduce certain important yet elusive traffic phenomena such as the often observed "capacity-drop" and stop-start waves. **Key Words:** driver psychology, behavioral parameter, microscopic traffic flow models, phase transitions, traffic flow

Papers to Date:

H. M. Zhang and T. W. Kim (2001) "A car-following theory for multiphase vehicular traffic flow," pre-print 01-3456, 2001 TRB Annual Meeting, accepted for publication in Trans. Res. B.

Conferences Attended:

2001 TRB Annual Meeting.

Other Accomplishments:

A doctoral proposal based on this work is successfully defended.

Percent Complete:

80%

Direct Cost:

\$10,000

YEAR 13 2000-2001 DISSERTATION GRANTS

In Year 13, 10 UCTC Dissertation Grants were awarded to students who had advanced to candidacy. A faculty committee reviews the applications and selects the winners based on the originality and innovation of the proposed research and the student's overall qualifications and performance. Abstracts of the winning grants are presented below.

Year 13 - 2000-2001 Dissertation Grants

The Ethical Challenges and Professional Responses of Travel Demand Forecasters

P. Anthony Brinkman, UC Berkeley

Chair: Martin Wachs

The objective of this research is foremost to understand why, and, to a lesser extent, how, modelers (a) generate biased travel demand forecasts and (b) tolerate the misuse of their work. A secondary goal of this study is to collect data necessary to suggest practicable steps to reform. In addition to relying on grounded theory to do this, the investigator plans to test a number of working hypotheses, which hinge on accepting or rejecting the premise that modelers as a group are corrupt. Based largely on metaphor theory, these hypotheses adopt the latter position and describe how ostensibly thoughtful, well-meaning transportation professionals systematically make questionable ethical decisions. The research represents the next step towards crafting practicable solutions to a costly societal problem. **Key words:** travel demand forecasts, ethics

Voluntary Accelerated Vehicle Retirement as a Pollution Reduction Strategy

Jennifer Dill, UC Berkeley

Chair: Martin Wachs

Older vehicles are a significant source of air pollution. In response to this problem, several regions have adopted or are considering Voluntary Accelerated Vehicle Retirement (VAVR) programs. In such a program, public agencies and private companies offer people money, usually \$500-750, for their old vehicle (e.g. pre-1981), which is then scrapped. The purpose of this research is to assess the impacts of VAVR programs on air pollution and household mobility. The research will be largely quantitative, with some qualitative research on the history and extent of VAVR programs. Two new surveys of program participants and non-participants will supplement existing survey data, emissions models, and other data. **Key Words:** air pollution, auto emissions, vehicle retirement

A History of Transportation Institutions in the Bay Area

Louise Nelson Dyble, UC Berkeley

Advisor: Robin Einhorn

The inability of planners and politicians to coordinate regional planning in the San Francisco Bay Area during the twentieth century has been at the root of the persistent inefficiency and inadequacy of its transportation system. The institutions that have been developed over the years to regulate and administer transportation are important elements in the administration as well as formulation of policy. This dissertation will trace the history of transportation institutions within their political, social, economic and ideological context to understand the process and the consequences of their construction. A few key decision points that provided the opportunity to coordinate regional transportation planning will be examined in detail: the financing and administration of the Golden Gate and San Francisco-Oakland Bay Bridges, the defeat of the Golden Gate Authority in the 1950s, the "freeway revolts" of the 1960s, and the creation of the Bay Area Rapid Transit District. The development of the overall institutional framework will be considered, as well, including the formation of the California Department of Transportation and the Metropolitan Transportation Commission. This history will give special consideration to the relationships between planners, political groups, business interests, and state institutions in the formulation of transportation

policy and construction of transportation institutions. **Key words:** transportation history, regional planning institutions, business, transportation policy

Value of Time and Mode Choice Under Road Congestion Pricing

Arindam Ghosh, UC Irvine
Advisor: David Brownstone

The objective of this dissertation is to examine the accuracy of stated preference (SP) analysis in the context of estimating value-of-time (VoT) from congestion tolls. Using panel survey data from the San Diego I-15 Congestion Pricing Project (SDCPP), I examine the choice between taking a free congested lane versus a tolled uncongested alternative. I also compare VoT estimates between SP and revealed preference (RP) studies, since such differences could lead to very different conclusions about the feasibility of a project. I consider whether there is heterogeneity in VoT, and examine the value of a reduction in the uncertainty in travel time. **Key words:** congestion pricing, stated preference, value of time

The Institution of Infrastructure and the Development of Port-Regions

Peter Hall, UC Berkeley
Advisor: Annalee Saxenian

My dissertation asks what role local public infrastructure agencies play in regional economic development, using case studies of ports and their relationships with shippers, producers, and other public and private organizations. How do port managers and planners decide what transportation infrastructure to provide, and how do firms decide which transportation services to demand? I use two case studies of ports and their experiences with automobile shipment to show that commodity flows and patterns of port usage reflect both port and firm strategy, mediated by institutionalized relationships. I also show that the selective patterns of specialization and concentration in automobile shipment are being replicated for other commodities. The resulting economic geography has important implications for surface transportation planning. My dissertation suggests that planners should pay more attention to relationship

Key words: transportation institutions, port strategy, commodity flows

Empirical Measurement Of Barriers To Public Transit For The Vision-Impaired And The Use Of Remote Infrared Auditory Signage For Mitigation

James Robert Marston, UC Santa Barbara
Advisor : Reginald Golledge

The ADA has mandated equal access for all populations but for those without sight, equal access is still not available. How people access transit information or find the correct area, mode or amenities are all major problems for those without sight. This research examines these and many other situations that limit access to urban opportunities and transit. Using data about trip-making activities and the problems and difficulties of travel faced by 30 legally blind subjects, the dissertation documents the wide range of transit and travel tasks that they must face. Walk times, error production, requests for assistance, and transfer behavior are analyzed and actual and foregone trips are determined. In addition, empirical field tests at the San Francisco CalTrain station where Remote Infrared Audible Signage (RIAS) had been installed, are used to analyze how RIAS affects the difficulty of travel. **Key words:** Blind access, ADA, transit, disability, urban transportation

Dynamic and Stochastic Fleet and Freight Management: Algorithms Development and Performance Analysis

Xiangwen Lu, UC Irvine

Advisor: Amelia Regan

Improving the overall efficiency of the freight transportation systems reduces costs to consumers, improves the ability of companies to meet customer service desires and improves national and regional economic strength. Improving the efficiency of emergency and police dispatching saves lives. Improve the efficiency of utility repair fleets saves money and improves the quality of lives for affect consumer customers and businesses. The last several years have witnessed a sharp increase in interest in stochastic and dynamic routing and scheduling: the probabilistic traveling salesman problem, the dynamic traveling repairman problem. We combine stochastic optimization, queuing theory analysis and static optimization to develop and analyze algorithms for these problems. Our preliminary results extend results provided by other logistics researchers and computer scientists. Namely that if we apply optimal deterministic static solutions properly in a dynamic and stochastic environment, that we can obtain the asymptotically optimal solution for the dynamic problem. **Key words:** freight, fleet management, algorithms

The Road Less Traveled: Land Use and Non-Work Travel Relationships in Portland, Oregon

Michael J. Greenwald, UC Irvine

Advisor: Marlon Boarnet

This dissertation develops a behavioral model of non-work travel mode splits to examine how elements of urban form influence travel decisions, using data on individual travel patterns and land use characteristics of Portland, Oregon. The working hypothesis is that land use elements can improve non-automobile travel time, thus changing the relative times requirements for completing trips by various modes. Because trip times have been identified previously as a component cost of making trips, anything changing relative trip time requirements between travel modes will change mode splits. Preliminary analysis confirms this hypothesis. The primary sources of data are the 1994 Household Activity Travel Survey and the Regional Land Information System, both maintained by the Portland Metropolitan Services District. **Key words:** non-work travel, urban form, mode splits

Development of Pavement Performance Models for Road Infrastructure Managemen

Jorge Prozzi , UC Berkeley

Advisor: Samer Madanat

The objective of this research is the development of pavement performance models to be primarily used for the management of road infrastructure. Such models can be used to facilitate activity planning, project prioritization and budget allocation, and at a project level, to establish the specific corrective actions needed, i.e. maintenance and rehabilitation (M&R) work, and their timing. Cost allocation also can be done with such models. In this research, riding quality is used to evaluate pavement performance. Two main measures of riding quality are used: serviceability and roughness. A by-product of this research is an equation to convert measures of riding quality from serviceability to roughness and vice versa. **Key words:** pavement management systems, performance prediction, cost allocation, serviceability, roughness

Congestion Pricing and Diversity in the Valuation of Travel Time

Jia Yan, UC Irvine

Advisor: Kenneth Small

This project will measure observed and unobserved diversity in value of time and value of reliability. Based on the estimated values, the project will investigate the implications of this diversity for congestion pricing policies. Sample enumeration methods will be used. **Key words:** value of time, value of reliability, congestion pricing

FUNDING SOURCES AND EXPENDITURES

It is the UCTC's longstanding policy to commit all funds received from our sponsors, the US Department of Transportation and the California Department of Transportation, in the year that they are received. Occasionally funds are not fully expended in the year received; in such cases the funds may be carried over into the next fiscal year with the permission of the UCTC Director, but remain committed to the categories to which they were initially allotted. Therefore expenditures and allotments should be the same.

Our report is based on 2000-2001 program allotments using 2000-2001 funds received. Allocated amounts differ in some cases from amounts initially budgeted in our prospectus for the year, because of changes in salaries or expense items, or reallocations of administrative budget amounts to research and technology transfer accounts.

2000-2001 funding sources for the University of California Transportation Center were \$862,300 from the US DOT matched dollar-for-dollar by \$862,300 from the California Department of Transportation. Additional contributions not counted in this total include unbilled faculty and student time devoted to research projects, UC waiver of overhead on state funds, and most UC administrative services.

Categories	Amount (\$)	% of total
Center Director Salary	\$58,500	3.4%
Faculty Salaries	\$201,192	11.7%
Administrative Staff Salaries	\$95,827	5.6%
Other Staff Salaries	\$0	0.0%
Student Salaries	\$450,812	26.1%
Staff Benefits	\$30,511	1.8%
Total Salaries & Benefits	\$836,842	48.5%
		0.0%
Scholarships	\$610,000	35.4%
Permanent Equipment	\$5,000	0.3%
Expendable Property & Supplies	\$166,620	9.7%
Domestic Travel	\$38,032	2.2%
Foreign Travel	\$0	0.0%
Other Direct Costs:	\$0	0.0%
Subtotal	\$819,652	47.5%
Total Direct Costs	\$1,656,494	96.1%
F&A (Indirect) Costs	\$68,106	3.9%
TOTAL COSTS	\$1,724,600	100.0%
Federal Share	\$862,300	50.0%
Matching Share (Caltrans)	\$862,300	50.0%
		0.0%
TOTAL REVENUES	\$1,724,600	100.0%

Approximately one-third of total revenues was spent on scholarships and fellowships and about 26 percent was spent on student salaries. Faculty salaries accounted for another 12 percent of the total. About 11 percent of UCTC revenues were spent on administration including the Director's salary. Access magazine and reseach and tech transfer expenses account for most of the remaining costs. University overhead, which is waived on the Caltrans portion of the grant, accounted for 3.9% of the total.

Figure 1 illustrates revenues and Figure 2 illustrates expenditures for UCTC in 2000-2001 (Year 13.)

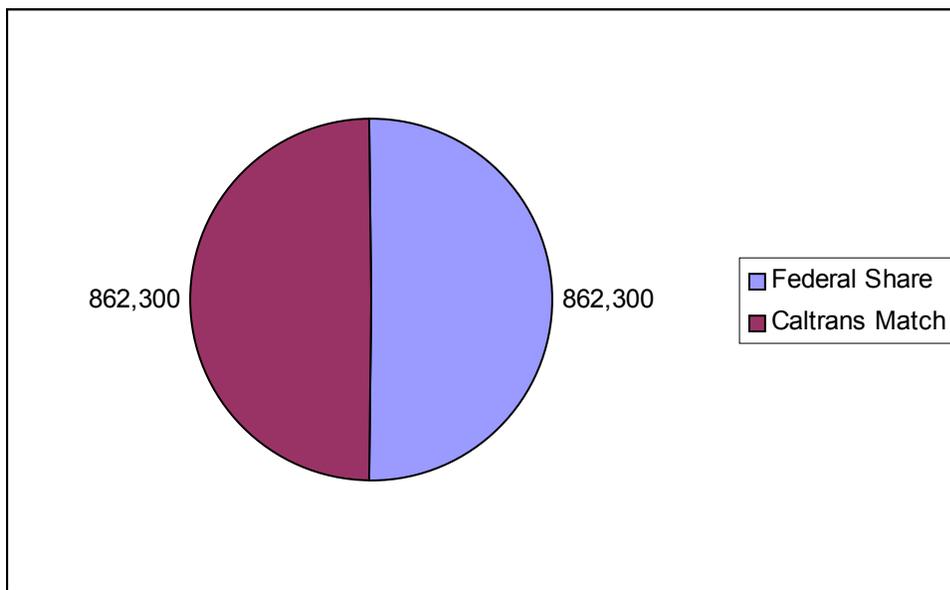


Figure 1. UCTC Revenues, 2000-2001 (Year 13)

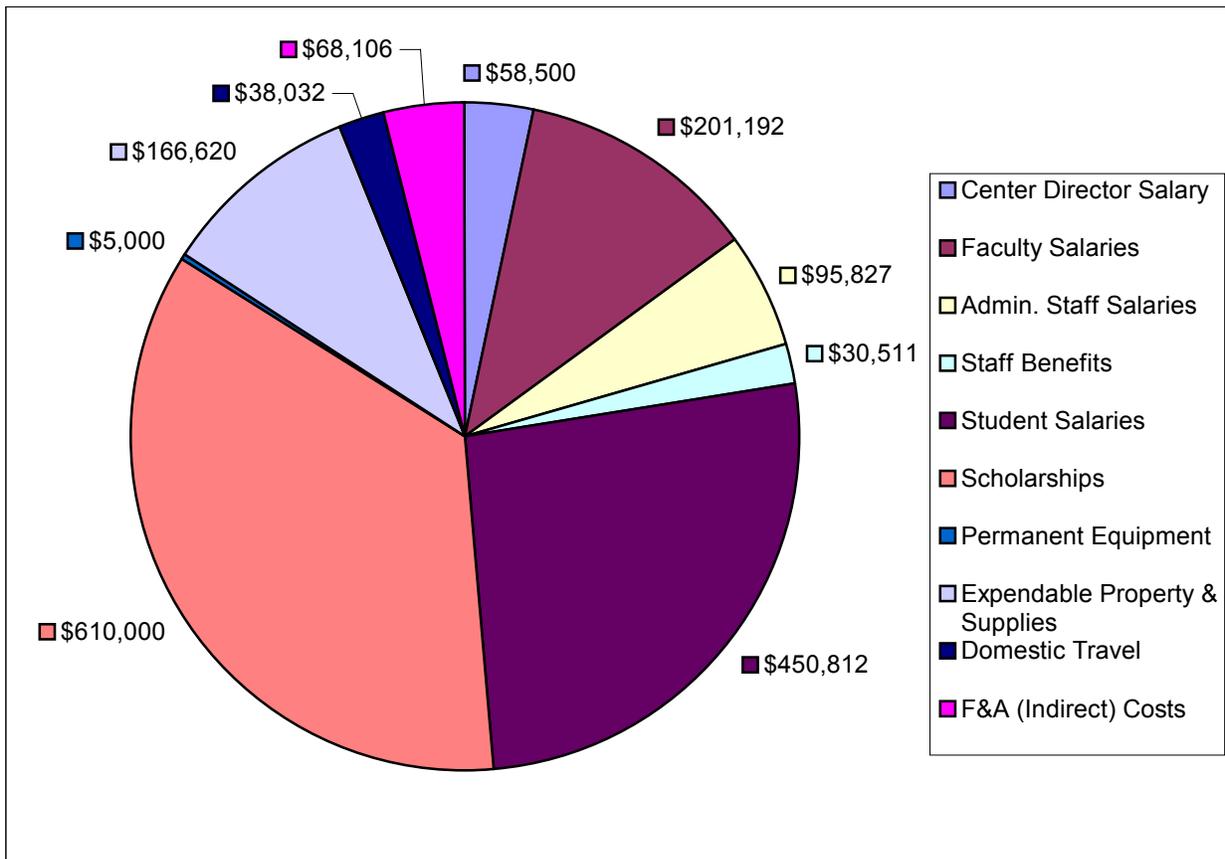


Figure 2. UCTC Expenditures, 2000-2001 (Year 13)

Appendix 1. Glossary

ACCESS - the research magazine published by the University of California
CAD- computer-aided design
CALTRANS- the California Department of Transportation
CMA- Congestion Management Agency, special-purpose county-level organizations in California
EPA- the Environmental Protection Agency
FHWA- the Federal Highway Administration of the US Department of Transportation
FTA- the Federal Transit Administration of the US Department of Transportation
FTE- full-time equivalent (a measure of staffing levels)
GIS- geographic information science / geographic information systems
GSR- graduate student researcher
IGS- the Institute of Governmental Studies at UC Berkeley
IITPS- the Norman Y. Mineta International Institute for Transportation Policy Studies at San Jose State University
ISTEA- the Intermodal Surface Transportation Efficiency Act
ITS - the Institute of Transportation Studies at the UC Berkeley, UC Davis, UC Irvine, and UCLA
IURD - the Institute of Urban and Regional Development at UC Berkeley
METTRANS- the Center for Metropolitan Transportation Studies at the University of Southern California
MPO- Metropolitan Planning Organization
NSF- National Science Foundation
OECD- the Organization for Economic Cooperation and Development
PATH- Program for Advanced Transit and Highways
PI- Principal Investigator
TEA 21- the Transportation Efficiency Act for the 21st Century
TRB- the Transportation Research Board
UC- the University of California, a nine-campus public institution
UC BERKELEY- the Berkeley campus of the University of California
UC DAVIS- the Davis campus of the University of California
UC IRVINE- the Irvine campus of the University of California
UCLA- the Los Angeles campus of the University of California
UCTC- the University of California Transportation Center
USC - the University of Southern California, a private university
US DOT- the US Department of Transportation
UTC Program- the University Transportation Centers Program