



**Year 20 (2007-2008)**  
**Annual Report**  
**For the**  
**University of California Transportation Center**

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## **ANNUAL REPORT**

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## **ABOUT UCTC: OUR TWENTIETH YEAR**

The University of California Transportation Center (UCTC) is a multi-campus organization headquartered on the UC Berkeley campus. We carry out basic and applied research, and publish it in journals and on the web. We organize and participate in conferences and workshops to discuss our findings and identify new research needs. We work with international, national, state, regional and local agencies and private organizations to put our research into practice. We offer fellowships to entice the best students into careers in transportation. We support education programs of UC academic departments offering transportation degrees, offer training sessions, lectures, and symposia for practitioners, and publish a magazine designed to communicate our work to a broad nontechnical audience. We are funded by the US Department of Transportation and the California Department of Transportation.

2007-8 was UCTC's 20<sup>th</sup> year as the Federal Region 9 University Transportation Center (UTC). The year was at once a successful year for us, and one of the most difficult we have faced.

The impact of contracting delays in 2006-7 continued to be felt in 2007-8. In mid-2006 UCTC had received approval of our proposal to the US Department of Transportation's Research and Innovative Technology Administration, designating UCTC the Region 9 UTC. In the fall of 2006 UC and Caltrans began the paperwork to put into place the new Caltrans agreement matching the higher amount of funding authorized by Congress. The Caltrans agreement took longer than any of us had anticipated, because Caltrans had to negotiate the expenditure of planning funds with FHWA; but in mid-April 2007 the amendment finally arrived on campus. The delays in Caltrans contracting meant that research UCTC projects for 2006-7 also had to be delayed, with the result that nearly all 2006-7 projects were carried over into 2007-8. We nonetheless issued an RFP that spring for a new round of projects to be awarded in 2007-8, received 21 proposals, and selected 14 for funding. Both federal and Caltrans matching funds were received in time for fall 2007 awards for our twentieth year.

Awards in hand, UCTC faculty and students undertook their research energetically. A total of 17 projects were completed in 2007-8, including all but one of the projects awarded in 2005-6 and all but six of the projects awarded in 2006-7. Five of the 14 2007-8 projects were completed. A total of 16 projects were carried forward into 2008-9.

In addition, UC partnered with several organizations including the UC Transportation Sustainability Research Center, the Global Metropolitan Studies Initiative, and the Hewlett Foundation to expand research horizons. The UCTC also undertook a number of education, and tech transfer activities, supporting the UCLA Lake Arrowhead conference, the UCTC student conference held this year at Santa Barbara, and activities at TRB.

During the spring of 2007, we were greatly saddened to lose two of our colleagues who made a difference in the world: Alex Farrell of UC Berkeley and Charles Lave of UC Irvine.

In April, Alex Farrell, a biofuels expert and associate professor of Energy and Resources at UC Berkeley, died at the age of 46. Alex was director of the new UC Transportation Sustainability Research Center which had been cofounded the previous year by the Berkeley Institute of Transportation Studies, the UC Energy Institute, and UCTC. At the time of his death he was preparing to testify at the state's hearings on low carbon fuels.

Our faculty editor, Charles Lave, passed away in May, two months before his seventieth birthday. Charlie, a transportation economist, was well known for his critical thinking and his emphasis on policy relevance. He was one of the first faculty members to join the then-new UC Irvine campus in the 1960s and he helped found the UC Irvine Institute of Transportation Studies as well as the university-wide UCTC. His incisive but good humored guidance will be greatly missed.

Summer 2007 was a time of further change. The new President of the UC system determined that the Office of the President would need to reduce its role in research oversight and decided to assign most research units to a lead campus. UCTC was asked to report through the home campus of the PI rather than through UCOP. In addition, UCTC's previous administrative services unit, the Institute of Urban and Regional Development, underwent reorganization, and administrative services for UCTC moved to the Institute of Transportation Studies.

As UCTC's twentieth year drew to a close, the State of California experienced the worst delay ever in its annual budget, as well as a severe and growing deficit. After the state fiscal year ended and a new one began with no budget in place, Caltrans was forced to issue contract suspensions, ordering a stop to all work not explicitly exempted. Caltrans subsequently exempted UCTC's grants from the state freeze, on the grounds that both matching money and considerable data would be lost if work were to halt midstream. However, many campuses were unable to assume the risk that the subsequent budget would not approve the expenditures, and so did not allow PIs to expend funds on existing grants or start new ones until the budget was finally adopted in late September. These budget delays mean that many UCTC projects in Year 21 – including some that had been carried forward from previous award years - lost several months of work time.

USDOT funds are critically important to UCTC as they are a main means of support for graduate students in transportation. Loss of the Caltrans match potentially put the federal funds at risk because they must be matched dollar for dollar. To be sure of keeping the federal funds, UCTC prepared an alternative budget. Global Metropolitan Studies projects were suitable for match, coming from foundations and the private sector, and a contingency budget was prepared that showed the GMS funds as match. Luckily, the passage of the California budget meant that we did not have to implement this alternative UCTC budget.

Now that UCTC is over this patch of rough road, we are again underway with our research, education, and tech transfer activities. Meanwhile, I am preparing to step down from the UCTC directorship after 10 years in office and 21 years on the UCTC Executive Committee. A transition to a new director will take place in spring 2009.

I believe UCTC has much to be proud of, and much more to do. UCTC is committed to help develop improved transportation services, more cost-effective and efficient project delivery, better transportation - environmental performance, and more equitable distribution of transportation benefits. Research on these topics helps find new processes, new technologies, and new institutional designs that pay off for all of us. Equally importantly, UCTC's funding attracts the best and the brightest into transportation, helping to produce the leaders of the future.

**-- Elizabeth Deakin**

## UCTC VISION AND THEME

### Vision

UCTC's vision is excellence in transportation education, excellence in transportation research, and a vibrant network of transportation professionals who will put their education and research findings into practice. We recognize that the State of California, Region 9, and the nation face important transportation challenges, among them:

- adjusting transportation services to respond to changes in demographics and activity patterns
- meeting the challenges of a changing economy and changing resource costs and prices
- managing our extensive transportation systems more efficiently
- improving intermodal connections
- providing high-quality freight transportation responsive to new patterns of production, consumption, and costs
- more effectively assessing, communicating, and managing the social, economic, and environmental consequences of transportation programs and projects
- more effectively identifying applications for new technologies that can improve transportation systems performance
- reducing unwanted effects of transportation including congestion, pollution, and global warming
- improving the equity of transportation programs and projects
- assuring that the public health effects of transportation are positive
- moving toward sustainable transportation and land use relationships
- designing better processes for the involvement of diverse public and private interests in transportation planning, decision making and deployment
- developing efficient and equitable mechanisms for transportation finance
- identifying more flexible, innovative, and responsive organizational frameworks for transportation planning and implementation.

We believe that the challenges confronting the transportation sector must be addressed through creative research, development, and deployment, education and tech transfer, all under a broadly scoped but strategically organized research agenda, or theme, that can make our vision a reality.

### Theme

UTCs are asked to identify a "theme", and the UCTC theme is *transportation systems analysis and policy*. This theme is at once broadly scoped and strategically focused, allowing us to conduct research that addresses the variety of challenges facing our nation, region and state and find ways to promote effective implementation, while complementing rather than duplicating other technology-oriented programs at UC such as PATH and the UC Pavement Center.

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 UCTC supports. Our researchers come from a variety of disciplines, including planning, engineering, economics, political science, policy studies, management, public health, environmental studies, geography, history, psychology, sociology, and the natural sciences. Increasingly, both our projects and the researchers themselves are multi-disciplinary. 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 investigated through the UCTC.

## OVERVIEW OF UCTC ACTIVITIES

In accordance with federal UTC program requirements, UCTC carries out an active program of research, educational support, and tech transfer – all made possible by strong institutional support from Caltrans and the University of California as well as USDOT.

### Research

Research is a major focus of UCTC's activities. UCTC research is framed by a clear research agenda, selected through peer review, structured as one year grants, and awarded to PIs on a one project at a time basis.

*Research Agenda:* All UCTC research grants are awarded through a process that is framed by our theme of systems analysis and policy and guided by specific research priorities called out from time to time by the Executive Committee, our sponsors, and our advisory board.

*Peer Review:* Project selection relies on outside peer review. Project selection is highly competitive, as we usually can fund less than half the research proposals that we receive. To handle the difficult process of choosing new projects, we conduct a double-blind review of all proposals, and then call upon a panel of outside experts who serve much the same function as an editorial board, evaluating the reviews and advising the Director on the projects that appear most worthy of funding. The Director makes the final choices of projects. This process is a major undertaking, but we believe that it produces the best quality research possible.

*One Year Grants:* Our policy is to provide one year research grants with a report due at the end of the year. Multi-year projects can be proposed but must be structured to produce a publishable report every year, and a proposal must be submitted and evaluated for each additional year.

*One Project at a Time:* Caltrans has asked all UTCs in California to implement a "one project at a time" rule, i.e., no Principal Investigator may have more than one incomplete project at any time. We have begun to implement this rule with the awards made this grant year for the next (2008-9) grant cycles, despite the severe delays in funding. We will fully implement the one project at a time rule in the next (2009-10) grant cycle.

The UCTC's success in research relies upon a carefully managed solicitation and project selection process. For faculty research, the 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.

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 recent 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. Proposals are submitted by email and reviews also are completed electronically.

Due to high demand for UCTC funding, budget restrictions were put in place in 1999-2000 and are applied in any year when funds actually received (after RABA or any other adjustments) fall short of authorization levels by more than ten percent. Under the restriction policies, summer salary for faculty is limited to one month and most projects are limited to one graduate student researcher or undergraduate intern per faculty member for the academic year. Costs of supplies, postage, computer expenses, travel, etc. are limited to amounts specified in the RFP unless additional, itemized expenses were justified as necessary for the conduct of the research. Secretarial and clerical support services are not allowed.

### *Proposal Review Process*

All faculty research proposals undergo confidential external review by transportation experts - university researchers and practicing professionals. The UCTC Director selects three or four persons to review each proposal; a minimum of two, and preferably 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. Recent experience is that it takes 3-4 requests to get two timely reviews.

Reviewers are chosen based on their expertise with the subject matter of the proposal. A reviewer list of over 200 individuals is maintained and includes experts from universities, government (the US DOT, other federal agencies, Caltrans, other state agencies, regional agencies, local governments, nonprofits (research groups, foundations) and private for-profit organizations. Faculty members, advisors and sponsors are asked to provide additional names of reviewers from time to time, so that the list is regularly updated.

External reviewers are asked to rate the proposals excellent, very good, good, fair, or poor and 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.
- Any other issues the reviewer deems important.

The Director and staff review the staffing plan and budget for compliance with UCTC rules, and consider the reasonableness of any special budget requests (e.g., additional direct expenses such as travel costs, survey costs, testing, etc.)

### *Project Selection Process*

Reviews are compiled and the proposals are sorted into three categories: Definitely Fund, Consider Funding. And Do Not Fund. For proposals ranked in the middle category, additional reviews are conducted by a panel of outside experts, who advise the Director on the ranking of these proposals. UCTC staff members also review each PI's past performance on UCTC-funded projects (if any) and evaluate the overall fit of the proposed work to the UCTC theme. The Executive Committee is also asked to comment. The UCTC Director then uses the reviews, the outside experts' recommendations, and the staff reviews in making the final selection of projects for funding. In making the final choices, the Director also takes into account the desirability of continuing an ongoing research project into a second phase, versus initiating research on a new topic of importance.

The Director may require changes on some proposals, for example, to fund selected tasks only or to seek revisions in response to reviewers' comments. Further, the Director may provide "seed funding" to proposals in the middle-

ranked category. These small grants allow a researcher to begin the investigation of the research topic and further develop the ideas and approach, with the possibility of applying for additional funds in later years.

### *Research Performance Tracking*

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 (both as part of grants, and as funds allow, from UCTC headquarters funding) 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.

The academic value of UCTC-supported research is evidenced by:

- publication in peer-reviewed journals
- academic awards
- citations in the literature
- invitations to organize and participate in important conferences and meetings
- requests for guest lectures
- requests for collaborative research and exchanges.

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 for UCTC researchers to testify before elected and appointed officials (Congress, the state legislature, city councils, county boards of supervisors, transit boards)
- requests for UCTC researchers to participate in meetings, briefings, and other collaborative activities and exchanges
- requests for UCTC researchers to provide technical assistance to government or the private sector
- changes in federal, state, regional and local transportation policies following recommendations based on UCTC research.

### **Education and Student Support**

UCTC not only carries out research but also contributes to transportation education through fellowship programs, funding for course and curriculum development, our competitive PhD dissertation grant program, and the research assistantships offered as part of faculty research projects. Our objective is to help produce a vibrant network of transportation professionals who will put their education and research findings into practice.

Fellowships are offered only to graduate students enrolled in formal transportation programs. Under USDOT rules, only US citizens and permanent residents are eligible for fellowships. However, faculty from any of the UC campuses (except Davis, which has its own UTC) may apply for a research project and both international and domestic students may work on that project. Likewise, students from any of the UC campuses except Davis may apply for a dissertation grant, which is treated as a project if the student is non-US.

Course support is provided by application to the UCTC Director. Grants are typically under \$20,000. Eligible activities include (in order of priority) 1) the development of a new, permanent course or curriculum, 2) the major revamping of an existing course or course sequence to incorporate new materials or new teaching approaches, and 3) occasionally, special seminars taught by visiting scholars, leading practitioners, or other temporary appointees that offer especially valuable opportunities for students to be exposed to new ideas and approaches. Both graduate courses and undergraduate courses in transportation have received UCTC support. UCTC will not support a new course for more than three years nor will UCTC support the redesign of an established course more often than once every six years.

More details on these programs are provided in the following sections.

### ***Education Programs***

Formal programs and concentrations in transportation are currently offered by UCTC-affiliated departments at Berkeley, Davis, Irvine, UCLA, and UC Santa Barbara. Additional courses with significant transportation content are offered at other campuses of the UC system, including UC San Diego. Most UC transportation degree programs are in civil engineering or city planning. However, other departments including architecture, chemical engineering, computer science, economics, electrical engineering, energy resources, environmental studies, geography, landscape architecture, law, management, mechanical engineering, operations research, political science, public policy, sociology, and urban design now include transportation topics in one or more courses. The growth in transportation offerings and in the inclusion of transportation topics in a variety of courses reflects the increased faculty interest in transportation, for which UCTC can take considerable credit.

As a research unit, the UCTC does not itself offer courses, admit students, hire faculty, or award degrees; instead, we provide support to the academic departments and units that do carry out these functions in the UC system. In addition, UCTC research appointments for graduate and undergraduate students are a form of education and training, and many students receive course credit for participation in UCTC-funded faculty projects.

### ***--Graduate Programs***

Formal degree graduate programs or concentrations in transportation are offered on several campuses in the UC system, including Berkeley, Irvine, UCLA, Santa Barbara and Riverside. The civil and environmental engineering departments at Berkeley and Irvine offer transportation engineering degrees. Programs in transportation planning and policy are offered at Berkeley, 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. The Berkeley transportation program has strong offerings in traffic operations, logistics, systems analysis, and transportation science; Berkeley also has extensive offerings in transportation, land use, and urban design. UCLA is developing a specialty in equity and the transportation needs of low-income communities. Santa Barbara works on GIS applications and advanced modeling, and Riverside focuses on transportation and air pollution.

Each of the campuses continues to maintain and improve their transportation programs, and to update courses and add new course offerings and programmatic specialties as opportunities arise. UC Santa Barbara and UC Riverside's transportation programs are now formally approved and are offering UCTC fellowships. At Berkeley, a new, interdisciplinary Global Metropolitan Studies (GMS) program is underway and has hired its first three of five new faculty members. In the latest review of transport planning programs, Berkeley and UCLA were rated in the top three and Irvine in the top 10. The CEE program at Berkeley consistently ranks in the top three nationally, and the Santa Barbara Geography Department is ranked fourth.

### *--Undergraduate Programs*

UCTC funding for undergraduate education at the various campuses has continued to be focused on the development of new transportation courses. UCTC will fund a new course for up to three years after which it should be approved and funded as part of the regular curriculum. Undergraduate transportation courses offered with UCTC sponsorship have been well subscribed and well received, and have helped to spark interest in careers in transportation. A number of the undergraduates from these courses enroll in graduate transportation programs at UC or other top transportation programs.

### *--Continuing Education*

UCTC-sponsored conferences, symposia, and lecture series offer opportunities for both academics, practitioners, and elected and appointed officials to learn about, discuss and debate new ideas in transportation. Each year UCTC supports such events and also provides funding so that UCTC faculty and students can attend other conferences to present their work.

In addition, 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.

### ***Student Support***

UCTC provides student support in the form of fellowships, graduate student researcher appointments, doctoral dissertation grants, and an annual student of the year award.

### *--Fellowships*

US graduate students enrolled in any of UC's formal transportation programs (except Davis, which funds its programs through its own UTC) are eligible for UCTC fellowships. UCTC fellowships provide support for university fees and living expenses and may be combined with part-time research appointments not to exceed ten hours a week. Academic departments nominate the students on the basis of grades, test scores, letters of recommendation, record of accomplishments, and commitment to a career in surface transportation. Student must have an exceptional record and outstanding potential for a career in surface transportation 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. A student who is offered a fellowship from another program (e.g., an Eisenhower Fellowship or a UC Chancellor's Fellowship) is generally not awarded full UCTC funding.

### *--Graduate Student Researcher (GSR) Appointments*

Every faculty research project must include support for at least one graduate student at 49% (or 2 GSRs at 25%) during the academic year, with full-time summer salary if funds allow. Currently faculty members are limited to one GSR due to RABA reductions from authorized funding levels. The Executive Committee has concluded that this limitation will continue to be imposed unless actual funding allows a higher level of expenditure. Many faculty members would prefer to support more than one student and UCTC campuses have the students to fill the slots, so we hope that funds will eventually permit fuller funding.

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. Graduate student contributions to research projects are

acknowledged in any publication resulting from research funded in whole or in part 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*

Each year, the UCTC offers up to 10 (occasionally, 11) doctoral dissertation grants. The grants are currently set at \$15,000 (plus indirect costs if applicable). However, if funds allow, this amount will be increased to \$30,000 in 2009. 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. 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. The applicant must have advanced to candidacy for the Ph.D. degree prior to the application deadline and must submit a brief synopsis of the dissertation proposal for review, along with a curriculum vita, graduate school transcripts, and a letter of nomination from the student's principal academic advisor. The pool of applications is reviewed by a committee of faculty and/or recent PhDs 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. The dissertation grant abstracts are listed on our website along with faculty research projects and completed dissertations are published on the website as well.

#### *--Student of the Year Award*

Each year UCTC Executive Committee members choose a Student of the Year, who is awarded \$1000 plus costs to attend the award ceremony held during the annual meeting of the Transportation Research Board (TRB) in Washington, DC each January. The award acknowledges superior academic performance, commitment to transportation research and/or practice, and prospects for contributing to the transportation profession in the future.

### **Technology Transfer**

The UCTC's technology transfer aims for 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; conferences and symposia; policy advising and public service; and outreach efforts to business and community groups and the general public. Continuing education, discussed earlier, is also a tech transfer activity. Our ultimate objectives are to increase public understanding of transportation problems and opportunities for improvement, and to help transportation professionals to address transportation problems using the latest research findings and innovations.

UCTC has made an ongoing commitment to fund 1) The UCLA Lake Arrowhead Conference on Transportation, Land Use and the Environment; and 2) the UCTC student conference, organized by students and rotated among the five campuses with transportation programs. In addition, in 2007-8 UCTC joined with PATH and the other California UTCs to offer a major conference on our research. The UTC-PATH conference will be held in 2008 for a second time, after which a decision will be made on whether to continue it or to pursue smaller conferences.

Each of these activities is discussed in more detail below.

#### *--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 UCTC website. In addition, we produce the twice-yearly ACCESS Magazine, which summarizes UCTC-sponsored work as well as other relevant work at the University of California in a style designed for a general

audience. We distribute hard copies of ACCESS and also post it on our website, where readers can download the entire magazine or individual articles.

Managing Editor Melanie Curry works closely with researchers to produce informative, readable articles, even on topics that are highly technical and specialized. With the death of faculty editor Charles Lave, Professor Donald Shoup of the UCLA Department of Urban Planning has agreed to serve as Faculty Editor for ACCESS. In addition, guest editors will help produce issues of ACCESS from time to time.

Periodically we remind UCTC faculty affiliates to send us their papers produced in whole or in part with UCTC funding. We publish most of these papers or reprints on the UCTC website and provide links to others. UCTC publications and reprints of UCTC-funded journal articles are distributed free of charge. In addition, we post copies of the dissertations funded with UCTC's assistance (See [www.uctc.net](http://www.uctc.net).)

#### *--Conferences and Symposia*

UCTC grant recipients are expected to participate in conferences and symposia to communicate their research findings to both academics and practitioners. 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.

The UCTC annually supports the Lake Arrowhead Conference on Transportation, Land Use and the Environment, designed to bring together researchers, practitioners, and elected officials to discuss and debate important policy issues, as well as the UCTC Student Conference, designed to give graduate students the experience of organizing a conference, presenting their work, and discussing the work of their peers. The UCTC also helps faculty members to organize special research conferences and events as opportunities arise, when funds are available.

Travel to conferences is supported as part of research grants, and each campus is provided a travel fund so that faculty and students can participate in the Annual Transportation Research Board meeting. As funds allow and on a case by case basis, the UCTC also will fund travel to meetings of other learned societies and professional organizations such as the Institute of Transportation Engineers, the American Society of Civil Engineers, the American Planning Association, the Association of Academic Schools of Planning, the American Association of Geographers, the American Political Science Association, and the American Economic Association. In addition, faculty members are provided travel support when they serve on committees for federal, state and local agencies as well as independent organizations such as the National Academy of Sciences.

#### *-- Policy Advising and Outreach*

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 and as funds allow, the UCTC provides travel expenses, meeting expenses or other support, including research support, to enable faculty to provide these public services.

Upon request, UCTC faculty members also work with the news media to provide research findings, data, and expert opinions for articles and reports on current transportation issues.

## MANAGEMENT STRUCTURE AND CENTER STAFF

The University of California Transportation Center is a multi-campus center currently 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 has served several times as a member of the ITS and IURD executive committees. She was acting director of the IURD in 1997-98. Since 2005, she and Sociology Professor Peter Evans have been co-directors of the Berkeley Global Metropolitan Studies Initiative, which involves faculty from a dozen departments. In addition to teaching at Berkeley, she taught for a year at UCLA in 1992-93. 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. The Executive Committee consists of the UCTC Director, the directors of the various campuses' Institutes of Transportation Studies or their representatives, the director of the Institute of Urban and Regional Development or his 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 2007-2008 were:

- **Robert Cervero**, Professor of City & Regional Planning, Institute of Urban and Regional Development representative, UC Berkeley
- **Elizabeth Deakin**, UCTC Director, Professor of City & Regional Planning, UC Berkeley
- **Samer Madanat**, Director, Institute of Transportation Studies, Prof. of Civil and Environmental Engineering, Berkeley
- **Steve Ritchie**, Director, Institute of Transportation Studies, Prof. of Civil and Environmental Engineering, UC Irvine
- **Charlie Lave**, Professor Emeritus of Economics and UCTC Faculty Editor, UC Irvine
- **Jean Daniel Saphores**, Asst. Prof. of Policy, Planning and Design, UC Irvine
- **Brian Taylor**, Professor of Urban Planning, UCLA
- **Don Shoup**, Professor of Urban Planning, UCLA
- **Kostas Goulias**, Professor of Geography, UC Santa Barbara
- **Matthew Barth**, Professor of Electrical Engineering, UC Riverside

The Executive Committee is responsible for 1) establishing the theme for the Center as set forth in the UCTC strategic plan, 2) advising and assisting the director in the development of the strategic plan, which establishes the allocation of funds among research, education, and technology transfer programs, 3) working with the Director in consultation with USDOT, Caltrans, and transportation advisors to identify and designate specific subject matter

priorities for research funding in a particular year, 4) setting rules for allowable expenditures on research projects, consistent with USDOT and Caltrans requirements, 5) conducting an annual review of the Center's overall performance and resources, and redirecting funds and activities as necessary, and 6) when the Directorship of the UCTC becomes vacant, selecting a new director for UCTC.

Members of the UCTC Executive Committee meet in person once a year and transact business in the interim through telephone conference calls and e-mail.

The Executive Committee's time is donated.

### **Center Faculty**

Faculty affiliates of the UCTC are individuals throughout the UC system who participate in the research, teaching, and continuing education programs funded by the UCTC. 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](http://www.uctc.net), with full addresses, telephone and fax numbers, and email addresses.

### **Staff**

UCTC maintains a small staff. The staff members in 2007-8 were:

- **Elizabeth Deakin**, Professor of City and Regional Planning, Director (half time plus summer salary)
- **Eunice Park**, Administrator (through Feb. 2008.) Ms. Park handled day-to-day administration for the Center and helped organize conferences and workshops. She returned to graduate school in Feb. 2008, after which the position has been vacant and assistance has been provided by temporary hires.
- **Karen Frick**, Assistant Director (50% time, beginning February 2008.) Dr. Frick has been in charge of tech transfer and education activities since joining the UCTC staff.
- **Melanie Curry**, Editor (60% time.) Ms. Curry is the managing editor responsible for ACCESS, UCTC's twice-yearly magazine.)
- **Webmaster** – Assistance has been obtained as needed under purchase order (This function will transfer to UCLA under the co-direction of the managing editor and faculty editor in 2008-9).
- **Student Assistants** – as needed for specific tasks.
- **Accounting and Personnel Staff** – UCTC Headquarters accounting and personnel support was provided through June 2008 by the Institute of Urban and Regional Development, UC Berkeley; in July 2008 this function transferred to the Institute of Transportation Studies, UC Berkeley. All other campus-based research, education, fellowship and tech transfer accounting and personnel services are provided by participating research units and departments.

In addition, **Charles Lave**, Professor Emeritus of Economics, UC Irvine, served as faculty editor of ACCESS magazine until his death in May 2008.

**Table 1. UCTC Faculty Affiliates**

<b>First Name</b>	<b>Last Name</b>	<b>Address</b>	<b>City / Campus</b>
Matthew J.	Barth	Ctr. for Environmental Research	Riverside
Evelyn	Blumenberg	Urban Planning	Los Angeles
Marlon G.	Boarnet	Urban and Regional Planning	Irvine
Peter C.	Bosselman	City & Regional Planning	Berkeley
David	Brownstone	Economics	Irvine
Michael J.	Cassidy	Civil & Environmental Engineering	Berkeley
Robert	Cervero	City & Regional Planning	Berkeley
Karen	Chapple	City & Regional Planning	Berkeley
Richard	Church	Geography	Santa Barbara
William A.V.	Clark	Geography	Los Angeles
Linda	Cohen	Economics	Irvine
Jason	Corburn	City & Regional Planning	Berkeley
Randall D.	Crane	Urban Planning	Los Angeles
Carlos	Daganzo	Civil & Environmental Engineering	Berkeley
Kristen	Day	Urban and Regional Planning	Irvine
Karen K.	De Valois	Psych., Vision Sci. & Optometry	Berkeley
Elizabeth A.	Deakin	City & Regional Planning	Berkeley
Joseph	DiMento	Urban and Regional Planning	Irvine
Michael	Disch	Psychology	Berkeley
Bryan	Ellickson	Economics	Los Angeles
J. Gordon	Fielding	Social Sciences	Irvine
William L.	Garrison	Civil & Environmental Engineering	Berkeley
Amihai	Glazer	Economics	Irvine
Steven	Goldman	Economics	Berkeley
Reginald G.	Golledge	Geography	Santa Barbara
Thomas	Golob	Transportation Studies	Irvine
Kostas	Goulias	Geography	Santa Barbara
Michael	Hanemann	Agr. & Res. Econ.	Berkeley
Mark	Hansen	Civil & Environmental Engineering	Berkeley
Robert	Harley	Civil & Environmental Engineering	Berkeley
J. Karl	Hedrick	Mechanical Engineering	Berkeley
Wolfgang	Homburger	Institute of Transportation Studies	Berkeley
Arpad	Horvath	Civil & Environmental Engineering	Berkeley
Judith	Innes	City & Regional Planning	Berkeley

<b>Table 1 cont.</b>			
<b>First Name</b>	<b>Last Name</b>	<b>Address</b>	<b>City / Campus</b>
Allan B.	Jacobs	City & Regional Planning	Berkeley
R.	Jayakrishnan	Civil & Environ. Engineering	Irvine
Adib	Kanafani	Civil & Environmental Engineering	Berkeley
Daniel B.	Klein	Economics	Irvine
Jess	Kraus	Public Health-Epidemiology	Los Angeles
John	Landis	City & Regional Planning	Berkeley
Charles A.	Lave	Economics	Irvine
Robin	Liggett	Urban Planning	Los Angeles
Anastasia	Loukaitou-Sideris	Urban Planning	Los Angeles
John	Lysmer	Civil & Environmental Engineering	Berkeley
Elizabeth	Macdonald	City & Regional Planning	Berkeley
Samer	Madanat	Civil & Environmental Engineering	Berkeley
Michael G.	McNally	Civil & Environ. Engineering	Irvine
James A.	Misener	PATH	Berkeley
Raymond W.	Novaco	Social Ecology	Irvine
Paul	Ong	Urban Planning	Los Angeles
Christos	Papadimitriou	Computer Science	Berkeley
Nadesan	Permaul	Parking and Transportation	Berkeley
Steven C.	Pitts	Center for Labor Research and Education	Berkeley
John M.	Quigley	Public Policy	Berkeley
John	Radke	Landscape Architecture	Berkeley
David R.	Ragland	Public Health	Berkeley
Steven	Raphael	Public Policy	Berkeley
Will	Recker	Institute of Transportation Studies	Irvine
Amelia	Regan	Computer Sciences	Irvine
Stephen G.	Ritchie	Civil & Environ. Engineering	Irvine
Paul A.	Ruud	Economics	Berkeley
Jean Daniel	Saphores	Civil & Environ. Engineering	Irvine
Robert F.	Sawyer	Mechanical Engineering	Berkeley
Allen J.	Scott	Urban Planning	Los Angeles
Raja	Sengupta	Civil & Environmental Engineering	Berkeley
Steven	Shladover	PATH	Berkeley
Donald C.	Shoup	Urban Planning	Los Angeles
Alexander	Skabardonis	Civil & Environmental Engineering	Berkeley
Kenneth A.	Small	Economics	Irvine
Michael	Southworth	City & Regional Planning	Berkeley
Robert C.	Spear	Public Health	Berkeley

<b>Table 1 cont.</b>			
<b>First Name</b>	<b>Last Name</b>	<b>Address</b>	<b>City / Campus</b>
Michael A.	Stoll	Policy Studies	Los Angeles
Jayashankar	Swaminathan	Haas School of Business	Berkeley
Brian D.	Taylor	Urban Planning	Los Angeles
Karen	Valois	Psychology	Berkeley
Kurt	Van Dender	Economics	Irvine
Pravin	Varaiya	Electrical Eng. & Computer Science	Berkeley
Martin	Wachs	Institute of Transportation Studies	Berkeley
Melvin	Webber	UC Transportation Center	Berkeley
Margaret	Weir	Sociology	Berkeley
Arthur	Winer	Public Health	Los Angeles
Candace	Yano	IEOR	Berkeley
Carol	Zabin	Center for Labor Research and Education	Berkeley

## **INSTITUTIONAL SUPPORT**

UCTC's success depends on our strong working partnership with the California Department of Transportation (Caltrans), as well as on the broad support we receive from the University of California. The UC Office of the President, the administrations of the various campuses, the research institutes and departments of those campuses that offer transportation degrees, and the faculty who participate in UCTC activities all contribute to UCTC's activities. Because the UCTC can rely on this substantial institutional support, we are able to devote most of our funding to the direct costs of research, education, and technology transfer.

### **Caltrans Support of UCTC**

As it has done since the UCTC's inauguration, Caltrans matched US Department of Transportation (US DOT) funds dollar-for-dollar. The new agreement, signed in April 2007, provides for match through FY 2011.

### **UC Support**

Since the creation of the Center, the University of California has waived overhead on the matching funds from Caltrans, recognizing the vital educational objectives of the UCTC program and noting that Caltrans funds UCTC's administration and participates in shaping, but does not control, the research agenda. The University again has waived overhead on Caltrans matching funds for the new grant signed earlier this year. In addition, the University provides administrative services, but does not charge overhead on the portion of USDOT funds used for fellowships.

The University has made an even larger commitment to transportation research and education programs through its permanent financial support for faculty positions in transportation. The US DOT now requires a \$400,000 commitment in regularly budgeted institutional funds for a university to be eligible for Center designation; salaries and benefits for the full-time faculty members who conduct transportation research at Berkeley alone greatly exceed that amount.

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. The Institutes of Transportation Studies at Berkeley and Irvine, the Lewis Center / ITS at UCLA, the Institute of Urban and Regional Development at Berkeley, The Dept. of Geography at UC Santa Barbara, and the UC Riverside CE Center for Environmental Research and Technology (CE-CERT) provide research administration and support for UCTC grants.

UCTC faculty and students also benefit from their access to University computer, data, and library resources. 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. A US Census Center at UC Berkeley makes this important data source far more accessible. Our computer facilities include advanced software for modeling, analysis, and data display. 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. Each year UCTC sponsors a visit to each of the UCTC campuses by Librarian John Galloway, as a way of introducing new students to library holdings and services.

Finally, faculty members' time commitments are a substantial source of support for 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.

Participation in the governance of the UCTC is a second way that faculty time is donated. 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. All of this service is provided all free of charge to UCTC.

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. UCTC funding is amplified by the pairing with these other funding sources.

### **Research Partnerships**

The UCTC works closely with the following research centers to coordinate research. It is our intent to complement and sometimes to jointly fund research projects while avoiding duplication.

#### *PATH*

California Partners for Advanced Transit and Highways (PATH) is a multi-disciplinary program headquartered at Berkeley with staff, faculty and students from universities statewide, and cooperative projects with private industry, state and local agencies, and non-profit institutions. PATH's mission is to develop solutions to surface transportation systems problems through cutting edge research and development in the fields of information technology, electrical engineering, mechanical engineering, economics, transportation policy and behavioral studies. Research is organized into program areas: Traffic Operations, Transit Operations, Transportation Safety, and Behavioral Studies.

#### *CCIT*

The California Center for Innovative Transportation (CCIT) was founded by the University of California and the California Department of Transportation to facilitate the development, commercialization and deployment of promising transportation technologies and systems. It is headquartered at UC Berkeley.

#### *NEXTOR*

The National Center of Excellence for Aviation Operations Research (NEXTOR) is a consortium sponsored by the Federal Aviation Administration (FAA), consisting of UC Berkeley, the Massachusetts Institute of Technology, the University of Maryland at College Park and Virginia Polytechnic and State University. Research areas addressed by NEXTOR include advanced air traffic management systems, air traffic safety and security, and the performance and productivity of the nation's aviation system.

#### *Pavement Research Center*

The Pavement Research Center (PRC) is an international authority on pavement structures, materials, and technologies. The PRC's core mission is to research questions for the California Department of Transportation pertaining to the design, construction, rehabilitation and maintenance of the state's 75,000-lane-kilometer network of roads. PRC has branches at both UC Berkeley and UC Davis.

### *Traffic Safety Center*

The Traffic Safety Center (TSC) is a joint venture of the Institute of Transportation Studies and the School of Public Health at UC Berkeley. Its goals are to reduce traffic fatalities and injuries through multi-disciplinary collaboration in education, research, and outreach, and to make traffic safety information widely available. The Center's fields of research include pedestrian safety, passenger safety, and safe mobility for older drivers, and cost-benefit analysis of traffic safety interventions.

### *Volvo Center*

The UC Berkeley Volvo for Future Urban Transport was established in 2004 with funding from the Volvo Research and Educational Foundations after a competition involving a large field of international candidates. The Center's mission is to study the mutual interdependence of urban transportation policy and technology and use the understanding of that concept to devise sustainable transportation strategies for the world's cities. Faculty and students from several engineering departments and from City and Regional Planning are the core researchers.

### *Center for Global Metropolitan Studies*

The Center for Global Metropolitan Studies is a new initiative on the Berkeley campus involving 70 faculty members from a dozen departments. The interdisciplinary center carries out research and outreach and supports teaching on urban and metropolitan problems and opportunities worldwide. Transportation is a significant subject of analysis for GMS and several projects are being provided support by UCTC in the form of office space. In turn, UCTC will publish the results of the work. Faculty members from other campuses participate in GMS activities including research projects and conferences.

### *Sustainable Transportation Research Center*

The Sustainable Transportation Research Center is the newest transportation research initiative at Berkeley, jointly sponsored by ITS, UCTC, the Global Metropolitan Studies Center, the UC Energy Institute, and the UC Berkeley Energy and Resources Group. The center's mission is to find effective responses to the energy and environmental challenges facing transportation systems world-wide while also assuring that they are equitable, economic, and a significant contributor to the quality of life for all.

## **Other Partnerships**

The UCTC benefits from additional partnerships with other UTCs located in California. Two other University Transportation Centers have successfully competed for UTC designation, 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. In addition, Congress designated two additional new centers in California, at UC Davis (as noted earlier) and at Cal State San Bernardino (the Leonard Center). Caltrans has agreed to provide matching funds to all five centers. To coordinate our efforts, the Center Directors and key administrators meet together with Caltrans staff three times a year, with the meeting location rotating among campuses. UCTC invites both faculty and students from the other centers to participate in the annual student transportation conference that we sponsor, to join us at conferences and symposia, and to exchange research results.

UCTC also benefits from the advice and participation of transportation professionals drawn from a variety of public and private organizations. Over 200 individuals outside the UC system are on our reviewer list and over one-quarter of them participated in reviews during the latest grant cycle. About half of the reviewers are from other universities; 20 percent are from federal, state and regional agencies, and thirty percent are from the private sector. In addition, UCTC has received funding from several private firms to help support conferences and workshops.

## ACCOMPLISHMENTS IN 2007-8

Highlights for the 2007-8 grant year at UCTC include the following:

- During 2007-8 UCTC researchers completed 17 projects and made progress on an additional 16.
- UCTC researchers published . The final papers from these projects are published on the UCTC website and many are also published in journals. Additional papers from previously completed projects also are published by UCTC, making the final report but one of a number of products from UCTC research.
- Faculty members from five UC campuses and 8 academic departments submitted 21 proposals in response to the RFP for the 2007-8 grant cycle. Fifty-five individuals served as reviewers, with 30 from universities, 10 from private firms, 2 from nonprofits, 8 from Caltrans, 3 from USDOT, and 2 from other government agencies. Our outside reviewers rated all of the 2006-7 proposals as very good or excellent. However, we were able to fund or partly fund only the 14 most highly ranked proposals - two of which were for different parts of a joint project at Irvine and Riverside. The new project awards went to faculty at Berkeley (3), Irvine (5), Los Angeles (3), Riverside (2), and Santa Barbara (1) campuses.
- The UCTC awarded dissertation grants to eleven UC students, selected from the 17 applications received. Previous UCTC dissertation grant winners served as the reviewers for these awards. The grants went to PhD students at Berkeley (3), Irvine (6), and Santa Barbara (2.)
- The UCTC provided nearly \$1.1million in graduate student fellowships, dissertation grants, and in-state fees for graduate student researchers (GSRs), or about 33% of the UCTC budget. GSR salaries and benefits brought the student share of the total UCTC budget to 54%.
- UCTC-affiliated transportation programs awarded 100 new Masters and PhD degrees, and retained high levels of undergraduate enrollments in transportation courses. Our graduates have joined private transportation firms, universities, nonprofits, and federal, state, and local government agencies.
- The UCTC added 42 research papers to our website (Table 2.)The UCTC website received 63,509 hits and 230,404 papers and reports were downloaded.
- We published two more editions of ACCESS, our transportation magazine, and distributed 20,000 hard copies to readers across the US and overseas. However, more than twice as many readers obtained ACCESS electronically than in hard copy this year –ACCESS downloads totaled 51, 570.
- The UCTC co-sponsored the annual Lake Arrowhead conference, organized by the UCLA Public Policy Extension. The October 2007 event, Planning for Growth, explored the growth forecasts for the California and growth's connections to transportation, land development, and environmental quality .
- The Second Annual Martin Wachs Distinguished Lecture in Transportation was held at UCLA in October 2007. Prof. Anthony D. May of Leeds University, UK, gave the keynote address. The Wachs Lecture was established in honor of Emeritus Professor Marty Wachs, who taught for many years first at UCLA and then at Berkeley, by his former students.
- UCTC hosted the first joint California UTC-PATH research conference in October 2007. The multiday conference was attended by over 350 participants from the UTCs, PATH, Caltrans, other state agencies, transit operators, city governments, federal agencies, nonprofits, consulting firms, and other private sector organizations.

- Faculty members and graduate students affiliated with UCTC presented over 100 papers at sessions of the annual meeting of the Transportation Research Board in January 2008.
- Nikolas Geroliminas was elected the University of California's Student of the Year for 2007-2008. Geroliminas received his PhD from UC Berkeley, where Carlos Daganzo was his dissertation adviser. He is now an assistant professor at the University of Minnesota.
- Graduate students from UC Santa Barbara organized the February 2008 UCTC Student Conference, with Professor Meipo Kwan of Ohio State (a former UCTC dissertation grant winner) giving the Mel Webber Lecture.
- UCTC Director Elizabeth Deakin participated in a retreat with California legislators and administrative leaders to discuss how to align bond expenditures with greenhouse gas reduction goals.
- Assoc. Professor Alex Farrell was one of the co-authors of the state's low carbon fuel standards, working closely with the Air Resources Board and other state agencies.
- UCTC faculty affiliates Adib Kanafani, Robert Cervero, Elizabeth Deakin and David Dowall prepared papers and briefed staff at a workshop in Sacramento attended by over 40 legislative staff and agency department heads.

**Table 2. Research Papers 2007-8**

Cao, Xinyu, Patricia L. Mokhtarian, and Susan Handy	Cross-Sectional and Quasi-Panel Explorations of the Connection Between the Built Environment and Auto Ownership	2007, Fall	817
Houston, Douglas, Margaret Krudysz, and Arthur Winer	Measurements of Diesel Truck Traffic Associated with Goods Movement	2007, Fall	818
Ory, David T, and Patricia L. Mokhtarian	Which Came First, the Telecommuting or the Residential Relocation? An Empirical Analysis of Causality	2007, Fall	819
Ory, David T., Patricia L. Mokhtarian, and Gustavo O. Collantes	Exploring the Cognitive and Affective Mechanisms Behind Subjective Assessments of Travel Amounts	2007, Fall	820
Robelin, Charles-Antoine, and Samer M. Madanat	History-Dependent Optimization of Bridge Maintenance and Replacement Decisions Using Markov Decision Process	2007, Fall	821
Dowall, David, and Jan Whittington	Transaction-Cost Economic Analysis of Institutional Change toward Design-Build Contracts for Public Transportation	2008, Winter	822
Lee, Joon ho, and Michael J. Cassidy	An Empirical and Theoretical Study of Freeway Weave Bottlenecks	2008, Winter	823
Cervero, Robert	Alternative Approaches to Modeling the Travel-Demand Impacts of Smart Growth	2008, Winter	824
Cervero, Robert, and Michael Duncan	Which Reduces Vehicle Travel More: Jobs-Housing Balance or Retail-Housing Mixing?	2008, Winter	825
Johnston, Robert A.	Improved Developer Models for the Sacramento Region	2008, Winter	826
Clay, Michael J., and Robert A. Johnston	Large Real Estate Developments, Spatial Uncertainty, and Integrated Land Use and Transportation Modeling	2008, Winter	827
Kable, Justin Mark	Collecting Construction Equipment Activity Data from Caltrans Project Records	2008, Winter	828
Ximing, Lu	Car Based Transport and Transit Oriented Metropolitan - Chinese Urban Motorization Pathways	2008, Winter	829
Kwon, Jaimyoung, Michael Mauch, and Pravin Varaiya	Components of Congestion: Delay from Incidents, Special Events, Lane Closures, Weather, Potential Ramp Metering Gain, and Excess Demand	2008, Winter	830
Choo, Sangho, and Patricia L. Mokhtarian	Telecommunications and travel demand and supply: Aggregate structural equation models for the US	2008, Winter	831
Nandiraju, Srinivas, and Amelia Regan	Freight Transportation Electronic Marketplaces: A Survey of the Industry and Exploration of Important Research Issues	2008, Winter	832
Yang, Choon-Heon, and Amelia C. Regan	Impacts of Left Lane Truck Restriction on Urban Freeways	2008, Winter	833

Table 2 cont.			
Apivatanagul, Pruttipong "Palm," and Amelia C. Regan	A Solution Algorithm for Long Haul Freight Network Design Using Shipper-Carrier Freight Flow Prediction with Explicit Capacity Constraints	2008, Winter	834
Ong, Paul, and Cheol-Ho Lee	Spatial Pattern of Vehicle Ownership by Vintage	2008, Winter	835
Cervero, Robert, Junhee Kang, and Kevin Shively	From Elevated Freeways to Surface Boulevards: Neighborhood, Traffic, and Housing Price Impacts in San Francisco	2008, Winter	836
Recker, Wilfred	Mitigating the Social and Environmental Impacts of Multimodal Freight Corridor Operations at Southern California Ports	2008, Winter	837
Recker, Wilfred, J. Duan, and H. Wang	Development of an estimation procedure for an activity-based travel demand model	2008, Winter	838
Gao, Shengyi, Patricia L. Mokhtarian, and Robert A. Johnston	Non-normality of Data in Structural Equation Models	2008, Winter	839
Skabardonis, Alexander, Pravin P. Varaiya, and Karl F. Petty	Measuring Recurrent and Non-Recurrent Traffic Congestion	2008, Winter	840
Song, Jiongjiong, Amelia C. Regan, and Srinivas Nandiraju	A Bid Analysis Model with Business Constraints for Transportation Procurement Auctions	2008, Winter	841
Ong, Paul M., and Michael A. Stoll	Why Do Inner City Residents Pay Higher Premiums? The Determinants of Automobile Insurance Premiums	2008, Winter	842
Loukaitou-Sideris, Anastasia	How Safe Is the Ride? Evaluation of Design and Policy Responses to Women's Fear of Victimization and Crime	2008, Winter	843
Horvath, Arpad, and Mikhail Chester	Environmental Life-cycle Assessment of Passenger Transportation: An Energy, Greenhouse Gas, and Criteria Pollutant Inventory of Rail and Air Transportation	2008, Winter	844
Weir, Margaret, Jane Rongerude, and Christopher K. Ansell	Making Participation Matter	2008, Winter	845
Barth, Matthew, and Kanok Boriboonsomsin	Real-World CO2 Impacts of Traffic Congestion	2008, Summer	846
Servin, Oscar, Kanok Boriboonsomsin, and Matthew Barth	An Energy and Emissions Impact Evaluation of Intelligent Speed Adaptation	2008, Summer	847
Boriboonsomsin, Kanok, Oscar Servin, and Matthew Barth	Selection of Control Speeds in Dynamic Intelligent Speed Adaptation System: A Preliminary Analysis	2008, Summer	848
Choo, Sangho, Taihyeong Lee, and Patricia L. Mokhtarian	Do Transportation and Communications Tend to Be Substitutes, Complements, or Neither? U.S. Consumer Expenditures Perspective, 1984-2002	2008, Summer	849

Table 2 cont.			
Mokhtarian, Patricia L., and Xinyu Cao	Examining the Impacts of Residential Self-Selection on Travel Behavior: A Focus on Methodologies	2008, Summer	850
Choo, Sangho, and Patricia L. Mokhtarian	How Do People Respond to Congestion Mitigation Policies? A Multivariate Probit Model of the Individual Consideration of Three Travel-Related Strategy Bundles	2008, Summer	851
Handy, Susan L., Xinyu Cao, and Patricia L. Mokhtarian	The Causal Influence of Neighborhood Design on Physical Activity Within the Neighborhood: Evidence from Northern California	2008, Summer	852
Shen, Zuo-Jun Max, Jyothsna Pannala, Rohit Rai, and Tsz Shing Tsoi	Modeling Transportation Networks During Disruptions and Emergency Evacuations	2008, Summer	853
Smirti, Megan	Modeling and Measuring Greenhouse Gas Reduction from Low Carbon Airport Access Modes	2008, Summer	854
Hansen, Mark, Megan Smirti, and Bo Zou	A Comparative Evaluation of Greenhouse Gas Emission Reduction Strategies for the Maritime Shipping and Aviation Sectors	2008, Summer	855
Zou, Bo, Megan Smirti, and Mark Hansen	Reducing Freight Greenhouse Gas Emissions in the California Corridor: The Potential of Short Sea Shipping	2008, Summer	856
Kanafani, Adib, and Jiangchuan Huang	Securing Linked Transportation Systems: Models of Investment to Reduce Vulnerability	2008, Summer	857
Lu, Xiao-Yun, Matt Hanson, Michael Graham, Eugene Nishinaga, Richard Lu	Investigating the Possibility of Using BART for Air Freight Movement	2008, Summer	858

## **RESEARCH PROJECT STATUS**

A total of 33 projects were underway at the University of California Transportation Center (UCTC) in 2007-8 and are summarized here.

While UCTC projects are designed to be one year in duration, extensions may be granted for good cause. Most commonly, extensions are requested when funding reaches the UC campus considerably after the school term has already begun, making it difficult to arrange student appointments until the following term. That has been the case for UCTC for the last several years because of late or two-phase receipt of funding.

UCTC began its twentieth year, 2007-8, with 19 projects carried forward (eight from Year 18 and 11 from Year 19.) An additional 14 new projects were selected for Year 20 funding. During the year, seven of the eight Year 18 projects and six of the 11 Year 19 projects were completed. In addition, five of the new Year 20 projects were completed. Hence a total of 18 projects were completed. The other 15 projects were carried forward into Year 21 (Table 1).

In the pages that follow, the projects completed this year are presented first, in order of date of award year. Then the projects that are continuing are presented, also in order of date of award. Note that some of the projects new this year (UCTC Year 20) fall into the completed category and some into the continuing category.

**Table 1. UCTC Project Status as of 7/31/2008**

<b>UCTC</b>	<b>PROJECTS COMPLETED IN 2007-8</b>		
1	<b>An Empirical and Theoretical Study of Freeway Weave Analysis</b>	Michael Cassidy, UC Berkeley	YR 18
2	<b>Freeway Deconstruction and Urban Renewal Land Market and Transportation Impacts</b>	Robert Cervero, UC Berkeley	YR 18
3	<b>How Much Do Low Income and Foreign-Born Households Use Public Transportation?</b>	William Clark, UC Los Angeles	YR 18
4	<b>The Effect of In-Transit WiFi Internet Access on The Value of Travel Time Implications for Mode-Choice Models</b>	Adib Kanafani, UC Berkeley	YR 18
5	<b>Bottom-up Bridge Management System</b>	Samer Madanat, UC Berkeley	YR 18
6	<b>The Political Calculus of Congestion Pricing</b>	Donald Shoup, UC Los Angeles	YR 18
7	<b>Estimating Potential Exposure to Diesel Truck Freeway Emissions in Southern California A Methodology for Assessing Air Pollution Impacts of Goods Movement</b>	Arthur Winer, UC Los Angeles	YR 18
8	<b>An Energy and Emissions Impact Evaluation of Intelligent Speed Adaptation</b>	Matthew Barth, UC Riverside	YR 19
9	<b>Relieving Congestion by Real-time Monitoring of Traffic Conditions and Coordination of Traffic Signals Across Zone Boundaries</b>	Michael Cassidy and Carlos Daganzo, UC Berkeley	YR 19
10	<b>Evaluation of the Information Needs of the Distributed Landside Port Planning in California</b>	Mark Hansen, UC Berkeley	YR 19
11	<b>Subcontracting Decisions in California Highway Procurement Contracts</b>	Amelia Regan, UC Irvine	YR 19
12	<b>Modeling Transportation Networks during Disruption and Emergency Evacuations</b>	Zuo-Jun Max Shen, UC Berkeley	YR 19
13	<b>Mode Choice and Destination Choice: Estimations and Simulations for Airport Access in the San Francisco Bay Area</b>	Kurt Van Dender and David Brownstone, UC Irvine	YR 19
14	<b>Traffic Congestion: Quantifying the Real World Impact on Greenhouse Gases</b>	Matt Barth, UC Riverside	YR 20
15	<b>Securing Linked Transportation Systems - Strategies for Urban transportation</b>	Adib Kanafani, UC Berkeley	YR 20
16	<b>Measuring Travel Behavior of Low-Income Households Using GPS Technologies, Diary and Prompted Recall Methods</b>	Paul Ong, UCLA	YR 20
17	<b>Real Option-based Procurement for Transportation Services</b>	Amelia Regan and JP Saphores, UC Irvine	YR 20
18	<b>Modeling the Reliable Transportation Network Design Problems in Case of Disruptions</b>	Max Shen, UC Berkeley	YR 20

**Table 1 cont.**

<b>UCTC PROJECTS CONTINUING INTO 2008-9</b>			
1	<b>Emission and Air Quality Impacts of New Diesel Engine Control Technologies</b>	Robert Harley, UC Berkeley.	Yr 18
2	<b>Robust Traffic Assignment via Convex Optimization</b>	Laurent El Ghaoui, UC Berkeley	YR 19
3	<b>Drivers in Los Angeles: Profile of a Workforce Facing Change</b>	Jacqueline Leavitt, UCLA	YR 19
4	<b>Subcontracting Decisions in California Highway Procurement Contracts</b>	Justin Marion and Ricard Gil, UC Santa Cruz	YR 19
5	<b>Approach to Real-Time Commercial Vehicle Monitoring</b>	Stephen Ritchie, UC Irvine	YR 19
6	<b>Congestion and Accessibility: What's the Relationship?</b>	Brian Taylor, UCLA	YR 19
7	<b>Immigrants and Travel Behavior: Effect of Ethnic Neighborhoods on Commute Time and Mode</b>	Evelyn Blumenberg, UCLA	YR 20
8	<b>Near Source Modeling of Transportation Emissions in Built Environments Surrounding Major Arterials</b>	Marlon Boarnet, Rufus Edwards, Raul Lejano, and J Wu, UC Irvine	YR 20
9	<b>--companion project by the same name at UCR:</b>	Marko Princevac and Mitch Boretz, UC Riverside	YR 20
10	<b>Are TODs Over-Parked? Exploring Housing, Neighborhood, and Environmental Impacts</b>	Robert Cervero, UC Berkeley	YR 20
11	<b>Microscopic Analysis of Travel Behavior Change</b>	Kostas Goulias, UC Santa Barbara	YR 20
12	<b>The Personal Travel Assistant (PTA): Measuring the Dynamics of Human Behavior</b>	Will Recker, Rina Dechter, and C. Rindt, UC Irvine	YR 20
13	<b>Mitigating the Social and Environmental Impacts of Multimodal Freight Transportation Corridor Operations</b>	Steve Ritchie, R. Jayakrishan, O. Ogunseitani, and R. Torres, UC Irvine	YR 20
14	<b>Costs and Effectiveness of Lower-Speed, Environmentally-Friendly Urban Highway Designs</b>	Ken Small, UC Irvine	YR 20
15	<b>Transportation Decision-Makers, Practitioners, and Researchers: Differences in the Production and Use of Knowledge</b>	Brian Taylor, UCLA	YR 20

## **RESEARCH PROJECT STATUS**

A total of 33 projects were underway at the University of California Transportation Center (UCTC) in 2007-8. Their status is summarized in this section.

While UCTC projects are designed to be one year in duration, extensions may be granted for good cause. Most commonly, extensions are requested when funding reaches the UC campus considerably after the school term has already begun, making it difficult to arrange student appointments until the following term. That has been the case for UCTC for the last several years because of late or two-phase receipt of funding.

UCTC began its twentieth year, 2007-8, with 19 projects carried forward (eight from Year 18 and 11 from Year 19.) An additional 14 new projects were selected for Year 20 funding. During the year, seven of the eight Year 18 projects and six of the 11 Year 19 projects were completed. In addition, five of the new Year 20 projects were completed. Hence a total of 18 projects were completed. The other 15 projects were carried forward into Year 21 (Table 1).

In the pages that follow, the projects completed this year are presented first, in order of date of award year. Then the projects that are continuing are presented, also in order of date of award. Note that some of the projects new this year (UCTC Year 20) fall into the completed category and some into the continuing category.

**Table 3. UCTC Project Status as of 7/31/2008**

<b>UCTC</b>	<b>PROJECTS COMPLETED IN 2007-8</b>		
1	<b>An Empirical and Theoretical Study of Freeway Weave Analysis</b>	Michael Cassidy, UC Berkeley	YR 18
2	<b>Freeway Deconstruction and Urban Renewal Land Market and Transportation Impacts</b>	Robert Cervero, UC Berkeley	YR 18
3	<b>How Much Do Low Income and Foreign-Born Households Use Public Transportation?</b>	William Clark, UC Los Angeles	YR 18
4	<b>The Effect of In-Transit WiFi Internet Access on The Value of Travel Time Implications for Mode-Choice Models</b>	Adib Kanafani, UC Berkeley	YR 18
5	<b>Bottom-up Bridge Management System</b>	Samer Madanat, UC Berkeley	YR 18
6	<b>The Political Calculus of Congestion Pricing</b>	Donald Shoup, UC Los Angeles	YR 18
7	<b>Estimating Potential Exposure to Diesel Truck Freeway Emissions in Southern California A Methodology for Assessing Air Pollution Impacts of Goods Movement</b>	Arthur Winer, UC Los Angeles	YR 18
8	<b>An Energy and Emissions Impact Evaluation of Intelligent Speed Adaptation</b>	Matthew Barth, UC Riverside	YR 19
9	<b>Relieving Congestion by Real-time Monitoring of Traffic Conditions and Coordination of Traffic Signals Across Zone Boundaries</b>	Michael Cassidy and Carlos Daganzo, UC Berkeley	YR 19
10	<b>Evaluation of the Information Needs of the Distributed Landside Port Planning in California</b>	Mark Hansen, UC Berkeley	YR 19
11	<b>Subcontracting Decisions in California Highway Procurement Contracts</b>	Amelia Regan, UC Irvine	YR 19
12	<b>Modeling Transportation Networks during Disruption and Emergency Evacuations</b>	Zuo-Jun Max Shen, UC Berkeley	YR 19
13	<b>Mode Choice and Destination Choice: Estimations and Simulations for Airport Access in the San Francisco Bay Area</b>	Kurt Van Dender and David Brownstone, UC Irvine	YR 19
14	<b>Traffic Congestion: Quantifying the Real World Impact on Greenhouse Gases</b>	Matt Barth, UC Riverside	YR 20
15	<b>Securing Linked Transportation Systems - Strategies for Urban transportation</b>	Adib Kanafani, UC Berkeley	YR 20
16	<b>Measuring Travel Behavior of Low-Income Households Using GPS Technologies, Diary and Prompted Recall Methods</b>	Paul Ong, UCLA	YR 20
17	<b>Real Option-based Procurement for Transportation Services</b>	Amelia Regan and JP Saphores, UC Irvine	YR 20
18	<b>Modeling the Reliable Transportation Network Design Problems in Case of Disruptions</b>	Max Shen, UC Berkeley	YR 20

**Table 3 cont.**

<b>UCTC PROJECTS CONTINUING INTO 2008-9</b>			
1	<b>Emission and Air Quality Impacts of New Diesel Engine Control Technologies</b>	Robert Harley, UC Berkeley.	Yr 18
2	<b>Robust Traffic Assignment via Convex Optimization</b>	Laurent El Ghaoui, UC Berkeley	YR 19
3	<b>Drivers in Los Angeles: Profile of a Workforce Facing Change</b>	Jacqueline Leavitt, UCLA	YR 19
4	<b>Subcontracting Decisions in California Highway Procurement Contracts</b>	Justin Marion and Ricard Gil, UC Santa Cruz	YR 19
5	<b>Approach to Real-Time Commercial Vehicle Monitoring</b>	Stephen Ritchie, UC Irvine	YR 19
6	<b>Congestion and Accessibility: What's the Relationship?</b>	Brian Taylor, UCLA	YR 19
7	<b>Immigrants and Travel Behavior: Effect of Ethnic Neighborhoods on Commute Time and Mode</b>	Evelyn Blumenberg, UCLA	YR 20
8	<b>Near Source Modeling of Transportation Emissions in Built Environments Surrounding Major Arterials</b>	Marlon Boarnet, Rufus Edwards, Raul Lejano, and J Wu, UC Irvine	YR 20
9	<b>--companion project by the same name at UCR:</b>	Marko Princevac and Mitch Boretz, UC Riverside	YR 20
10	<b>Are TODs Over-Parked? Exploring Housing, Neighborhood, and Environmental Impacts</b>	Robert Cervero, UC Berkeley	YR 20
11	<b>Microscopic Analysis of Travel Behavior Change</b>	Kostas Goulias, UC Santa Barbara	YR 20
12	<b>The Personal Travel Assistant (PTA): Measuring the Dynamics of Human Behavior</b>	Will Recker, Rina Dechter, and C. Rindt, UC Irvine	YR 20
13	<b>Mitigating the Social and Environmental Impacts of Multimodal Freight Transportation Corridor Operations</b>	Steve Ritchie, R. Jayakrishan, O. Ogunseitan, and R. Torres, UC Irvine	YR 20
14	<b>Costs and Effectiveness of Lower-Speed, Environmentally-Friendly Urban Highway Designs</b>	Ken Small, UC Irvine	YR 20
15	<b>Transportation Decision-Makers, Practitioners, and Researchers: Differences in the Production and Use of Knowledge</b>	Brian Taylor, UCLA	YR 20



## A) PROJECTS COMPLETED IN YEAR 20 (2007-8)

### 1) Year 18 Projects (Awarded 2005-6) Completed in Year 20 (2007-8) – 7 Projects

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

**Principal Investigator:**

Michael Cassidy

UC Berkeley

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

**Abstract:** A major source of freeway bottlenecks is driver lane-changing activity at freeway weaving sections formed when an on-ramp is followed rather closely by an off-ramp. Current methods for analyzing traffic conditions on such sections have shown poor ability to reproduce empirical observations and have produced inconsistent results. This research develops an alternative approach to study weaving phenomena, based on recent empirical and theoretical findings on the mechanisms of driver lane change behavior that cause the reduction in freeway system capacity. We have developed a parsimonious extension to kinematic wave theory (the multilane hybrid model) that reproduces this behavior by explicitly incorporating the effects of lane-changing maneuvers. The method can be used for predicting weaving section capacity. We collect high-fidelity observations at multiple freeway sites to better understand the operations of weaving sections.

**Key Words:** freeway bottlenecks, lane-changing, weaving sections, field experiments, kinematic wave theory

**Objective:** To test a new theory of operation of freeway weaving sections and develop a new method for analysis.

**Tasks:**

1. Literature review: review the state of the art in weaving analysis; document limitations and inconsistencies
2. Data collection: site selection, data collection and processing of at least 3 freeway sites.
3. New method: develop a new method based on the team's recent findings on the connection between lane changes and traffic congestion.
4. Final report.

**Milestones, Dates:** Official start date Aug. 1, 2005, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

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

**Papers to Date:**

Lee, Joon ho, and Michael J. Cassidy. An Empirical and Theoretical Study of Freeway Weave Bottlenecks. 2008, Winter: UCTC Paper # 823

**Conferences Attended to Date:**

WCTR Berkeley, TRB

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

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

### **Principal Investigator:**

Robert Cervero  
UC Berkeley

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

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

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

**Objective:** Evaluate the impacts of freeway demolitions on the land markets and economic standing on affected neighborhoods as well as traffic and safety conditions to gain an understanding of efficiency and equity trade-offs.

**Tasks:** literature review; case studies ; data assembly, matched-pair comparisons on economic development and land markets; before-after analysis of level of service, mode and route shifts, and accident rates; synthesize the findings and prepare report.

**Milestones, Dates:** Official start date Aug. 1, 2005, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

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

### **Papers:**

Cervero, Robert, Junhee Kang, and Kevin Shively. From Elevated Freeways to Surface Boulevards: Neighborhood, Traffic, and Housing Price Impacts in San Francisco. 2008, Winter: UCTC Paper # 836.

### **Conferences Attended:**

WCTR Berkeley, ACSP, TRB

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

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

### **Principal Investigator:**

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UC Los Angeles

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

**Abstract:** Recent research and commentary has raised questions about the use of public transportation by low-income populations. Studies of mostly welfare populations have suggested that while public transportation is not unimportant, the car is a much more critical factor in moving from welfare to work. We use a detailed geo-coded data set to examine the low-income population in general and the foreign born population in particular. We examine how much do low-income households in the Los Angeles metropolitan area use public transportation in their journey to work, schools and other activities, and evaluate whether the foreign-born population are particularly intensive users of public transportation. We consider the relative trade-off of public transit and car use by these households. The study extends previous studies that were targeted to specific welfare populations, considering the low-income population at large.

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

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

**Tasks:** (1) Use logistic regression to estimate the probability of being employed or becoming employed as a function of car versus transit use for individual households, (2) evaluate the use of transit by residential location.

**Milestones, Dates:** Official start date Aug. 1, 2005, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

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

### **Papers:**

William A.V. Clark and Wenfei Winnie Wang (2008) The car, immigrants and poverty: implications for immigrant earnings and job access. Submitted to Urban Geography- revised version being prepared.

### **Conferences Attended:**

WCTR Berkeley, AAG

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

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

### **Principal Investigator:**

Adib Kanafani  
UC Berkeley

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

**Abstract:** This study explores the effect on valuation of passenger travel time (VOTT), of providing of wireless internet access (WiFi) on public transportation modes. Specifically, we aim to formulate a model of the effect of WiFi on trains on time value and eventually on market share. VOTT is the amount that a passenger would pay to reduce travel time by unit quantity. Amenities that enhance possibility of other activities during travel reduce the disutility of travel time, subsequently reducing VOTT. For most work and leisure activities, of internet access during the commute enhances the quality and productivity of work and leisure activities performed during travel.

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

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

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

### **Tasks:**

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

**Milestones, Dates:** Official start date Aug. 1, 2005, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

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

### **Papers:**

Kanafani, Adib, and Jiangchuan Huang. Securing Linked Transportation Systems: Models of Investment to Reduce Vulnerability. 2008, Summer: UCTC Paper # 857.

### **Conferences Attended:**

WCTR Berkeley, TRB

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

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

### **Principal Investigator:**

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

**Abstract:** Infrastructure Management Systems support agencies in developing efficient policies to monitor, maintain, and repair deteriorating facilities. For bridges, two approaches exist: a top-down approach in which optimization is done at the network level, which does not provide bridge-specific recommendations, and a bottom-up approach in which optimization is done first at the facility level. Current systems using a bottom-up approach present a major limitation: the optimization is done on a portion of the life cycle, which is equivalent to a short planning horizon. They also use time-independent deterioration models, which may not be appropriate. A bottom-up Bridge Management System is proposed which would optimize lifecycle maintenance using time-dependent deterioration models and bridge-specific details. Robust optimization techniques can be applied at the facility-level, in order to mitigate the epistemic uncertainty in the deterioration process. Recommendations for each component can be aggregated and selected to meet network-level constraints. The approach will provide long-term maintenance costs savings, and improve long-term performance and mainstreamed maintenance management.

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

**Objective:** A Bridge Management System that accounts for facility-specific attributes and system considerations

### **Tasks:**

1. Literature review on bridge component deterioration models and M&R optimization models
2. Model formulation and solution: problem formulation, deterioration model synthesis, optimization model
3. Extensions: simultaneous optimization of inspection and maintenance decisions (to address inherent uncertainty) and robust optimization (to address epistemic uncertainty).
4. Application case-studies

**Milestones, Dates:** Official start date Aug. 1, 2005, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

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

### **Papers:**

Robelin, Charles-Antoine, and Samer M. Madanat. History-Dependent Optimization of Bridge Maintenance and Replacement Decisions Using Markov Decision Process. 2007, Fall: UCTC Paper # 821.

### **Conferences Attended:**

WCTR Berkeley, TRB

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

## **The Political Calculus of Congestion Pricing**

### **Principal Investigator:**

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UC Los Angeles

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

**Abstract:** Although traffic congestion has worsened and tolling technology has improved, motorists and elected officials continue to oppose congestion tolls on crowded roads. While transportation economists have long recommended tolls as the most promising way to reduce traffic congestion, economic efficiency alone has been insufficient to galvanize public policy. The political viability and public acceptance of congestion pricing depends on creating legitimate claimants who will fight for the revenue, and logical claimants for freeway toll revenue are the cities through which the freeways pass. Distributing toll revenue to freeway cities will compensate these cities for bearing the local external costs of a regional system, and will also create well-organized claimants who support for the tolls. This research explores a new strategy: distributing toll revenue to cities. We estimate the amounts that cities in Los Angeles County would receive, and interview city officials to explore their attitudes towards congestion pricing if the revenues are returned to cities. We also consider applicability to other metro areas.

**Key Words:** congestion, congestion pricing, distribution of toll revenue

**Objective:** To explore how distributing toll revenue to cities can work.

### **Tasks:**

1. Estimate the distribution of toll revenues to cities in Los Angeles County, and interview city officials to explore their attitudes towards congestion pricing if the revenues are returned to cities.
2. Replicate estimates of revenue distribution in other metro areas.
3. Conduct a review of the health implications of freeways on adjacent communities.

**Milestones, Dates:** Official start date Aug. 1, 2005, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** The political viability and public acceptance of congestion pricing depends on creating legitimate claimants who will fight for the revenue, and logical claimants for freeway toll revenue are the cities through which the freeways pass. Distributing toll revenue to freeway cities will compensate these cities for bearing the local external costs of a regional system, and will also create well-organized claimants who support for the tolls.

### **Papers:**

D. King, M. Manville, and D. Shoup. For Whom the Road Tolls: The Politics of Congestion Pricing. Fall 2007: Access 31.

### **Conferences Attended:**

WCTR Berkeley, TRB

**Direct Cost:** \$47,452

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

### **Principal Investigator:**

Arthur Winer  
UC Los Angeles

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

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

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

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

### **Tasks:**

1. Review Existing Studies
2. Collect, Assess and Compile Truck Count Data
3. Assign Truck Counts to a GIS Freeway Map System
4. Identify and Characterize Potential Air Pollution Impacts

**Milestones, Dates:** Official start date Aug. 1, 2005, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

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

### **Papers:**

Houston, Douglas, Margaret Krudysz, and Arthur Winer. Measurements of Diesel Truck Traffic Associated with Goods Movement. 2007, Fall: UCTC Paper # 818.

### **Conferences Attended:**

WCTR Berkeley, TRB

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

## **B) YEAR 19 PROJECTS (AWARDED 2006-7) COMPLETED IN YEAR 20 (2007-8) - 6 PROJECTS**

### **An Energy and Emissions Impact Evaluation of Intelligent Speed Adaptation**

**Principal Investigator:**

Matthew Barth

UC Riverside

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

**Abstract:** Excessive vehicle speed often results in accidents, high fuel consumption rates, and excessive pollutant emissions. Traditional methods of limiting speed have been only moderately effective. Speed enforcement can be enhanced through vehicle Intelligent Speed Adaptation (ISA), which monitors the location and speed of the vehicle, compares it to a set speed, and takes corrective action such as advising the driver and/or governing the vehicle 's speed. ISA also can help smooth traffic flow, reducing fuel consumption and emissions. We evaluate ISA energy and emissions impacts using microscopic transportation/emissions modeling tools and telematic system hardware. We examine different speed management algorithms under varying traffic scenarios. We also experiments using real-time traffic information provided to an ISA-equipped vehicle compared to a non-equipped vehicle.

**Key Words:** dynamic speed control, intelligent transportation systems, energy and vehicle emissions analysis

**Objective:** Evaluate the impacts that intelligent speed adaptation techniques have on vehicle fuel consumption and emissions using both simulation modeling tools and real-world experimentation.

**Tasks:**

Task 1: Literature/data review

Task 2: Simulation Setup and Analysis

Task 3: Conduct Real-World Experimentation

Task 4: Report

**Milestones, Dates:** Official start date Aug. 1, 2006, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** The results from this project allow us to quantify the potential benefits that intelligent speed adaptation will have on energy consumption and pollutant emissions.

**Papers:**

Barth, Matthew, and Kanok Boriboonsomsin , Real-World CO2 Impacts of Traffic Congestion. 2008, Summer: UCTC Paper # 846.

Servin, Oscar, Kanok Boriboonsomsin, and Matthew Barth. An Energy and Emissions Impact Evaluation of Intelligent Speed Adaptation. 2008, Summer: UCTC Paper # 847

**Conferences Attended:**

TRB

**Direct Cost:** \$47,389

## **Relieving Congestion by Real-time Monitoring of Traffic Conditions and Coordination of Traffic Signals across Zone Boundaries**

### **Principal Investigator:**

Michael Cassidy  
Carlos Daganzo  
UC Berkeley

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

**Abstract:** The current paradigm for traffic control relies heavily on forecasting models. Yet the models and data used to produce the outputs are unreliable. A robust strategy has recently been developed to avoid urban gridlock (queue spillovers that cause traffic to devolve to jammed state). The idea behind this strategy consists of dividing a metropolitan area into neighborhood-sized zones; monitoring macroscopic traffic conditions such as aggregate vehicular accumulations within each zone in real time; and controlling flow between zones. We propose to adopt this strategy in the settings of centralized traffic signal control and to develop algorithms that complement those already deployed in systems such as Los Angeles Department of Transportation (LADOT)'s Adaptive Traffic Control System (ATCS). We will develop plans to demonstrate the effectiveness of the strategy through a field test.

**Key Words:** traffic control, signal control.

**Objective:** Relieve congestion by real-time monitoring of traffic conditions and coordination of traffic signals

### **Tasks:**

- Task 1: Obtain and analyze information about ATCS.
- Task 2: Develop new guidelines for partitioning.
- Task 3: Develop aggregation technique to monitor neighborhood level traffic state.
- Task 4: Develop algorithms for implementing proposed strategy in ATCS.
- Task 5: Plan for a field test in ATCS.
- Task 6: Develop policies for coordination and synchronization of traffic signals across jurisdictional boundaries

**Milestones, Dates:** Official start date Aug. 1, 2006, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** Congestion relief and better utilization of transportation system capacities.

### **Papers:**

Lee, Joon ho, and Michael J. Cassidy, An Empirical and Theoretical Study of Freeway Weave Bottlenecks, 2008, Winter: UCTC Paper # 823.

### **Conferences Attended:**

TRB

**Direct Cost:** \$58,658

## Evaluation of the Information Needs of the Distributed Landside Port Planning in California

### Principal Investigator:

Mark Hansen

UC Berkeley

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

**Abstract:** Current landside port transportation plans do not accurately account for movements of truck traffic due to a lack of deep understanding of demand. A sound transportation plan based on the planning decisions of truck operators and public agencies will allow California's ports to grow without degrading the region's transportation system. This research investigates the informational needs of public agencies and private truck operators in planning for landside port operations and puts forth a prototype demand analysis toolkit to provide this information efficiently. It is expected that improved Origin and Destination tables to assist in the Trip Distribution stage of transportation modeling would provide the most benefit to both the public and private sector.

**Key Words:** freight, truck travel, California, landside port, transportation plan, truck operator, public agency, demand analysis

**Objective:** Investigate the distributed processes by which truck operators and port agencies plan for trucking activity in port areas, and initiate development of an analytical toolkit to facilitate and improve such planning.

### Tasks:

Task 1: Evaluate current transportation system service from the perspective of trucks at California container ports.

Task 2: Analyze landside port planning and identify analytical needs related to accommodating trucking activity.

Task 3: Initiate development a prototype methodology for the analysis toolkit identified.

**Milestones, Dates:** Official start date Aug. 1, 2006, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** The toolkit will facilitate the planning decisions of truck operators and public agencies and allow California's ports to grow without undue congestion or environmental degradation.

### Papers:

Smirti, Megan. Modeling and Measuring Greenhouse Gas Reduction from Low Carbon Airport Access Modes. 2008, Summer: UCTC Paper # 854.

Hansen, Mark, Megan Smirti, and Bo Zou. A Comparative Evaluation of Greenhouse Gas Emission Reduction Strategies for the Maritime Shipping and Aviation Sectors. 2008, Summer: UCTC Paper # 855.

Zou, Bo, Megan Smirti, and Mark Hansen. Reducing Freight Greenhouse Gas Emissions in the California Corridor: The Potential of Short Sea Shipping. 2008, Summer: UCTC Paper # 856.

### Conferences Attended:

TRB

**Direct Cost:** \$50,933

## **Models for Evaluating General Truck Transportation Management Strategies**

### **Principal Investigator:**

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

**Abstract:** Increased truck traffic resulting from growth of national and international trade has negative side effects including congestion, safety hazards, air pollution, and rapid pavement deterioration on highways and streets. This research develops a general truck management strategies (GTMS) evaluation model that can concurrently reflect public and private sector standpoints. Microscopic traffic simulation models are employed to examine systems performance measures that can be used to evaluate various GTMS strategies including improving highway characteristics, intelligent transportation systems, operational strategies, and enforcement/compliance.

**Key Words:** Intermodal Freight Transportation System, Capacity Modeling, Truck Management Strategies

**Objective:** To develop an effective and efficient general truck management strategies (GTMS) evaluation model that can concurrently reflect public and private sector standpoints.

### **Tasks:**

Task 1: Comprehensive Literature Surveys for the Prevalent GTMS in the U.S.  
Task 2: Develop a Model For GTMS Evaluation.  
Task 3: Analysis and Evaluation of the GTMS using Micro Simulation.  
Task 4: Write final report.

**Milestones, Dates:** Official start date Aug. 1, 2006, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** This research provides useful planning tools and insight into freight bottlenecks

### **Papers:**

Nandiraju, Srinivas, and Amelia Regan. Freight Transportation Electronic Marketplaces: A Survey of the Industry and Exploration of Important Research Issues. 2008, Winter: UCTC Paper # 832  
Yang, Choon-Heon, and Amelia C. Regan. Impacts of Left Lane Truck Restriction on Urban Freeways. 2008, Winter: UCTC Paper # 833.  
Apivatanagul, Pruttipong "Palm," and Amelia C. Regan. A Solution Algorithm for Long Haul Freight Network Design Using Shipper-Carrier Freight Flow Prediction with Explicit Capacity Constraints. 2008, Winter: UCTC Paper # 834.

### **Conferences Attended:**

TRB, INFORMS

**Direct Cost:** \$63,060

## **Modeling Transportation Networks during Disruption and Emergency Evacuations**

### **Principal Investigator:**

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**Abstract:** Emergency management has attracted a lot of research attention because of the importance as well as the complexity of the problem. Well-prepared transportation systems should be able to respond to natural and human-caused disasters in a timely and effective manner, and ensure the ability to move people and goods in times of crisis. We model the highly uncertain and time-dependent transportation networks during disruptions and emergency evacuations, and propose efficient optimization algorithms to solve the resulting problems. Two types of optimization models are investigated: The first focuses on scenario analysis using risk management tools, and the second deals with dynamic real-time decision making during actual evacuations. Results from this project can help planners make quick and good decisions during evacuations.

**Key Words:** evacuations, optimization, risk management.

**Objective:** To provide optimization tools for the modeling of transportation networks during disruptions and emergency evacuations.

### **Tasks:**

Task 1: Build optimizations models for scenarios analysis and dynamic decision making.

Task 2: Write final report.

**Milestones, Dates:** Official start date Aug. 1, 2006, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** The results from this research can help the planners making quick and good decisions during evacuations to save more lives and reduce the negative impacts of the disasters.

### **Papers:**

Shen, Zuo-Jun Max, Jyothsna Pannala, Rohit Rai, and Tsz Shing Tsoi. Modeling Transportation Networks During Disruptions and Emergency Evacuations. 2008, Summer: UCTC Paper # 853.

### **Conferences Attended:**

TRB

**Direct Cost:** \$70,526

**Mode Choice and Destination Choice: Estimations and Simulations for Airport Access in the San Francisco Bay Area, 2001/2002**

**Principal Investigator:**

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

**Abstract:** We model and estimate how air passengers flying out of a San Francisco Bay Area airport choose a particular airport (as passengers often can travel to the same final destination from several Bay Area airports) and how they choose a transport mode for accessing the airport from their initial travel origin. The estimation uses data from the Bay Area Airline Passenger Survey and a range of auxiliary sources, which in combination provide a detailed picture of the choice alternatives that are available to consumers with different trip origins and trip destinations, and of the time and money costs of these alternatives. In addition, the survey contains a number of useful socio-demographic variables. The estimated model can be used to simulate the effects of changes in airport access costs on airport market shares and on access modes' shares.

**Key Words:** urban transport, mode choice, discrete choice, mixed legit, multiple imputations, airport choice.

**Objective:** To estimate a model of airport choice and mode choice for access to the airport using data on passengers departing from the San Francisco Bay area in 2001/02.

**Tasks:**

- Task 1: Construct a dataset for estimation of the choice model
- Task 2: Econometric implementation of a mixed legit discrete choice model, with multiple imputation methods to account for measurement error.
- Task 3: Simulation of counterfactual scenarios (policy analysis).
- Task 4: Reporting.

**Milestones, Dates:** Official start date Aug. 1, 2006, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** To show how airport and airline decisions affect passenger choices and the ensuing demand for ground transportation, in a region served by competing airports.

**Papers:**

Ishii, Jun, Kurt Van Dender, and Sunyoung Jun. Airport choice and airline choice in the market for air travel between the San Francisco Bay Area and greater Los Angeles in 1995. 2005, Fall: UCTC # 751

**Conferences Attended:**

TRB

**Direct Cost:** \$74,489

### 3) YEAR 20 PROJECTS (AWARDED 2007-8) COMPLETED IN YEAR 20 (2007-8) - 5 PROJECTS

#### Traffic Congestion: Quantifying the Real World Impact on Greenhouse Gases

**Principal Investigator:**

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

**Abstract:** A great deal of attention is now being applied to greenhouse gas emissions (primarily CO<sub>2</sub>) as a major contributor to global climate change. It is estimated that transportation as a whole accounts for 33% of U.S. CO<sub>2</sub> emissions, of which 80% are from cars and trucks traveling on our roadway system. Policy makers are pushing for more efficient vehicles as well as alternative fuels to help reduce CO<sub>2</sub>. However, less attention has been placed on reducing traffic congestion as another means of CO<sub>2</sub> mitigation. Using a large vehicle activity data set and a suite of modeling tools, this study investigates the impacts traffic congestion has on greenhouse gas emissions. The vehicle activity data are stratified by different roadway facility types and different levels of service (LOS); vehicle activity patterns are applied to the emission models, providing greenhouse gas estimates. These results can be used to quantify the CO<sub>2</sub> impacts of various congestion mitigation programs.

**Key Words:** greenhouse gas emissions, traffic congestion, energy, and vehicle emissions impact analysis

**Objective:** The overall research objective is to accurately estimate traffic congestion impacts on greenhouse gas emissions and to evaluate different congestion mitigation programs.

**Tasks:**

Task 1: Collecting and Organizing Vehicle Activity Data;

Task 2: Emissions Modeling;

Task 3: Developing Relationships between Traffic Congestion and CO<sub>2</sub> Emission;

Task 4: Scenario Analysis;

Task 5: Reporting.

**Milestones, Dates:** Official start date August 1, 2007, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** Policy makers will have accurate estimates of greenhouse gas emissions from traffic congestion, allowing them to prioritize congestion mitigation and related programs.

**Papers:**

Barth, Matthew, and Kanok Boriboonsomsin. Real-World CO<sub>2</sub> Impacts of Traffic Congestion. 2008, Summer: UCTC Paper # 846.

Servin, Oscar, Kanok Boriboonsomsin, and Matthew Barth An Energy and Emissions Impact Evaluation of Intelligent Speed Adaptation. 2008, Summer: UCTC Paper # 847.

Boriboonsomsin, Kanok, Oscar Servin, and Matthew Barth. Selection of Control Speeds in Dynamic Intelligent Speed Adaptation System: A Preliminary Analysis. 2008, Summer: UCTC Paper #848.

**Conferences Attended:**

TRB, PATH-UTC conference

**Direct Cost:** \$41,510

## Securing Linked Transportation Systems - Strategies for Urban Transportation

### Principal Investigator:

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

**Abstract:** Literature on reliability and security economics suggests that when security is determined by the weakest link in an interlinked system, then its level is determined by the agent with the lowest benefit-cost ratio, and the other agents have the tendency to under-invest or free ride. When security is a function of total effort, then the opposite obtains and the reliability will depend on the agent with the highest benefit-cost ratio. These conditions arise in urban transportation. For example, a transit system represents a weakest link reliability system when considering the stations as points of vulnerability. An airport access system where controls are repeated over numerous stages is a total effort system. This research builds models of security for interlinked urban transportation systems and develops guidelines for investments in security. The question it addresses is: is it preferable to let each agency operate its own security budget and make its own investment decisions or is this process better centralized?

**Key Words:** transportation security, investment decision-making, economics of security.

**Objective:** Develop investment strategies for securing urban transportation systems.

### Tasks:

Task 1: Literature Search.  
Task 2: Taxonomy of Vulnerabilities.  
Task 3: Models of Security Performance.  
Task 4: Policy Recommendations.

**Milestones, Dates:** Official start date August 1, 2007, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** Guidelines for integrating security into the transportation planning process.

### Papers:

Kanafani, Adib, and Jiangchuan Huang. Securing Linked Transportation Systems: Models of Investment to Reduce Vulnerability. 2008, Summer: UCTC Paper # 857.

### Conferences Attended:

TRB

**Direct Cost:** \$54,179

## **Measuring Travel Behavior of Low-Income Households Using GPS-Enabled Cell Phones; Multimodal Monitoring with Integrated GPS, Diary and Prompted Recall Methods**

### **Principal Investigator:**

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

**Abstract:** This research demonstrates innovative methods for using GPS-enabled cell phones to measure, analyze, and verify highly resolved travel patterns of low-income households for multiple modes and days. The travel of low-income households varies significantly from more affluent households, but our understanding of how low-income residents navigate the urban landscape throughout the day has been limited since they are less likely to respond to travel surveys and, when they participate, are more likely to underreport travel. The project addresses these limitations through targeted sampling and the integration of traditional travel diary methods with portable GPS monitoring and follow-up prompted recall interviews to verify patterns revealed in simultaneous diary-GPS monitoring. Respondents are residents of Wilmington and western Long Beach, CA, port-adjacent low-income communities impacted by high levels of congestion and pollution due to goods movement activities. Results provide valuable insights into the travel of low-income households and generate data to support improvements to travel and air pollution exposure models.

**Key Words:** travel patterns, low-income households, portable GPS monitoring, travel diary, prompted recall.

**Objective:** To demonstrate innovative methods for using GPS-enabled cell phones with traditional travel diaries and prompted recall methods to measure, analyze, and verify highly resolved travel patterns of low-income households for multiple modes and days.

### **Tasks:**

Task 1: Study design and pilot testing;  
Task 2: Participant recruitment training and monitoring;  
Task 3: Post-processing and analysis.

**Milestones, Dates:** Official start date August 1, 2007, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** The project will provide refined insights on travel behavior of low-income households for transportation policy and models and will support improvements for using portable devices for travel monitoring for multiple modes and days.

### **Papers:**

Ong, Paul, and Cheol-Ho Lee. Spatial Pattern of Vehicle Ownership by Vintage, 2008, Winter: UCTC Paper # 835.

(additional papers under review)

### **Conferences Attended:**

TRB

**Direct Cost:** \$58,894

## **Real Option-based Procurement for Transportation Services**

### **Principal Investigator:**

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

**Abstract:** This research investigates how to model freight transportation flexibility using the theory of real options (Dixit and Pindyck, 1994). In the practice of adopting lean and demand-responsive logistics systems, orders are required to be delivered rapidly, accurately and reliably, even under demand uncertainty. These tougher demands on the industry motivate the need to introduce new instruments to manage transportation service contracts. One possibility, which has begun to attract attention, is to use real options to hedge transportation capacity and cost volatility. To date, no published research has specifically focused on applying real options in the trucking industry even though this is the dominant freight transportation mode. Our research proposes a real option based method of procuring trucking services. Research activities will include: 1) understanding the conditions for the emergence of a market for truckload options based on experiences in other transportation industries; 2) modeling truckload rate dynamics and investigating pricing formulas for truckload options; and 3) collecting data and case studies for selected representative transportation origin-destination pairs.

**Key Words:** freight transportation flexibility, value at risk, real option, trucking contracting.

**Objective:** To model freight transportation contract flexibility in the trucking industry using the theory of real options with an emphasis on capacity options.

### **Tasks:**

Task 1: Literature review.

Task 2: Pricing model development: modeling TL rate dynamics and investigating pricing formula for TL options for different types of options.

Task 3: Data collection: purchased data from service providers, collected data from the literature, quotes from trucking companies or trucking associations.

Task 4: Case Studies: Apply the developed pricing model to selected lanes as case studies and analyze the effects of TL options on shippers and carriers.

Task 5: Report writing and paper writing.

**Milestones, Dates:** Official start date August 1, 2007, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** This research helps to create value from uncertainty, including price and demand uncertainty, through trucking options contracts, which are new to the trucking industry.

### **Papers:**

Song, Jiongjong, Amelia C. Regan, and Srinivas Nandiraju. A Bid Analysis Model with Business Constraints for Transportation Procurement Auctions. 2008, Winter: UCTC Paper # 841.

### **Conferences Attended:**

TRB

**Direct Cost:** \$107,398

## **Modeling the Reliable Transportation Network Design Problems in Case of Disruptions**

### **Principal Investigator:**

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

**Abstract:** Classic transportation network design models usually assume that once constructed, the network facilities (e.g., hubs) will always work as expected. In reality, however, these facilities can fail from time to time due to natural disasters, labor actions, terrorist attacks and other factors. Such failures may lead to excessive transportation cost as some customers must be re-routed to other facilities that are further than their regularly assigned ones. We plan to develop mathematical programming models for transportation network design to minimize cost, while also taking into account the expected transportation cost after failures of facilities. Possible results from this project can help the planners to make transportation network design decisions that are both reliable and cost effective.

**Key Words:** disruption, optimization, reliability.

**Objective:** To provide optimization tools for the design of reliable and efficient transportation networks.

### **Tasks:**

Task 1: Literature review;

Task 2: Problem formulation;

Task 3: Solution algorithm development;

Task 4: Final report.

**Milestones, Dates:** Official start date August 1, 2007, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** The research provides guidelines for planners to make transportation network design decisions that balance the trade-off between the routine operating cost and the failure cost, and that between the operating cost and the service level.

### **Papers:**

Shen, Zuo-Jun Max, Jyothsna Pannala, Rohit Rai, and Tsz Shing Tsoi Modeling Transportation Networks During Disruptions and Emergency Evacuations. 2008, Summer: UCCTC Paper # 853.

### **Conferences Attended:**

TRB

**Direct Cost:** \$55,210

## **B) PROJECTS CONTINUING IN YEAR 21 (2008-9) – 15 PROJECTS**

### **1) YEAR 18 PROJECTS CONTINUING IN YEAR 21 – 1 PROJECT**

#### **Emission and Air Quality Impacts of New Diesel Engine Control Technologies (YEAR 18)**

**Principal Investigator:**

Robert Harley

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

**Abstract:** Diesel engines are now responsible for half or more of the total nitrogen oxide (NO<sub>x</sub>) and exhaust particulate matter (PM) emissions from on-road vehicles nationally. There has been recent progress in developing control technologies such as selective catalytic reduction, lean NO<sub>x</sub> traps, NO<sub>x</sub> storage catalysts, and diesel particulate filters. Although these technologies have not yet been widely deployed in on-road vehicles, their use will soon be required due to new heavy-duty engine emissions standards that will take effect in the U.S. starting with the 2007 model year. In this research, we will review control technologies available for future use, assess control efficiency, cost, durability and robustness in service, and the potential for undesirable side-effects on exhaust emissions. Emissions estimates will be developed for historical, current and future year scenarios that span a 20-year time period. We will use a 3-D photochemical model to predict the effects of changes in vehicle emissions on air pollution levels in the Los Angeles area.

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

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

**Tasks:**

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

**Milestones, Dates:** Official start date Aug. 1, 2005, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

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

**Papers to Date:**

None

**Conferences Attended to Date:**

WCTR Berkeley

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

## 2) YEAR 19 PROJECTS CONTINUING IN YEAR 21 – 5 PROJECTS

### Robust Traffic Assignment via Convex Optimization (YEAR 19)

**Principal Investigator:**

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

**Abstract:** The static traffic assignment problem with deterministic demand is often formulated as a linear, or, more generally, convex optimization problem. It has long been recognized that various uncertainties in origin-destination demands or network topology may affect the input data and in turn, may greatly deteriorate the optimality of traffic assignment solutions. Robust optimization refers to new approaches to optimization under uncertainty. This project evaluates the potential benefits of using a robust optimization approach in the context of traffic assignment, both for static and dynamic problems. The objective is a traffic assignment methodology that provides solutions that are far more robust than the original ones, yet give up relatively little in terms of performance.

**Key Words:** traffic assignment, convex optimization, uncertainties, robust optimization, performance

**Objective:** Development of a traffic assignment methodology that combines the efficiency of convex optimization algorithms and versatility of robust optimization models, offering robust solutions at little extra cost in performance.

**Tasks:**

Task 1: Literature review and impact assessment

Task 2: Static assignment, bounded uncertainty: development of models for extreme situations which catastrophically disrupt the network.

Task 3: Static assignment, stochastic uncertainty: uncertainty modeled via random variables, with imperfectly known distributions.

Task 4: Dynamic assignment: formulate efficient robust optimization algorithms for the dynamic case, with focus on so-called linear recourse strategies, in the context of highly disruptive perturbations.

**Milestones, Dates:** Official start date Aug. 1, 2006, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** The product of the project will enable analysts to obtain solutions to traffic assignment problems that offer greater reliability, and behave better even in the case of large-scale, catastrophic perturbations.

**Papers to Date:**

None

**Conferences Attended to Date:**

None

**Direct Cost:** \$70,240

## **Taxi Drivers in Los Angeles: Profile of a Workforce Facing Change (YEAR 19)**

### **Principal Investigator:**

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**Abstract:** Little is known about taxi drivers in the City of Los Angeles. In general, taxi drivers work long hours, without health insurance, for low wages. Nine taxi operators with a total of 2,303 cars have franchises each of which is assigned to one or more service areas. The L.A. taxi workforce is increasingly immigrant. Data about drivers conflates taxi and limousine drivers. Diversity by ownership or lease is not clearly defined; drivers include owner-operators, who may own multiple cabs and lease drivers who pay rent to an owner or fleet. Highly regulated, relationships with government bureaucracies and franchises determine fees and expenses including weekly leases, car payments, insurance, maintenance, etc. This study focuses on characteristics of taxi drivers -- demographics, income, health coverage, stress levels, and impacts on households – and the structure of their relationships with taxi companies. Findings are based on a survey of 400 taxi drivers and in-depth interviews of 30 taxi drivers. The findings will help the L.A. City Council evaluate a proposal by taxi operators to shift to medallions as franchises expire in 2010. Findings will clarify consequences for change in an industry whose workforce profile is changing.

**Key Words:** taxi drivers, City of Los Angeles, health insurance, low wages, immigrant, owner-operators, lease drivers, survey, in-depth interview, medallions

**Objective:** Develop a socio-economic profile of taxi drivers in Los Angeles, including working conditions, income, years of driving, health coverage, national origin and impact on economic support of households.

### **Tasks:**

Task 1: Administer 400 surveys to taxi drivers in the City of Los Angeles.

Task 2: Conduct 30 in-depth interviews.

Task 3: Data entry and analysis.

Task 4: Review secondary literature.

Task 5: Draw from current research studies on network and sectoral analyses of taxi industry in LA

**Milestones, Dates:** Official start date Aug. 1, 2006, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** Provide a taxi driver needs assessment at a time when the City Council will face expiring taxi operator franchises and taxi industry is circulating a proposal to adopt a medallion system.

### **Papers to Date:**

None

### **Conferences Attended to Date:**

None

**Direct Cost:** \$35,029

## **Subcontracting Decisions in California Highway Procurement Contracts (YEAR 19)**

### **Principal Investigator:**

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**Abstract:** Theories of the firm suggest that problems such as contractual incompleteness and hold-ups lead firms to produce inputs in-house rather than purchasing them from potentially more efficient suppliers. Repeated interactions between firms and their suppliers are often thought to relieve such problems, as the risk of putting in jeopardy future business opportunities often outweighs the short-run gains from providing suboptimal levels of non-contractible output or holding up production to capture more rents. This research empirically examines the role of relationships, in the form of repeat interactions, between contractors and subcontractors in the California state highway procurement market. Data from auctions awarding highway construction and repair contracts will be used to assess several questions. First, what determines relationship formation? Second, how do such relationships improve firm productivity? Third, how do these relationships lead to improved performance after the contract is awarded? These results will be discussed in the context of Caltrans policies, such as affirmative action programs.

**Key Words:** Highway procurement, subcontracting, relational contracting.

**Objective:** The goal of this research is to provide insight into relationships between contractors and subcontractors, including factors influencing their formation, and how they affect firm efficiency and performance.

### **Tasks:**

Task 1: Collect data on prices charged for items within contracts, and the actual value of subcontractor payments  
Task 2: Data management including creating tracking variables for subcontractors across projects, generating contractor-subcontractor relationship measures, and generating geocoded firm locations and distance measures.

Task 3: Statistical and economic analysis, including estimating determinants of relationship formation, how relationships impact firm costs, and how relationships affect project performance.

Task 4: Write final report.

**Milestones, Dates:** Official start date Aug. 1, 2006, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** Better understanding of the impact of current and future policies relating to subcontracting, an important component of the production decision of highway construction firms.

### **Papers to Date:**

None

### **Conferences Attended to Date:**

None

**Direct Cost:** \$58,641

## **Approach to Real-Time Commercial Vehicle Monitoring (YEAR 19)**

### **Principal Investigator:**

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

**Abstract:** Vehicle classification algorithms allocate vehicles to predefined classes based on selected vehicle characteristics. Such algorithms have important applications in travel forecasting, goods movement studies, road design and maintenance, traffic flow modeling, and more. We will collect a large and unique dataset of commercial vehicle (CV) signatures using conventional inductive loops and a new wireless sensor with potential for cost-effective and widespread use. The data will be used to develop detailed, accurate vehicle classification algorithms for CVs, and will provide important insights into the strengths and limitations of a new wireless traffic sensor.

**Key Words:** vehicle classification, algorithms, commercial vehicles, inductive loops, wireless traffic sensor,

**Objective:** Collect a dataset of commercial vehicle signatures and development accurate and detailed commercial vehicle classification algorithms, utilizing a new traffic sensor

### **Tasks:**

Task 1: Design of data collection setup, and assemble equipment.

Task 2: Collect signature data and video data at both locations.

Task 3: Investigate signature preprocessing requirements for Sensys data.

Task 4: Ground truth vehicle signature data.

Task 5: Investigate feature correlation and error analysis for vehicles belonging to similar classes for both loop and Sensys data.

Task 6: Develop vehicle classification algorithm for Sensys data.

Task 7: Develop improved vehicle classification algorithm for loop data.

Task 8: Recommendations for potential of loop and Sensys sensors for vehicle classification applications.

Task 9: Develop commercial vehicle re-identification model for Sensys to Sensys and loop to Sensys sensors.

Task 10: Final Summary Report.

**Milestones, Dates:** Official start date Aug. 1, 2006, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** New insights into the structure and formulation of improved vehicle classification algorithms for commercial vehicles, and development of more accurate and detailed vehicle classification algorithms

### **Papers to Date:**

None

### **Conferences Attended to Date:**

None

**Direct Cost:** \$57,349

## **Congestion and Accessibility: What's the Relationship? (YEAR 19)**

### **Principal Investigator:**

Brian Taylor  
UC Los Angeles

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

**Abstract:** This research examines how measures of transportation accessibility and congestion vary and relate in metropolitan areas. While congestion has been a perennial concern for transportation policymakers, planners, and researchers, traditional measures of congestion say little about the range and extent of opportunities that individuals are either gaining access to or missing out on because of the regional transportation system's functionality. Using GIS-based methods, empirical measures of accessibility will be developed that account both for mobility constraints at a given location and the potential destinations accessible within those constraints. These measures of accessibility will be compared to common measures of congestion at the local and regional scales. We hypothesize that the effects of congestion on accessibility are likely to vary considerably across a single region. Because of these differences, empirical measures of accessibility may provide different insights into the transportation system's performance by emphasizing potential benefits for travelers rather than the mechanistic functioning of the infrastructure. This research seeks to shift the unit of analysis in congestion measurement from the transportation network to travelers by focusing on accessibility instead of system performance.

**Key Words:** congestion, accessibility, GIS.

**Objective:** Determine how measures of transportation accessibility and congestion vary and relate in metropolitan areas.

### **Tasks:**

- Task 1: Literature review.
- Task 2: Develop congestion measures.
- Task 3: Develop accessibility measures.
- Task 4: Congestion / accessibility comparative analysis.
- Task 5: Final report.

**Milestones, Dates:** Official start date Aug. 1, 2006, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** This research will contribute to our understanding of how congestion relates to individuals' access to destinations (or the inverse, spatial isolation).

### **Papers to Date:**

None

### **Conferences Attended to Date:**

None

**Direct Cost:** \$22,730

### 3) YEAR 20 (2007-8) PROJECTS CONTINUING INTO YEAR 21 (2008-9)– NINE PROJECTS

#### **Immigrants and Travel Behavior: Effect of Ethnic Neighborhoods on Commute Time and Mode (Year 20)**

**Principal Investigator:**

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

**Abstract:** Immigrants comprise a large and growing percentage of the population yet we know very little about their travel patterns particularly as they relate to residential location. This study, therefore, examines the travel of immigrants focusing on the relationship between immigrant enclaves and travel behavior. More specifically, the study relies on census tract and micro data from the U.S. Census to test whether immigrants living in ethnic neighborhoods travel shorter distances and are more likely to use alternative travel modes (carpool, transit, walk) than other immigrants. The findings from this study will help us better understand the travel of immigrants. Moreover, they will have implications for understanding the impact of land use on travel behavior and provide insight into the relative roles of acculturation, residential location, and economic status in shaping outcomes for immigrant families.

**Key Words:** demographics, travel behavior, immigrants, ethnic neighborhoods.

**Objective:** Examine the travel behavior of immigrants in Los Angeles and New York focusing particularly on the relationship between immigrant neighborhoods and commute mode and time.

**Tasks:**

Task 1: Apply for use of confidential census-tract identifiers for the Los Angeles and New York Public Use Microdata Samples;

Task 2: Identify major ethnic enclaves in Los Angeles and New York using census-tract level data;

Task 3: Analyze the aggregate, census-tract-level data;

Task 4: Link the Public Use Microdata to the census-tract level; we will attach a geographic identifier to each individual that identifies whether they reside in an ethnic neighborhood;

Task 5: Use the micro-data to analyze the travel behavior (commute mode choice and commute travel time) of immigrants, focusing on the role of ethnic enclaves in predicting each outcome measures;

Task 6: Prepare journal articles and present findings.

**Milestones, Dates:** Official start date August 1, 2007, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** The proposed study will help us to better understand the mobility of a particular group of people – immigrants. Further, the study will have implications for understanding the impact of land use on travel behavior. Urban planners have been promoting mixed-use developments as one component of a broader sustainable development strategy. If home-work distances in immigrant enclaves are shorter than in other neighborhoods, ethnic enclaves may serve as a model for successful and sustainable urban development. Finally, the study will also provide insight into the relative roles of acculturation, residential location, and economic status in shaping outcomes for immigrant families.

**Direct Cost:** \$53,371

## Near Source Modeling of Transportation Emissions in Built Environments Surrounding Major Arterials (Year 20)

### Principal Investigators:

Marlon Boarnet and Rufus Edwards  
UC Irvine

### Email:

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

**Abstract:** Though much of the research on the environmental health effects of vehicular emissions has been around freeways, there is reason to suspect arterials as a major source of risk. Especially considering present-day trends of infill development, patterns of built form around arterials may trap elevated concentrations of air pollutants (e.g., street canyons created by multi-storey condominiums and office buildings) in close proximity to residences. Bringing together expertise in transportation and land use planning and environmental modeling, the research team proposes an unprecedented analysis of the environmental impacts of major arterials. Using a fine-scale wind field and dispersion model (Quick Urban and Industrial Complex), the team will simulate the transport of vehicular particulates (1 and 2.5 micron diameter) around five heavily-traveled Southern California arterials chosen to correspond to five land use types. The model is able to account for the effects of the micro-environment (i.e., built form and other infrastructure) on pollutant transport. The field-calibrated model will then be used to simulate the effects of: (i) alternative land development strategies (e.g., varying building height and setback requirements, infill patterns, zoning) and (ii) alternative transport policies (e.g., idling time reduction, stoplight synchronization, truck traffic scheduling and rerouting). The research will enable us to assess the urgency of incorporating arterials into the environmental planning programs of resource, land use, and transportation agencies, and will provide a method for doing so.

**Key Words:** particulate emissions, transportation, health impacts, arterials.

**Objective:** We will develop, field test, and apply a modeling method for understanding how traffic patterns and the built environment concentrate fine particulates (PM1.0) on a block-by-block basis near major arterials within urban areas, and provide policy recommendations based on the insights from the modeling method.

### Tasks:

- Task 1: Select five arterials (cases);
- Task 2: Quick Urban and Industrial Complex (QUIC) computer model setup and representations of the cases' built environment
- Task 3: QUIC model runs;
- Task 4: Fluid chamber setup including representation of built environment from five selected arterials;
- Task 5: Caline4 model setup for background emissions modeling;
- Task 6: Caline4 runs;
- Task 7: QUIC-Caline integrations for computer simulation of particulate dispersion near five arterials;
- Task 8: Field measurements of particulate concentrations at five arterials;
- Task 9: QUIC model validation: comparison of laboratory (fluid chamber) and field measurements with initial QUIC model runs;
- Task 10: validated (and re-calibrated) QUIC model runs;
- Task 11: Policy simulations;
- Task 12: Report writing.

**Milestones, Dates:** Official start date August 1, 2007, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** This research will examine an overlooked source of transportation-related health risk, fine particulate emissions along major arterials, developing a modeling method and examining land use and policy implications that will give insight into how development patterns and transportation policies can be adapted to reduce particulate concentrations that might otherwise arise as urban areas grow denser.

**Direct Cost:** \$113,540

## Are TODs Over-Parked? Exploring Housing, Neighborhood, and Environmental Impacts (Year 20)

### Principal Investigator:

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

**Abstract:** Recent studies on car ownership levels and vehicle trip generation rates suggest that many large-scale housing projects near urban rail stations are “over-parked” – more parking is provided than is needed. This can drive up the cost of housing, consume valuable land near transit stops, and impose such environmental costs as increased impervious surface area. Part of the blame for the over-supply of parking in transit-oriented developments (TODs) could be the reliance on ITE parking generation figures. This research compares actual parking demand with parking supplies and ITE rates for 20 large-scale multi-family housing projects in four rail-served metropolitan areas: Portland, San Diego, San Francisco, and Washington, D.C. The impacts of over-supplying parking on housing affordability, project profitability, land consumption, environmental pollution, travel demand, and other areas will be explored. This will be supplemented by case studies on the evolution of zoning and building codes in TODs, including their rationales, institutional and political contexts, influences on TOD planning and designs, and views of local residents. Based on both quantitative and qualitative results, possibilities for various reforms – such as transit eco-pass substitutions, unbundling parking and housing provisions/costing, flexible parking codes, and near-site carsharing – will be examined.

**Key Words:** Transit-oriented development; parking supplies; housing affordability; zoning standards; environmental impacts

**Objective:** Clarify the potential full-range of costs of excessive parking requirements of U.S. TODs with an eye toward promoting reforms, such as flexible parking codes and provisions of eco-pass options.

### Tasks:

- Task 1: Review literature;
- Task 2: Measure parking generation rates for 20 transit-based housing projects;
- Task 3: Compare rates to parking supplies and *ITE* parking generation rates;
- Task 4: Using secondary data sources, estimate impacts on housing affordability, development profitability, land consumption, impervious surface area (and impacts on water quality and heat island effects), land-use separation, and walking/travel activities;
- Task 5: Conduct case studies on the evolution of parking codes and standards for TODs in two metropolitan areas;
- Task 6: Interview planners, developers, and residents about their views on parking policies in TODs as well as their receptivity to in-lieu programs (like transit pass substitutions) and other reforms (like carsharing).
- Task 7: Prepare working paper report; publish and present peer-reviewed articles.

**Milestones, Dates:** Official start date August 1, 2007, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** Lower housing costs, higher ridership, reduced land consumption, and environmental/energy savings due to aligning parking supplies more closely with market demand.

**Direct Cost:** \$59,543

## **Microscopic Analysis of Travel Behavior Change (Year 20)**

### **Principal Investigator:**

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

**Abstract:** This project examines person and household behavioral histories over a long period (1989 to 2003) offering a unique opportunity to differentiate individual variation in behavior due to age, period, and cohort membership as well as other person-specific changes (e.g., entry to and exit from the labor force) and household changes (e.g., entry or exist of household members). Second, it offers a new approach of studying within-household dynamics and the impact events of within-household change have on individual as well as household behavior using latent variables. Third, the substantive analysis of travel behavior offers a comprehensive analysis of human and social (household) behavior in time and space. The most important analytical method in this project is a set of latent variable structural equations models longitudinal data to build trajectories of behavioral change.

**Key Words:** within-household dynamics, structural equations model, longitudinal data.

**Objective:** Create a model system that explains travel behavior as a function of change in social and demographic factors and other contextual circumstances.

### **Tasks:**

Task 1: Data Assembly;  
Task 2: Data Analysis;  
Task 3: Write Report and Papers for Publication.

**Milestones, Dates:** Official start date August 1, 2007, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** Achieve better understanding of travel behavior to design better travel demand forecasting tools.

**Direct Cost:** \$56,843

**Near Source Modeling of Transportation Emissions in Built Environments Surrounding Major Arterials (Year 20)**  
(companion project to Boarnet et al.)

**Principal Investigators:**

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

**Abstract:** Though much of the research on the environmental health effects of vehicular emissions has been around freeways, there is reason to suspect arterials as a major source of risk. Especially considering present-day trends of infill development, patterns of built form around arterials may trap elevated concentrations of air pollutants (e.g., street canyons created by multi-storey condominiums and office buildings) in close proximity to residences. Bringing together expertise in transportation and land use planning and environmental modeling, the research team proposes an unprecedented analysis of the environmental impacts of major arterials. Using a fine-scale wind field and dispersion model (Quick Urban and Industrial Complex), the team will simulate the transport of vehicular particulates (1 and 2.5 micron diameter) around five heavily-traveled Southern California arterials chosen to correspond to five land use types. The model is able to account for the effects of the micro-environment (i.e., built form and other infrastructure) on pollutant transport. The field-calibrated model will then be used to simulate the effects of: (i) alternative land development strategies (e.g., varying building height and setback requirements, infill patterns, zoning) and (ii) alternative transport policies (e.g., idling time reduction, stoplight synchronization, truck traffic scheduling and rerouting). The research will enable us to assess the urgency of incorporating arterials into the environmental planning programs of resource, land use, and transportation agencies, and will provide a method for doing so.

**Key Words:** particulate emissions, transportation, health impacts, arterials

**Objective:** We will develop, field test, and apply a modeling method for understanding how traffic patterns and the built environment concentrate fine particulates (PM1.0) on a block-by-block basis near major arterials within urban areas, and provide policy recommendations based on the insights from the modeling method.

**Tasks:**

Task 1: Select five arterials;

Task 2: Quick Urban and Industrial Complex (QUIC) computer model setup, including representations of the built environment from five selected arterials;

Task 3: QUIC model runs;

Task 4: Fluid chamber setup including representation of built environment from five selected arterials;

Task 5: Caline4 model setup for background emissions modeling;

Task 6: Caline4 runs;

Task 7: QUIC-Caline integrations for computer simulation of particulate dispersion near five arterials;

Task 8: Field measurements of particulate concentrations at five arterials;

Task 9: QUIC model validation: comparison of laboratory (fluid chamber) and field measurements with initial QUIC model runs;

Task 10: validated (and re-calibrated) QUIC model runs;

Task 11: Policy simulations;

Task 12: Report writing.

**Milestones, Dates:** Official start date August 1, 2007, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** Better understanding of the health risk of fine particulate emissions along major arterials, with a modeling method for examining land use policy implications.

**Direct Cost:** \$57,376

## **The Personal Travel Assistant (PTA): Measuring the Dynamics of Human Behavior (Year 20)**

### **Principal Investigator:**

Will Recker and Rina Dechter  
UC Irvine

### **Email:**

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

**Abstract:** The fundamental research question that will be addressed with the project is whether a simple, continuously collected GPS sequence can be used to accurately measure human behavior. Our proposed research builds upon a personal information device (PTA, Personal Travel Assistant) that we have been developing (in a separate project) that will serve both as a research tool and as a testbed. To learn behaviors given an extended GPS data stream, we propose applying Hybrid Dynamic Mixed Network (HDMN) modeling techniques. We will design and deploy a prototype personal travel assistant system. The working prototype will be deployed for initial testing in the Orange County, California area. In addition to collecting travel information for the initial deployment period, the initial users of the PTA system will be asked questions about their attitudes towards the collection of travel data under various scenarios, and whether they ever used the PTA's built in privacy guards. We will analyze the collected data to develop detailed models of human behavior, and streamline learning and inference using the baseline HDMN model and the collected travel data, as well as implement algorithms for estimating network demands using PTA data.

**Key Words:** Bayesian model, human dynamics, travels information system.

**Objective:** The objective of this research is to develop a real-time longitudinal activity/travel data collection and modeling system that can assist travelers in negotiating unforeseen, detrimental, traffic conditions. A secondary objective is to provide transportation suppliers with a cheap and effective way to measure and predict demand dynamics.

### **Tasks:**

Task 1: We will design and deploy a prototype personal travel assistant system. The working prototype will be deployed for initial testing in the Orange County, California area, ideally recruiting households in the area of UC Irvine's ATMIS testbed to leverage its advanced infrastructure monitoring capabilities;

Task 2: Field survey. In addition to collecting travel information for the initial deployment period, the initial users of the PTA system will be asked questions about their attitudes towards the collection of travel data under various scenarios, and whether they ever used the PTA's built in privacy guards;

Task 3: Analyze longitudinal behavior for individuals and households. Analyze the collected data for developing detailed models of human behavior;

Task 4: Streamline learning and inference using the baseline HDMN model and the collected travel data;

Task 5: Implement algorithms for estimating network demands using PTA data.

**Milestones, Dates:** Official start date August 1, 2007, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** Research about how people use such information and how willing they are to share their own behavior will inform the subsequent development of an aggregate travel demand prediction system that transportation system operators can use to better understand the dynamic demand for transport.

**Direct Cost:** \$63,421

## Mitigating the Social and Environmental Impacts of Multimodal Freight Transportation Corridor Operations (Year 20)

### Principal Investigator:

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

**Abstract:** The San Pedro Bay Ports (SPBP) of Los Angeles and Long Beach in Southern California are one of the major container port complexes in the world: in 2004, for example, the SPBP processed over 36% of the U.S. container trade. However, the SPBP complex is also a major source of air pollution caused largely, on the land-side, by diesel locomotives and trucks that transport containers to and from the ports. The resulting annual health costs may exceed \$2.5 billion. Low income and minority communities along the major Alameda corridor, a 20-mile railroad line that connects the SPBP to the transcontinental rail network east of downtown Los Angeles, are particular affected. This study will create a tool that will quantify links between SPBP freight traffic, air pollution, and the health of local communities. This tool will help evaluate the effectiveness of various alternatives (such as congestion pricing to decrease peak container traffic flows, biofuels for trucks and locomotives, or intermodal and route shifting of container traffic) in order to mitigate the environmental and health impacts of SPBP activities. Expected results include new insights into the spatial, socioeconomic, public health, and social justice consequences of alternative SPBP multimodal freight operations strategies.

**Key Words:** Port, air pollution, air quality, freight, container, corridor, truck, locomotive, simulation, social impact, environmental impact, public health, social justice

**Objective:** This study seeks to create a tool that will shed light on the links between Alameda Corridor freight traffic from the SPBP, air pollution, and the health of local communities, and in so doing help to evaluate the effectiveness of various alternatives (such as congestion pricing, biofuels for trucks and locomotives, and intermodal and route shifting of container traffic) to mitigate the environmental and health impacts of port activities.

### Tasks:

- Task 1: Assemble relevant data and code PARAMICS network;
- Task 2: Select corridor strategies to be simulated;
- Task 3: Run PARAMICS simulations;
- Task 4: Assemble emission factors for road and rail traffic;
- Task 5: Model the dispersion of criteria pollutants in the corridor;
- Task 6: Assemble demographic data and public health impacts;
- Task 7: Assess environmental justice implications for corridor population;
- Task 8: Write final Summary report and academic papers.

**Milestones, Dates:** Official start date August 1, 2007, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** The expected benefits include new insights into the spatial, socioeconomic and public health air quality impacts, and thus social justice consequences, of alternative SPBP freight operations strategies in the Alameda corridor, and development of a tool that will be useful for ongoing policy analyses pertaining to this corridor and which could be adapted and/or expanded for analysis of other corridors and strategies.

**Direct Cost:** \$89,869

## **Costs and Effectiveness of Lower-Speed, Environmentally-Friendly Urban Highway Designs (Year 20)**

### **Principal Investigator:**

Kenneth Small  
UC Irvine

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

**Abstract:** Adding capacity to ameliorate urban road congestion is often thought to be infeasible due to its great expense. This proposal seeks to investigate differentiated design standards as a source of capacity additions that are more affordable and have smaller "footprints," thus smaller aesthetic and environmental impacts. The research will examine the tradeoff between providing capacity for high-speed off-peak travel, when peak travel is severely congested, versus providing more capacity but only for moderate-speed travel. It will also examine the potential savings in cost and footprint from designing certain roads to be for passenger vehicles only. Thus, the research will show under what conditions lower-speed, environmentally-friendly highway designs are cost-effective. The results will provide guidance for metropolitan transportation planning, in particular guidance concerning the emphasis given to different types of highways for handling anticipated traffic growth.

**Key Words:** capacity, congestion, highway design.

**Objective:** Examine conditions under which lower-speed, environmentally-friendly highway designs are cost-effective alternatives to high-speed expressways in crowded urban areas.

### **Tasks:**

- Task 1: Collect data on costs, capacities, and accident experience with alternative high-capacity highway designs;
- Task 2: Compare costs of specific alternative designs providing a given amount of capacity but at different speeds;
- Task 3: Develop an analytical model to measure the total social costs of travel under alternative investment strategies using alternative designs;

**Milestones, Dates:** Official start date August 1, 2007, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** We may uncover possibilities for building substantial additions to capacity at more affordable costs than those envisioned in current metropolitan transportation plans.

**Direct Cost:** \$29,913

**Transportation Decision-Makers, Practitioners, and Researchers: Differences in the Production and Use of Knowledge (Year 20)**

**Principal Investigator:**

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UC Los Angeles  
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**External Project Contact :** All UCTC projects are co-sponsored by Caltrans, Contact CoCo Briseno, Caltrans, 1120 N St., Sacramento, CA 94305, tel. 916 324-2440

**Abstract:** This research examines how transportation scholars, practitioners, and policymakers differ in their levels of understanding of and attitudes toward transit costs and fares. We focus on transit fares because the recent and relatively widespread adoption of smartcard technology allows transit agencies to implement fares that vary by distance, time-of-day, and/or mode to reflect differences in marginal costs. Scholars have long argued that fares set to reflect often large variations in transit costs by distance, time-of-day, and/or mode could substantially improve both the efficiency and effectiveness of transit services. Most transit agencies, however, have not moved to implement any form of marginal cost fares. This research uses a survey of a variety of people in transit agencies about their understanding of marginal costs, their basis for fare setting, and whether they have considered using smart cards to move toward marginal cost forms of pricing. We also use in-depth interviews to test for differences among the three groups in their rationales for pricing transit services, and what kinds of information they deem relevant to making fare policy. Our goals are, broadly, to understand how information about transportation costs, prices, and behavior are communicated among different types of transportation professionals. More specifically, we seek to understand how smart cards can be used creatively to improve the efficiency and effectiveness of public transit services.

**Key Words:** transit costs, transit fares, smartcard technology, survey, fare setting, marginal cost forms of pricing, interview, efficiency, effectiveness, public transit.

**Objective:** This research examines how transportation scholars, practitioners, and policymakers differ in their levels of understanding of transportation-related problems, and how these differences affect information about them is perceived, and solutions to them are devised.

**Tasks:**

Task 1: Literature review;  
Task 2: Survey design and administration;  
Task 3: Survey analysis;  
Task 4: In-depth interviews;  
Task 5: Interview analysis;  
Task 6: Production of deliverables.

**Milestones, Dates:** Official start date August 1, 2007, end July 31, 2008

**Student Involvement:** Graduate Student Researcher

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

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

**Potential Benefits:** This research will contribute to our understanding of how and why some ideas and policy solutions are accepted and implemented, while others are not; and how different scholars, practitioners, and policymakers approach transportation problems and solutions.

**Direct Cost:** \$54,904

**FINANCIAL STATUS**

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

Table 4 shows the committed allocations of the budget for 2007-2008.

**Table 4. ALLOCATED AMOUNTS FOR YEAR 20**

**University of California Transportation Center Budget for 2007-8**

**\$1,633,200 Federal and Matching \$1,633,200 Caltrans Funds**

**Total Budget: \$3,266,400**

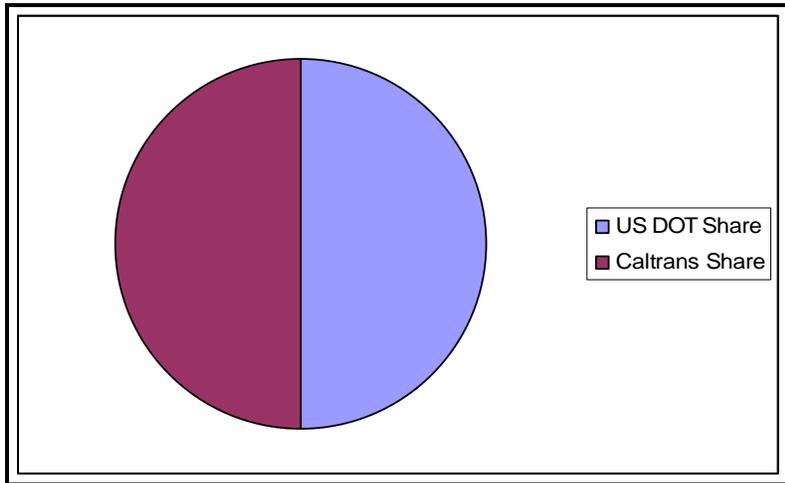
Source:

<b>ITEM</b>	<b>USDOT</b>	<b>Caltrans</b>	<b>SUM</b>
Center Director Salary		85,000	85,000
Faculty Salaries	50,000	200,000	250,000
Administrative Staff Salaries	25,000	75,000	100,000
Other Staff Salaries	54,000	150,000	204,000
Student Salaries	200,000	500,000	700,000
Staff Benefits	33,250	114,000	147,250
<b>A- SUBTOTAL SALARIES AND BENEFITS</b>	<b>362,250</b>	<b>\$1,124,000</b>	<b>1,486,250</b>
Scholarships, including student fees and tuition when applicable	900,000	188,000	1,088,000
Permanent Equipment	5,000		5,000
Expendable Property & Supplies	50,119	100,000	150,119
Domestic Travel	40,000	71,200	111,200
Foreign Travel	25,000	0	25,000
Other Direct Costs (Specify)		150,000	150,000
<b>B- SUBTOTAL DIRECT COSTS NOT INCLUDING SCHOLARSHIPS ETC</b>	<b>120,119</b>	<b>321,200</b>	<b>441,319</b>
<b>TOTAL COSTS</b>	<b>1,382,369</b>	<b>1,633,200</b>	<b>3,015,569</b>
<b>C-TOTAL SUBJECT TO IND.COSTS</b>	<b>482,369</b>	<b>0</b>	<b>482,369</b>
Facilities & Admin. (Indirect) Costs	250,832	0	250,832
<b>TOTAL COSTS</b>	<b>1,633,200</b>	<b>1,633,200</b>	<b>3,266,400</b>
	50%	50%	100%

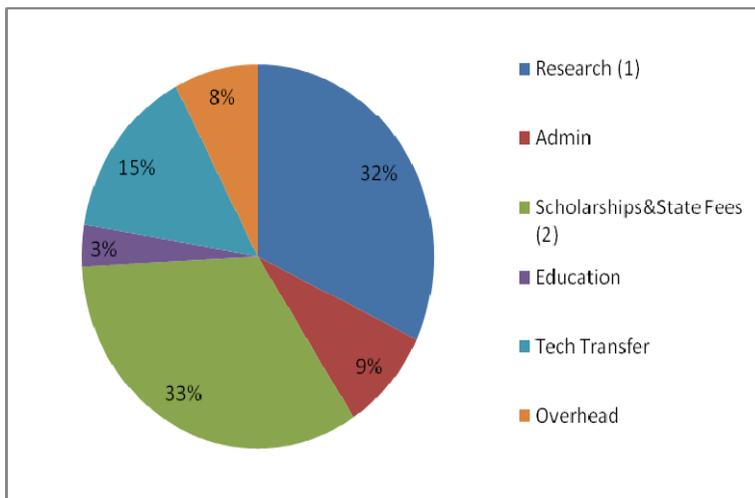
## FUNDING SOURCES AND EXPENDITURES

Revenues for UCTC came in equal amounts from US DOT and Caltrans. Expenditures were made in accordance with the submitted budget. All funds were allocated to budgeted categories during 2004-2005.

Figure 1 illustrates revenues and Figure 2 illustrates direct expenditures (committed amounts by allocation category) for UCTC.



**Figure 1. UCTC Revenues, Year 20 (2007-2008)**



**Figure 2. UCTC Expenditure Allocations, Year 20 (2007-2008)**

## APPENDIX 1. GLOSSARY

ACCESS - the research magazine published by the University of California  
CAD- computer-aided design  
CALTRANS- the California Department of Transportation  
CE-CERT – the Civil Engineering Center for Engineering Research and Technology at UC Riverside  
CCIT- California Center for Innovative Transportation located at UC Berkeley  
CMA- Congestion Management Agency, special-purpose county-level organizations in California  
CUTC - Council of University Transportation Centers  
EPA- the Environmental Protection Agency  
FHWA- the Federal Highway Administration of the US Department of Transportation (USDOT)  
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  
GMS – Global Metropolitan Studies, an interdisciplinary initiative at UC Berkeley  
GSR- graduate student researcher  
IGS- the Institute of Governmental Studies at UC Berkeley  
ISTEA- the Intermodal Surface Transportation Efficiency Act  
ITS - the Institute of Transportation Studies (branches at the Berkeley, Davis, Irvine, and UCLA campuses)  
IURD - the Institute of Urban and Regional Development at UC Berkeley  
Leonard Center – the Leonard Transportation Center at San Bernardino State University, a UT  
METTRANS- the Center for Metropolitan Transportation Studies at the University of Southern California, a UTC  
MPO- Metropolitan Planning Organization  
MINETA - Mineta Transportation Institute at San Jose State University, a UTC  
NEXTOR - National Center of Excellence for Aviation Operations Research headquartered at UC Berkeley  
NRT – nonresident tuition  
NSF- National Science Foundation  
OECD- the Organization for Economic Cooperation and Development  
PATH- Program for Advanced Transit and Highways headquartered at UC Berkeley  
PI- Principal Investigator  
RABA - Revenue Aligned Budget Authority  
RITA – the Research, Innovations and Technology Administration of the USDOT  
SAFETEA-LU - Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users  
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  
UCB - the Berkeley campus of the University of California  
UCD - the Davis campus of the University of California  
UCI - the Irvine campus of the University of California  
UCLA- the Los Angeles campus of the University of California  
UCM – the Merced campus of the University of California  
UCR – the Riverside campus of the University of California  
UCSB – the Santa Barbara campus of the University of California  
UCSC – the Santa Cruz campus of the University of California  
UCSD – the San Diego campus of the University of California  
UCSF – the San Francisco 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  
Volvo Center – the Center for Future Urban Transport, a Volvo Center of Excellence located at Berkeley

## **APPENDIX 2. COMPLETED RESEARCH PROJECTS – UCTC**

**PERIOD COVERED: FALL 2000 – SUMMER 2008**

**TOTAL COMPLETED PROJECTS: 127**

### **YEAR 12 (1999-2000) COMPLETED PROJECTS (20 PROJECTS)**

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

Robert Cervero, City and Regional Planning, Berkeley

**Measuring the Impact of the Internet on the Trucking Industry**

Carlos Daganzo, Civil & Environmental Engineering, Berkeley

**Roadway Tunnel Measurements of Carbon and Nitrogen-Containing Air Pollutants**

Robert Harley, Civil & Environmental Engineering, Berkeley

**Estimation of Latent Pavement Properties Using Condition Survey Data**

Samer M. Madanat, Civil and Environmental Engineering, Berkeley

**Online Versus Rolling Horizon Algorithms for Dynamic Service Fleet Operations**

Amelia Regan and Sandra Irani, Civil & Environmental Engineering

**Regional Transportation Infrastructure Finance in the U.S.**

Martin Wachs, Institute of Transportation Studies, Berkeley

**Estimating Freeway Traffic Stream Modal Activities for Air Quality Modeling**

H. Michael Zhang, Civil and Environmental Engineering, Davis

**The Transportation Behavior and Needs of Welfare Recipients**

Evelyn Blumenberg, Public Policy and Social Research, Los Angeles

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

Marlon Boarnet, Urban & Regional Planning, Irvine

**GPS-Based Data Handling for Activity Based Modeling**

Reginald G. Golledge, Department of Geography, Santa Barbara

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

Tom Golob and Amelia Regan, Institute of Transportation Studies, Irvine

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

John D. Landis, City & Regional Planning, Berkeley

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

Michael G. McNally, Institute of Transportation Studies, Berkeley

**Measuring the Role of Transportation in Facilitating the Welfare-to-Work Transition**

Paul M. Ong, Public Policy and Social Research, Los Angeles

**Development of Estimation Procedures for Activity-Based Model Forecasting**

Will Recker, Institute of Transportation Studies, Irvine

**Evaluating a University Transit Pass Program**

Donald Shoup, Institute of Transportation Studies, Los Angeles

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

Anastasia Loukaitou-Sideris, Urban Planning, Los Angeles

**The Viability of Value Pricing Demonstrations**

Kenneth Small, Institute of Transportation Studies, Irvine

**Greenhouse Gas Emissions Trading and the Transport Sector**

Daniel Sperling, Institute of Transportation Studies, Davis

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

Brian D. Taylor, Urban Planning, Los Angeles

**YEAR 13 (2000-2001) COMPLETED RESEARCH PROJECTS (15 PROJECTS)**

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

William A.V. Clark, Geography, UCLA

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

Professor Martin Wachs, Institute of Transportation Studies, UC Berkeley

**Stationary Traffic Models and Freeway Geometry**

Michael Cassidy, Civil and Environmental Engineering, UC Berkeley

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

Thomas F. Golob and Amelia C. Regan, ITS, UC Irvine

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

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

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

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

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

Paul Ong, Urban Planning, UCLA

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

John M. Quigley, Public Policy, UC Berkeley

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

Will Recker, Institute of Transportation Studies, UC Irvine

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

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

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

Anastasia Loukaitou-Sideris, Urban Planning, UCLA

**Has Parking Cashout Failed in California?**

Don Shoup, Public Policy and Social Research, UCLA

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

Brian D. Taylor, Urban Planning, UCLA

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

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

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

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

**YEAR 14 (2001- 2002) COMPLETED RESEARCH PROJECTS (15 PROJECTS)**

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

William Clark, Geography, UCLA

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

Carlos Daganzo, Civil and Environmental Engineering, UC Berkeley

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

Robert Harley, Civil and Environmental Engineering, UC Berkeley

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

Antonio Bento, Geography, UC Santa Barbara

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

Marlon Boarnet and Kristen Day, City and Regional Planning, UC Irvine

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

David Brownstone and Thomas Golob, UC Irvine

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

Robert Cervero, City and Regional Planning, UC Berkeley

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

Reginald Golledge, Geography, UC Santa Barbara

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

Arpad Horvath, Civil and Environmental Engineering, UC Berkeley

**Reinforcement Learning in Transportation Infrastructure Management**

Samer Madanat, Civil and Environmental Engineering, UC Berkeley

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

Patricia Mokhtarian and Ilan Salomon, ITS, UC Davis

**Optimal Control Policies for Urban Corridor Management**

Wilfred Recker, ITS, UC Irvine

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

Jean Daniel Saphores, ITS, UC Irvine

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

Anastasia Loukaitou-Sideris, Urban Planning, UCLA

**Equity and Environmental Justice in Transportation**

Martin Wachs, ITS, UC Berkeley

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

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

Marlon Boarnet, Kristen Day, and Craig Anderson, City and Regional Planning, UC Irvine

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

Michael Cassidy, Civil and Environmental Engineering, UC Berkeley

### **Commuter Rail, Land Use and Travel Behavior**

Robert Cervero, City and Regional Planning, UC Berkeley

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

William Clark, Geography, UC Berkeley

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

Carlos Daganzo, Civil and Environmental Engineering, UC Berkeley

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

Karen K. De Valois, Psychology, UC Berkeley

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

Thomas Golob and Amelia Regan, ITS, UC Irvine

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

R. Jayakrishnan, ITS, UC Irvine

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

Samer Madanat, Civil and Environmental Engineering, UC Berkeley

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

Michael McNally, ITS, UC Irvine

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

Patricia Mokhtarian, Civil and Environmental Engineering, UC Davis

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

Paul Ong, Urban Planning, UCLA

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

John Quigley and Stephen Rafael, Public Policy, UC Berkeley

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

Donald Shoup, Urban Planning, UCLA

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

Brian Taylor, Urban Planning, UCLA, and Martin Wachs, ITS, UC Berkeley

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

Thomas Turrentine, ITS, UC Davis

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

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

**YEAR 16 (2003-2004) COMPLETED RESEARCH PROJECTS (10 PROJECTS)**

**Experiments to Increase Freeway Merge Capacity**

Michael Cassidy, Civil and Environmental Engineering , UC Berkeley

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

Anastasia Loukaitou-Sideris, Urban Planning, UCLA

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

Patricia Mokhtarian, ITS, UC Davis

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

Kurt Van Dender, ITS, UC Irvine

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

Martin Wachs and Annie Decker, ITS, UC Berkeley

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

Theodore Cohn, Optometry, UC Berkeley

**Improved Developer Models for the Sacramento Region**

Robert Johnston, Environmental Sciences, UC Davis

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

Amelia Regan, ITS, UC Irvine

**Identification and Measurement of Freeway Congestion**

Alexander Skabardonis, PATH, UC Berkeley

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

Margaret Weir, Sociology, UC Berkeley

**YEAR 17 (20004-2005) COMPLETED RESEARCH PROJECTS (17 PROJECTS)**

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

Will Recker, ITS, UC Irvine

**Auto-mobility, Spatial Isolation, and the Poor**

Evelyn Blumenberg, Urban Planning, UC Los Angeles

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

Robert Cervero, City and Regional Planning, UC Berkeley

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

David Dowall, Institute of Urban and Regional Development, UC Berkeley

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

Reginald Golledge, Geography, UC Santa Barbara

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

Thomas Golob, ITS, UC Irvine

**The UC Davis Bicycle Studies**

Susan Handy, Transportation Technology and Policy, UC Davis

**Testing Spatial Mismatch: A Structural Equations Modeling Approach**

Robert Johnston, Environmental Sciences, UC Davis

**Street Trees and Intersection Safety**

Elizabeth Macdonald, City and Regional Planning, UC Berkeley

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

Samer Madanat, ITS, UC Berkeley

**Modeling the Adoption of Teleshopping**

Patricia Mokhtarian, Civil and Environmental Engineering, UC Davis

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

Debbie Niemeier, Civil and Environmental Engineering, UC Davis

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

Paul Ong, Urban Studies, UC Los Angeles

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

Amelia Regan, ITS, UC Irvine

**Cruising for Parking**

Donald Shoup, Urban Studies, UC Los Angeles

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

Michael Stoll, Urban Studies, UC Los Angeles

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

Martin Wachs, ITS, UC Berkeley

**YEAR 18 (2005-6) COMPLETED RESEARCH PROJECTS (13 COMPLETED PROJECTS - 1 CONTINUING)**

**Congestion Control for Highway Network Systems**

Alexandre Bayen, UC Berkeley

**Is the Gender Gap History? Revisiting Sex Differences in Driving using a National Panel, 1985 to 2005**

Randall Crane, UC Los Angeles

**A Spatial Analysis of Self-Serving and Altruistic Travel Behavior**

Konstadinos Goulias, UC Santa Barbara

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

Arpad Horvath, UC Berkeley

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

Anastasia Loukaitou-Sideris, UC Los Angeles

**A Model of Activity/Travel Scheduling/Rescheduling Decisions in an Uncertain Environment**

Wilfred Recker, UC Irvine

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

Michael Cassidy, UC Berkeley

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

Robert Cervero, UC Berkeley

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

William Clark, UC Los Angeles

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

Adib Kanafani, UC Berkeley

**Bottom-up Bridge Management System**

Samer Madanat, UC Berkeley

**The Political Calculus of Congestion Pricing**

Donald Shoup, UC Los Angeles

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

Arthur Winer, UC Los Angeles

**YEAR 19 (2006-7) COMPLETED RESEARCH PROJECTS (6 COMPLETED PROJECTS – 5 CONTINUING )**

**An Energy and Emissions Impact Evaluation of Intelligent Speed Adaptation**

Matthew Barth, UC Riverside

**Relieving Congestion by Real-time Monitoring of Traffic Conditions and Coordination of Traffic Signals across Zone Boundaries**

Michael Cassidy and Carlos Daganzo, UC Berkeley

**Evaluation of the Information Needs of the Distributed Landside Port Planning in California**

Mark Hansen, UC Berkeley

**Models for Evaluating General Truck Transportation Management Strategies**

Amelia Regan, UC Irvine

**Modeling Transportation Networks during Disruption and Emergency Evacuations**

Zuo-Jun Max Shen, UC Berkeley

**Mode Choice and Destination Choice: Estimations and Simulations for Airport Access in the San Francisco Bay Area, 2001/2002**

Kurt Van Dender and David Brownstone, UC Irvine

**YEAR 20 (2007-8) COMPLETED RESEARCH PROJECTS (5 COMPLETED PROJECTS– 9 CONTINUING )**

**Traffic Congestion: Quantifying the Real World Impact on Greenhouse Gases**

Matt Barth, UC Riverside

**Securing Linked Transportation Systems - Strategies for Urban transportation**

Adib Kanafani, UC Berkeley

**Measuring Travel Behavior of Low-Income Households Using GPS Technologies, Diary and Prompted Recall Methods**

Paul Ong, UCLA

**Real Option-based Procurement for Transportation Services**

Amelia Regan and JP Saphores, UC Irvine

**Modeling the Reliable Transportation Network Design Problems in Case of Disruptions**

Max Shen, UC Berkeley

### **APPENDIX 3. CONTINUING PROJECTS – UNIVERSITY OF CALIFORNIA TRANSPORTATION CENTER**

#### **TOTAL: 16 PROJECTS CONTINUING INTO 2008-9**

##### **A -- Year 18 - 2005-6 Projects – Continued into 2008-9 (1 Project )**

**Emission and Air Quality Impacts of New Diesel Engine Control Technologies**  
Robert Harley, UC Berkeley

##### **B -- Year 19 - 2006-7 Projects – Continued into 2008-9 (5 Projects )**

**Robust Traffic Assignment via Convex Optimization**  
Laurent El Ghaoui, UC Berkeley

**Taxi Drivers in Los Angeles: Profile of a Workforce Facing Change**  
Jacqueline Leavitt, UC Los Angeles

**Subcontracting Decisions in California Highway Procurement Contracts**  
Justin Marion and Gil Ricard, UC Santa Cruz

**Approach to Real-Time Commercial Vehicle Monitoring**  
Stephen Ritchie, UC Irvine

**Congestion and Accessibility: What's the Relationship?**  
Brian Taylor, UC Los Angeles

##### **C -- Year 20 - 2007-8 Projects – Continued into 2008-9 (9 Projects )**

**Immigrants and Travel Behavior: Effect of Ethnic Neighborhoods on Commute Time and Mode**  
Evelyn Blumenberg, UCLA

**Near Source Modeling of Transportation Emissions in Built Environments Surrounding Major Arterials**  
Marlon Boarnet, Rufus Edwards, Raul Lejano, and J Wu, UC Irvine

**Near Source Modeling of Transportation Emissions in Built Environments Surrounding Major Arterials**  
Marko Princevac and Mitch Boretz, UC Riverside

**Are TODs Over-Parked? Exploring Housing, Neighborhood, and Environmental Impacts**  
Robert Cervero, UC Berkeley

**Microscopic Analysis of Travel Behavior Change**  
Kostas Goulias, UC Santa Barbara

**The Personal Travel Assistant (PTA): Measuring the Dynamics of Human Behavior**  
Will Recker, Rina Dechter, and C. Rindt, UC Irvine

**Mitigating the Social and Environmental Impacts of Multimodal Freight Transportation Corridor Operations**  
Steve Ritchie, R. Jayakrishan, O. Ogunseitan, and R. Torres, UC Irvine

**Costs and Effectiveness of Lower-Speed, Environmentally-Friendly Urban Highway Designs**  
Ken Small, UC Irvine

**Transportation Decision-Makers, Practitioners, and Researchers: Differences in the Production and Use of Knowledge**  
Brian Taylor, UCLA

#### APPENDIX 4. PERFORMANCE INDICATORS

UNIVERSITY OF CALIFORNIA TRANSPORTATION CENTER  
UCTC BASE YEAR: 2006-7

##### Research Selection

1. Number of transportation research projects selected for funding. UCTC PROJECTS ONLY

2006-7	2007-8
14	14

1a. Number of those projects that you consider to be: basic research, advanced research, and applied research  
Projects may be included in more than one category if applicable.

	2006-7	2007-8
Basic Research	9	
Advanced Research	2	
Applied Research	9	14

2. Total budgeted costs for the projects reported in 1 above.

--direct costs only

2006-7	2007-8
\$1,165,317	\$1,049,800

##### Research Performance

3. Number of transportation research reports published. PAPERS, ARTICLES, RESEARCH REPORTS TOTAL

--UCTC sponsored only

2006-7	2007-8
60	42

4. Number of transportation research papers presented at academic/professional meetings.

-- UCTC PAPERS ONLY

2006-7	2007-8
90	62

**Education**

5. Number of courses offered that you consider to be part of a transportation curriculum. Report courses shown in the university course catalog as being offered, whether or not they were conducted during the academic year being reported. FIVE CAMPUSES WITH FORMAL TRANSPORT PROGRAMS ONLY

	2006-7	2007-8
Undergraduate	20	20
Graduate	70	70

6. Number of students participating in transportation research projects. Count individual students (one student participating in two research projects counts as one student).

	2006-7	2007-8
Undergraduate	90	90
Graduate	220	225

**Human Resources**

7. Number of advanced degree programs offered that you consider to be transportation-related.  
--FORMAL (7) AND INFORMAL (7) TRANSPORTATION SPECIALIZATIONS

	2006-7	2007-8
Master's Level	14	14
Doctoral Level	14	14

8. Number of students enrolled in those transportation-related advanced degree programs.  
--FORMAL TRANSPORTATION SPECIALIZATIONS ONLY

	2006-7	2007-8
Master's Level	110	100
Doctoral Level	40	40

9. Number of students who received degrees through those transportation-related advanced degree programs.

	2006-7	2007-8
Master's Level	80	80
Doctoral Level	10	11

## Technology Transfer

10. Number of transportation seminars, symposia, distance learning classes, etc. conducted for transportation professionals.

2006-7	2007-8
4	5

11. Number of transportation professionals participating in those events.

2006-7	2007-8
1500	670