

**Prospectus:**

**Application to be Re-Designated  
The Region IX University Transportation Center**

**University of California  
Transportation Center**

**For the Years  
2007-2011**

**Submitted to the  
Research and Innovative Technology Administration  
US Department of Transportation**

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**UNIVERSITY OF CALIFORNIA TRANSPORTATION CENTER  
APPLICATION TO BE DESIGNATED THE REGION IX UTC**

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## **A. Overview; Selection Criteria**

The University of California Transportation Center (UCTC) submits this proposal to be re-designated the Region 9 University Transportation Center (UTC). We request that the US Department of Transportation's Research and Innovative Technology Administration (US DOT's RITA) provide available funds up to \$2 million for each of two consecutive years starting in 2007 and then up to \$2,225,000 for a third year. Federal funding will be matched dollar-for-dollar by the California Department of Transportation (Caltrans). In addition, the University of California has waived overhead on the Caltrans matching funds, deeming this a critical program for the state and university.

### **Selection Criteria**

The University of California Transportation Center (UCTC) meets all of the selection criteria required in federal law.

- 1) UCTC is located in California, the largest state in Federal Region 9.
- 2) UCTC is a multi-campus research unit of the University of California. (We are not a consortium but rather a single university system.)
- 3) The University of California receives state funds (core support) many times larger than the required \$400,000 each year in regularly budgeted institutional support for ongoing transportation research and education programs. Core state support for the UC Institute of Transportation Studies- a research partner of UCTC - is over \$1 million a year and has been for several decades, and core state support for the transportation faculty averages about \$100,000 per faculty member. With over 10 faculty members in transportation at Berkeley alone, the required institutional support is more than met. (In total we have over 100 faculty members whose teaching and research is at least partly in transportation – see Table 1.)
- 4) Transportation (highway and transit) research expenditures at the Berkeley campus' ITS alone have exceeded \$20 million for each of the preceding five years and have averaged over \$25 million a year. See <http://research.chance.berkeley.edu/page.cfm?id=58> . This does not include UCTC funding, funding at other Berkeley research institutes, or transportation funding at other campuses.
- 5) UCTC has supported, through fellowships, grants, and research positions, over 100 transportation graduates a year for many years, as the annual reports we submit to USDOT indicate. Berkeley alone has awarded over 40 graduate degrees in transportation engineering and planning each year for the past five years.
- 6) Table 1 lists UCTC tenured or tenure-track faculty members who specialize in professional fields closely related to highways and public transportation on a full-time basis and who, as a group, have published a total of at least 50 refereed journal publications on highway or public transportation research during the preceding 5 years. The publications from the Berkeley faculty only are shown in Table 2, for the sake of brevity. A full list of the Berkeley transportation faculty members' publications is available at [www.uctc.net/core\\_faculty\\_pubs](http://www.uctc.net/core_faculty_pubs)

**Table 1. UCTC Faculty Affiliates**

\* faculty members who teach core courses

# emeritus professor

First Name	Last Name	Department	Campus
John	Andersen	Psychology	Riverside
Alper	Atamturk	IEOR	Berkeley
Matthew J.	Barth	Electrical Engineering	Riverside
Alexandre	Bayen *	Civil & Environmental Engineering	Berkeley
Evelyn	Blumenberg	Urban Planning	Los Angeles
Marlon	Boarnet*	Planning, Policy and Design	Irvine
Peter	Bosselmann	Landscape Architecture & Env. Planning	Berkeley
David	Brownstone*	Economics	Irvine
Michael	Cassidy*	Civil & Environmental Engineering	Berkeley
Ray	Catalano	Public Health	Berkeley
Robert	Cervero*	City & Regional Planning	Berkeley
Karen	Chapple	City & Regional Planning	Berkeley
Karen	Christensen	City & Regional Planning	Berkeley
Richard	Church	Geography	Santa Barbara
Keith	Clarke	Geography	Santa Barbara
William A.V.	Clark *	Geography	Los Angeles
David	Cocker	Chem./Env. Engineering	Riverside
Linda	Cohen	Economics	Irvine
Helen	Couclelis	Geography	Santa Barbara
Randall D.	Crane*	Urban Planning	Los Angeles
Carlos	Daganzo*	Civil & Environmental Engr.	Berkeley
Kristen	Day	Planning, Policy and Design	Irvine
Karen	De Valois	Psych., Vision Sci. & Optometry	Berkeley
Elizabeth	Deakin*	City & Regional Planning	Berkeley
Joseph	Dimento	Planning, Policy and Design	Irvine
Michael	Disch	Psychology	Berkeley
David	Dowall	City & Regional Planning; IURD	Berkeley
Robin	Einhorn	History	Berkeley
Bryan	Ellickson	Economics	Los Angeles
Jay	Farrell	Electrical Engineering	Riverside
Alex	Ferrell	Energy and Resources	Berkeley
J. Gordon	Fielding#	Social Science	Irvine
William L.	Garrison #	Civil & Environmental Engineering	Berkeley
Amihai	Glazer	Economics	Irvine
Steven	Goldman	Economics	Berkeley
Reginald G.	Golledge	Geography	Santa Barbara
Michael	Goodchild	Geography	Santa Barbara
Kostas	Goulias	Geography	Santa Barbara
Michael	Hanemann	Agr. & Res. Economics	Berkeley
Mark	Hansen*	Civil & Environmental Engineering	Berkeley
Robert	Harley*	Civil & Environmental Engineering	Berkeley
J. Karl	Hedrick	Mechanical Engineering	Berkeley
Roberto	Horowitz	Mechanical Engineering	Berkeley
Arpad	Horvath*	Civil & Environmental Engineering	Berkeley
Judith	Innes	City & Regional Planning	Berkeley
Allan B.	Jacobs#	City & Regional Planning	Berkeley
R.	Jayakrishnan*	Civil & Environ. Engineering	Irvine
Philip	Kaminsky	IEOR	Berkeley
Adib	Kanafani *	Civil & Environmental Engineering	Berkeley
Jess	Kraus	Public Health-Epidemiology	Los Angeles

Table 1 cont.			
John	Landis	City & Regional Planning	Berkeley
Charles A.	Lave#	Economics	Irvine
Jacqueline	Leavitt	Urban Planning	Los Angeles
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
Daniel	McFadden	Economics	Berkeley
Michael G.	McNally*	Civil & Environ. Engineering	Irvine
Carl	Monismith#	Civil & Environmental Engineering	Berkeley
Paolo	Monteiro	Civil & Environmental Engineering	Berkeley
Joseph	Norbeck	Chem./Env. Engineering	Riverside
Raymond W.	Novaco	Psychology and Social Behavior	Irvine
Paul	Ong	Urban Planning	Los Angeles
Christos	Papadimitriou	Computer Science	Berkeley
Juan	Pestana	Civil & Environmental Engineering	Berkeley
John	Quigley	Public Policy	Berkeley
John	Radke	Landscape Architecture & Env. Planning	Berkeley
David R.	Ragland	Public Health	Berkeley
Steven	Raphael	Public Policy	Berkeley
Will	Recker*	Civil & Environ. Engineering	Irvine
Amelia	Regan*	Computer Science	Irvine
Stephen G.	Ritchie*	Civil & Environ. Engineering	Irvine
Paul A.	Ruud	Economics	Berkeley
Jean Daniel	Saphores*	Planning, Policy and Design	Irvine
William	Sartoriano	Public Health	Berkeley
Robert F.	Sawyer#	Mechanical Engineering	Berkeley
Annalee	Saxenian	CRP; SIMS	Berkeley
Raja	Sengupta *	Civil & Environmental Engineering	Berkeley
Zuo-Jun	Shen	IEOR	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
Michael A.	Stoll	Policy Studies	Los Angeles
Brian D.	Taylor *	Urban Planning	Los Angeles
Masayoshi	Tomizuka	Mechanical Engineering	Berkeley
Kenneth	Train	Economics	Berkeley
Abel	Valenzuela	Urban Planning	Los Angeles
Kurt	Van Dender	Economics	Irvine
Pravin	Varaiya *	EECS	Berkeley
Nancy	Wallace	Haas School of Business	Berkeley
Martin	Wachs #	CEE, CRP	Berkeley
Melvin	Webber #	City & Regional Planning; UCTC	Berkeley
Margaret	Weir	Sociology & Political Science	Berkeley
Arthur	Winer*	Public Health	Los Angeles
Charles	Wyman	Chem./Env. Engineering	Riverside
Yushan	Yan	Chem./Env. Engineering	Riverside
Candace	Yano	Ind. Engr. & Oper. Res. (IEOR) & Business	Berkeley

**Table 2. UCTC Faculty Publications, Berkeley Core Faculty Only, Last 5 Years**  
 (see [www.uctc.net/core\\_faculty\\_pubs](http://www.uctc.net/core_faculty_pubs) for details)

<b>Berkeley Faculty Member</b>	<b>Journal Papers</b>	<b>Conference Papers</b>	<b>Books &amp; Book Chapters</b>	<b>Technical / Professional Reports</b>	<b>Other Publications</b>
Bayen, Alexandre	2	14	6	0	1
Cassidy, Michael	9	3	0	4	1
Cervero, Robert	35	0	1	31	0
Daganzo, Carlos	11	1	1	10	3
Deakin, Elizabeth	20	7	4	27	4
Hansen, Mark	18	11	0	7	0
Harley, Robert	16	1	1	3	0
Horvath, Arpad	13	18	1	2	6
Kanafani, Adib	1	1	0	0	2
Madanat, Samer	14	4	2	2	3
Sengupta, Raja	5	13	0	2	0
Skabardonis, Alexander	13	11	1	15	1
Totals:	157	84	17	103	21
Total publications:	382				

## Our Record

We believe that UCTC's 18-year record of accomplishment in research, education, and tech transfer fully justifies our selection to continue as the Region 9 center:

**Research:** UCTC research grants are awarded through a competitive process that relies on peer review, with reviewers drawn from other universities, the private sector, nonprofit groups, the federal government, and state, regional and local agencies. Faculty at all UC campuses except UC Davis, which has its own federally funded transportation center, are eligible to apply for UCTC funding for their research projects; researchers from other Region IX institutions that do not have a federally funded transportation center may be included in UCTC projects through partnerships with UC faculty. In addition, faculty members at other UTC centers may enter into partnerships with UCTC faculty with each center drawing funding from its own center.

UCTC has maintained an active program of basic and applied research. With funding from the UTC program, we have been able to support a mixed portfolio of research covering the full spectrum from theory, to methods and data, to design, to policy, to planning and implementation. Our work has paid off in a number of ways:

- better understanding of the demand for activities and travel
- better understanding of consumer choice processes
- improved methods for transportation systems analysis and forecasting
- new concepts, algorithms, and procedures for improved freight operations and logistics
- new strategies for managing traffic on freeways and arterials and in residential and commercial districts
- better street designs
- longer-lived pavements
- better decision support systems for highway infrastructure investment, maintenance, and rehabilitation
- reforms of parking and transportation provisions of local government zoning and regulation
- a better understanding of transportation –land use interactions
- new policies and incentives for transit-supportive development
- innovative parking management strategies
- practical assessments of the pros and cons of alternative transportation financing mechanisms for transit and highways
- design and evaluation of transportation pricing strategies
- better understanding of public-private partnerships for transportation project delivery
- improved methods for assessing transportation equity
- strategies for improving the social outcomes of transportation investments
- improved data on emissions and air quality around freeways and ports
- improved understanding of health impacts of transportation systems and user choices.

**Education:** The education programs of the University of California are a core university function conducted through departments. UCTC supports the university's educational programs in transportation in several ways. First, UCTC provides small grants to support the development of new courses at the campuses that have formal transportation programs (currently, Berkeley, UCLA, and UC Irvine; UC Riverside and UC Santa Barbara will be added in 2007.) From time to time UCTC also funds course updates. Second, UCTC provides both fellowships and research assistantships to transportation students, and this funding has helped us attract the best and the brightest into our transportation programs. Third, UCTC research is conducted by University of California faculty members with the active participation of graduate student researchers. These research activities are an important form of learning for graduate students; research also leads to new teaching in the classroom; thus research strongly supports the graduate education programs of the University.

Each year 100 or more students at UCTC-funded campuses receive masters or PhD degrees with a transportation specialization. Almost all go on to careers in transportation. (Many more students take transportation courses as part of their graduate degrees.) We are pleased to note that many of our transportation graduates have risen to positions of leadership. Indeed, several of the directors or assistant directors of long-standing UTCs have degrees from Berkeley, as do the directors and assistant directors of several newly named UTCs. Other UCTC grads are deans, tenured and tenure-track professors, state DOT bureau chiefs, directors and assistant directors of MPOs, county transportation agency executives, public works directors, chief traffic engineers, transit planning managers, logistics managers, and more. Innovative, creative graduates are one of the most important products of the federal and state investment in UCTC.

***Tech Transfer:*** As part of its technology-transfer activities, UCTC sponsors seminars and conferences where scholars and public officials meet to exchange information and research findings. Some of our presentations have directly led to new public policy initiatives and in turn, some of our ideas for research have come from these exchanges. UCTC strongly encourages faculty members to provide support to elected officials seeking information and innovative ideas about transportation, and our faculty members are frequently called upon to testify before Congress, the California State Legislature, city councils, county supervisors, and transit boards. We are frequently asked to help to shape the research programs of the federal government and of the State of California, serving on commissions and committees and providing advice and reviews. UCTC faculty members also work in partnership with Caltrans and other state DOTs as well as with MPOs, transit operators, and city and county elected officials and transportation agencies. Our efforts have helped to implement cutting-edge policies, methods, and strategies.

An important part of UCTC's tech transfer activities is the publication (electronically and in hard copy) of the results of the research UCTC has funded. Our publications include research reports, reprints of journal articles, and dissertations supported by UCTC; about 800 publications are now available. To bring our research results to a non-technical audience, UCTC also publishes a twice-yearly magazine, ACCESS, which is widely read and utilized. Finally, we give lectures open to the public, work with radio and TV shows, and offer short courses and conferences through our extension programs.

### **The Role of the UTC Program in Supporting our Transportation Research, Education, and Tech Transfer**

While the University of California had very good transportation programs before the UTC program was initiated, without a doubt our programs are stronger because of the University Transportation Centers (UTC) program. When UCTC started, the primary UC campuses involved in transportation activities were Berkeley, Irvine, and Davis, with a smaller enterprise at UCLA. With UCTC's assistance, all of these programs have thrived. The Irvine campus added an urban planning program and the Davis campus added a transportation planning and technology program in part because of UCTC-supported growth in research and teaching. The UCLA transportation program both expanded its course offerings and brought in faculty from several departments which previously were not part of the transportation enterprise. The Berkeley campus greatly expanded its joint program in Civil and Environmental Engineering and Transportation Planning while also seeing growth in individual department offerings. Berkeley also has established a new Global Metropolitan Studies Initiative (see [metrostudies.berkeley.edu](http://metrostudies.berkeley.edu)) involving over 60 faculty members from 12 departments, and has requested approval for a joint specialization in planning and public health; in both of these new programs transportation research and education figures prominently. The latest UCTC initiative is a joint center on sustainable transportation, co-sponsored by UCTC and the Berkeley Institute of Transportation Studies, the UC Energy Institute, and the Berkeley Energy and Resources Group. These new endeavors will strengthen transportation research and teaching in emerging interdisciplinary fields.

Because UCTC research funding has been available on a competitive basis to faculty members on any of the UC campuses, UCTC funding has helped to expand transportation research in transportation and to build new programs. At UC Santa Barbara, because of the growing interest in transportation stimulated in part by UCTC funding, the Geography Department has added a transportation faculty member (the former director of the Region 3 UTC) and has expanded its transportation course offerings; Santa Barbara is now establishing a formal graduate specialization in transportation. UC Riverside has developed its research in transportation and air quality and in transportation technology in part with UCTC funding. Recently faculty members on the Santa Cruz campus have joined in with research on transportation economics and finance. The new levels of funding now available will allow us to increase our support for these emerging transportation programs.

One major change has resulted from the most recent transportation legislation: Because UC Davis was the recipient of an earmarked center, Davis faculty and students now have their own source of UTC funds and will no longer be eligible for funding through UCTC. However, just as the METTRANS center at USC and the Mineta Center at San Jose State University have been affiliated with UCTC since their establishment, Davis's new UTC will be an affiliated center, as will the new center at the University of Nevada, Las Vegas and the new center at San Bernardino State University. The newly-named centers' directors have already been invited to participate in the quarterly Center Directors – Caltrans meetings, and faculty and students from the new centers will be asked to participate in the annual UCTC student conference as well as in the new UCTC-PATH annual conference that will be starting next academic year.

## **B. Vision**

The State of California, Region 9, and the nation face important transportation challenges, among them:

- adjusting transportation services to respond to changing demographics, activity patterns, and resource costs and prices
- introducing and accommodating new technologies
- managing our extensive transportation systems more efficiently
- improving the safety and security of our transportation systems
- improving intermodal connections for both passengers and freight
- providing high quality freight transportation responsive to shifts in production, consumption, and costs
- effectively managing the social, economic, energy and environmental consequences of transportation programs and projects
- 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 patterns
- designing better processes for the involvement of diverse public and private interests in transportation planning, decision making and deployment
- developing efficient mechanisms for transportation finance in the face of rapid growth and technological change.

We believe these challenges confronting the transportation sector must be addressed through creative research and development, and the deployment of that research and development. The UCTC's theme - *transportation systems analysis and policy* - will allow us to conduct research that addresses these challenges and finds ways to promote effective implementation, while complementing other technology-oriented programs at UC such as PATH and the UC Pavement Center.

Over the next three years, UCTC will continue to extend and enhance its activities, serving Region 9 and the nation as a top center for transportation education, research, and technology transfer. *Our 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 also intend to strengthen our research enterprise. Specific actions we plan to undertake include the following:

**Initiate Cooperative Research with Other UTCs.** UCTC will budget funds to support cooperative and comparative research with other UTCs. We already have taken steps to develop two partnerships:

First, in cooperation with Region II UTC, UCTC will initiate comparative research in two areas of mutual interest: the management of truck traffic in major urban regions, especially around major ports, and the effective design and implementation of bus rapid transit. Both of these topics are especially pressing for our regions. On the freight issues, this partnership will also include the Metrans Center at USC and Cal State Long Beach, where work on ports and port access is ongoing.

Second, UCTC has also begun discussions with the Region I UTC to initiate cooperative research in the area of changing demographics, public health, and transportation. UCTC faculty affiliates from Public Health and City and Regional Planning will collaborate with colleagues from MIT and Harvard.

**Develop Stronger Region 9 Connections.** The additional funding for the Regional UTC will be used to more aggressively pursue connections with other transportation researchers in Region 9, on and off the UC campuses. In the past, both UCTC and PATH have worked with faculty members at the University of Arizona and at Arizona State; we hope that additional cooperation will continue. Now that the University of Nevada, Las Vegas has a new UTC (whose assistant director is a Berkeley graduate) we expect to strengthen connections with that state and UTC as well. We have agreed to cooperate on joint research and to participate in each other's conferences and meetings. We also hope to build on recent contacts at the University of Hawaii to establish stronger connections there. Two UCTC faculty members are currently spending their sabbatical year at the University of Hawaii, Manoa; we anticipate that the connections they have made will form the basis for new relationships with the Hawaiian transportation research community in the coming years.

**Establish an annual research conference, in partnership with the Berkeley-based Program on Advanced Transit and Highways (PATH).** This multi-day research conference will serve two functions: to report on and thus help disseminate research at UCTC and PATH, and to discuss research needs and help develop the PATH and UCTC research agendas for subsequent years. The steering committee for the conference will include federal, state and local officials, representatives of transportation businesses and industries, nonprofit groups, and academics. The steering committee will both help with the conference organization and, equally importantly, will meet immediately following the conference to evaluate accomplishments to date and recommend follow-on or new research topics.

**Expand efforts to communicate UCTC research results and their practical implications.** We propose to do this in several ways: by re-establishing the Berkeley evening dinner seminar series with elected officials and faculty researchers and offering the series on other campuses as well; by increasing the number of lectures, symposia, and other events designed to inform the general public about transportation issues and options; by increasing outreach through the popular press and educational television and radio to educate a broader audience on transportation; and to strengthen continuing education opportunities for practicing professionals through the use of live broadcasts, computer link-ups, and other media.

**Increase support for our newest education and research programs.** The funding formerly provided to Davis faculty and students affiliated with UCTC will be used in large part to substantially increase support of the transportation programs and faculty research initiatives on the Riverside and Santa Barbara campuses. Over the past 15 years Riverside's faculty have developed a world-class College of Engineering Center for Environmental Research & Technology (CE-CERT) and have carried out a substantial body of important transportation research; in addition, the new Center for Sustainable Suburban Development at UCR promises to greatly expand the campus' capacity for interdisciplinary and multimodal transportation initiatives. Faculty members associated with both UCR centers have been invited to participate in UCTC. During the same period Santa Barbara's world-renowned Geography Department has become an international leader in GIS – transportation applications and has added a faculty member working on travel behavior. Because of the expanded teaching and research interest at Santa Barbara, faculty members there have put together a new graduate concentration in transportation, currently in the approval process. Starting in 2006-7 we plan to offer transportation fellowships at both UCR and UCSB.

**Increase the involvement of undergraduates in transportation research.** This is an activity that UCTC proposed in its last strategic plan but has only partly implemented because of the last few years' uncertainties and reduced funding levels for the UTC program. With the new, higher levels of funding, we will organize an active undergraduate research opportunities program, which we believe will help attract top students into graduate programs and careers in transportation. As part of recruitment for this program we will make special efforts to support the goal of diversity in the transportation work force.

**Provide new opportunities for our faculty, graduates, and other transportation professionals to interact and establish a strong network of transportation experts.** We intend for the new UCTC-PATH transportation conference to become a "must attend" event not only for academics and professionals in California but for researchers and senior practitioners from across the United States and from abroad. We also plan to hold a number of other major conferences that bring together professionals and academics, starting with the World Conference on Transportation Research which will be held in June 2007 on the Berkeley campus. This will be the first time that the World Conference has been held in the United States and UCTC faculty have joined together to make sure the conference is a success. We also have invited other UTCs in Region 9 and nationwide to participate.

We also have identified a number of specific **research initiatives** that we propose to undertake in 2007-2008, described briefly here. Additional initiatives will be identified as we work with our advisory groups.

**Reforming Local Government Transportation and Land Use Practices.** UCTC-supported research has led to three recent landmark books on the links between transportation and land use—*Travel by Design* by Marlon Boarnet and Randall Crane, *The Transit Metropolis* by Robert Cervero, and *The High Cost of Free Parking* by Donald Shoup. In addition, journal articles by Cervero and by Elizabeth Deakin have developed implementation strategies that help cities and transit agencies avoid potential pitfalls. This research has already had significant effects on local government policies and practices for transportation and land use. Transit-oriented development (TOD) requires increased density and reduced parking requirements around transit stations, and several cities have relied on UCTC research to reform their zoning codes to encourage TODs. Cities are also changing their policies toward on-street parking prices and off-street parking requirements in response to UCTC research. More work is needed on traffic mitigation requirements, which ironically, often are highest for TOD areas because of the higher densities of development (with no allowances given for higher levels of walking, transit use, and biking as well as shorter auto trips that are common in higher density areas.) More work is also needed on integrating “smart” technologies for transit and parking with employment policies (e.g., employer-sponsored passes) and city marketing strategies (city-wide passes, tourist passes, etc.) In addition, land use-transportation knowledge needs to be better integrated with that of traffic operations and management so that the two policy thrusts do not contradict each other.

**New Urban Designs for Multimodal Transportation.** UCTC researchers have been at the forefront of developing new approaches for managing traffic in residential areas and shopping districts, new context-sensitive designs for urban streets such as boulevards and traffic-calmed residential streets, improved designs for safety in and around transit stations and for pedestrians and bicyclists, and new strategies for multimodal street operations and for transit station area access planning. More work is needed in further developing, testing, evaluating and refining these designs. A particular need is to develop new institutional arrangements to effectively implement and operate context-sensitive designs, especially where multiple modes and multiple street functions are at work. We propose to continue to work on these design, operations and implementation issues.

**Improving Traffic Operations.** Traffic operations research both designs and field tests advanced, innovative methods for managing roadway traffic to reduce traveler delays and manage traffic queues. Researchers at the University of California and UCTC have made important contributions to traffic operations theory, methods, and practice, and propose to continue this work in close cooperation with the California PATH program and Caltrans. We will work together on theory-building, methodological developments, testing and deployment:

--**Traffic Surveillance:** Methods have been developed to perform detector diagnostics and use detector data for travel time estimation, incident detection, traffic control and other applications. New sensors have been developed that can successfully replace conventional sensor systems and perform better. Advanced machine vision algorithms for vehicle tracking from video images have been developed to produce detailed data of vehicle trajectories for studying driver behavior and traffic dynamics on freeways. Future work will include field tests, modeling and further refinements.

--**Data Processing and Analysis:** We have developed data processing methods to identify the mechanism that triggers drops in discharge flow at a bottleneck and to identify the measurable aspects of its traffic that are precursors to such drops in flow. Empirical models have been developed to estimate the cause and impact of bottleneck activation. We will continue to refine these models and test alternative operational strategies with them.

--**Traffic Modeling:** Ongoing work is aimed at developing improved driver car-following and lane-changing algorithms. Several enhancements to existing simulation tools have been developed and tested, including application program interfaces. Additional model-building will enhance multi-modal capabilities.

--**Operational Strategies:** Improved ramp metering strategies have been developed and field tested at isolated merge locations. The results from the field experiments show that the proposed strategies are effective in alleviating bottlenecks and restoring high discharge flows. In addition, an improved algorithm for system-wide traffic-responsive control has been developed for a congested freeway in Los Angeles. Advanced strategies for adaptive traffic signal control are being developed and will be field tested on a major arterial. Work is in progress to develop a system that facilitates the coordination of operating agencies to minimize the response time to incidents along traffic corridors.

**Advances in Logistics and Freight Management.** Freight transportation is critical to the US economy but also is a major source of externalities including air pollution, noise, congestion, and hazardous materials spills. Strategies that provide for more efficient operations, routing and scheduling have reduced both direct and indirect costs of freight

transport. UC researchers have developed improved algorithms that have been adopted by industry and have devised operations that allow ships to be loaded and unload ships more efficiently, including ways to load trains directly from ships. UCTC work continues to examine ways to increase the efficiency of freight operations, including intercity and urban goods movements; the UCTC work extends to issues of contracting, bidding, and labor issues.

**Alternative Strategies for Managing Congestion.** Recent research at Brookings suggests that government highway spending has not been an effective strategy for reducing congestion or its growth, finding that, on average, one dollar of highway spending in a given year reduces the congestion costs to road users only eleven cents in that year (Winston and Langer, 2006.) Road pricing is increasingly advocated as an alternative congestion management strategy and has been shown to be effective in California applications, but it has been accepted so far in only a few locales. UCTC researchers have worked on both highway investment policy and on congestion pricing strategies and have the expertise to examine alternative strategies for managing congestion in greater detail than the Brookings study. We propose to critically examine not only average congestion relief expenditures but also to identify those expenditures which have been highly cost-effective, using project data from California to inform the analysis. California projects for congestion relief include new investments in freeways and arterials, investments in HOV lanes and transit-only lanes, investments in capital and operating costs of alternative modes, ramp metering, traffic detection and real-time control, traffic detection and congestion pricing, and more. We will consider both direct and indirect expenditures and the different types and levels of expenditures by location as well as costs and benefits over time, and will prepare a best practices report based on our findings. We also will investigate consumer perceptions of congestion and alternative congestion relief strategies.

**Planning for Security in Urban Transportation.** The transportation system in a metropolitan region connects together a complex of highly interdependent subsystems. Each has points of vulnerability to different types of hazards and the connections between the subsystems represent doubly vulnerable elements. Nearly all of the efforts at improving transportation systems' security in recent years have focused on the operational aspects of securing these systems, primarily through the detection and neutralization of threats. Advances in sensing and monitoring, control and communications, and response and recovery systems have been made in the short period since security became a central concern. In contrast to this sharp focus on improving the security of transport operations, relatively little attention has been paid to security as a planning requirement. However, the security of urban transportation systems is not only a function of how they are "protected," but also a function of how they are used. Travel characteristics including spatial and temporal patterns, mode and route choices, and ultimately the entirety of the land use pattern that generates these characteristics affect the security of the transportation system. Understanding these security aspects and introducing them at the planning stage may accomplish some of the goals of security with less inconvenience and cost than are entailed in securing the transportation system at the operational level alone. Proposed activities will add a demand side approach to transportation security research to complement the large amount of work done on the supply side. The ultimate goal is to develop planning approaches and criteria that incorporate security goals into transportation planning and design as well as operations and management. Along the way there are important insights to be gained from understanding the interplay between travel patterns, traveler perceptions, and security. Such an understanding is necessary in order to forecast the public's response to security measures. To illustrate with an example from aviation, we note that the increased hardships caused by the security measures at airports have caused a shift to ground transportation in short haul markets. In order to better manage risks, we will develop a taxonomy of security hazards and examine how different types of hazards are influenced by the pattern of use of the transportation system. We also will develop a taxonomy of use patterns related to security: travel patterns create varying levels of concentration, congestion, and repetitiveness of trends, among some of the aspects that affect vulnerability of a transportation network. We will map the two taxonomies to develop a framework for assessing security both from the demand and the supply side. We also will study user response to security measures. e.g., the effects of security on the **Geospatial Technologies and Remote Sensing to Transportation Systems Analysis.** Advances in GIS, remote sensing, and other new technologies potentially could be applied to a wide variety of transportation problems, from environmental measurement to analyses and predictions of weather impacts, vulnerability, and resilience to the modeling and simulation of large regions. Complementary transportation-related technologies including intelligent transportation systems communications and location-based services could be integrated with sensing technologies to increase safety, security and convenience. Major challenges include huge databases, lack of common standards, and need for staff training in the advanced science and technology involved. UCTC researchers are among the leading developers of geospatial science and technologies and will continue to tailor them, via basic and applied research, to transportation issues.

**Improving Transit Operations and Encouraging Transit Use.** Public mass transit is a vital means of transporting commuters to and from urban centers, especially in those dense areas that cannot be served by autos alone. Transit also provides basic mobility services to large segments of society, including elderly, young, disabled, and low income populations, many of whom have few other transport options. Transit can favorably influence urban form; it can enhance a community's economic prosperity; and it can contribute to a more sustainable society by reducing emissions, fuel consumption and traffic congestion. Researchers at the University of California and UCTC have contributed to several important areas of transit operations research, and will continue to develop better methods in the following areas:

**--Enhanced safety:** Researchers have developed technologies for monitoring bus and driver performance and for issuing warnings about potential collisions; for mitigating conflicts at the junctions of highways and transit rail lines; and for automatically assisting bus drivers in lane-keeping and docking tasks. The further development of these technologies and their integration into transit and road systems will be an area for additional research and testing.

**--Enhanced mobility through better access, better connectivity and more flexible service delivery:** UC researchers have worked to develop Demand Responsive Transit (DRT) service in innovative and cost-effective ways. Included here are projects on "hybrid" service whereby buses on selected routes alternate their service delivery strategy from one trip to the next, providing conventional fixed route, fixed schedule service for the general population as well as checkpoint DRT whereby passengers make advanced reservations for service and by so doing, enjoy shorter expected waiting and riding times in the system. Researchers have also been devising strategies so that more flexible van or taxi service can connect passengers who reside in outlying, low density areas to well-traveled transit trunk lines. Additional efforts to improve connectivity include research on how to integrate new mobility schemes with transit-oriented development and its implementation, and how to develop effective multimodal access plans for transit stations.

**--Improved service delivery:** Research to reduce trip times and improve service reliability (i.e., schedule-keeping) includes work on adaptive traffic signals that give priority to transit vehicles and the development of both technologies and policies for improving Bus Rapid Transit systems.

**--Innovative fares and innovative financial strategies:** Research areas include deep discount transit passes, employer-operated or funded shuttles connecting to rail transit, public-private partnerships for the delivery of transit infrastructure and services, joint development strategies, transit benefit assessments, and the use of transit as a small package transport system.

**Addressing Transportation Air Quality, Energy and Climate Change Concerns.** The transportation sector remains a major source of air pollution in the U.S., on local, regional and national scales. UCTC researchers have shown that light-duty passenger vehicle emissions have declined substantially over the last 10 years, despite growth in the number of vehicles and the amount they are driven. In contrast, heavy-duty diesel emission control efforts have lagged, and diesel fuel use in the U.S. has been growing at a rate three times faster than gasoline. As a result, diesel engines are now the largest source of nitrogen oxide (NO<sub>x</sub>) emissions nation-wide. Exhaust particulate matter emissions from motor vehicles also pose air quality and human health concerns. An issue receiving increasing attention is the effects of exhaust particles smaller than 100 nanometers in diameter; these particles are able to penetrate deep into the human lung, enter the bloodstream, and travel to the heart and other vital organs. In addition to these concerns about emissions, the transportation sector's heavy reliance on petroleum-derived fuels leads to serious national security concerns, as many countries with large oil reserves are unstable and/or hostile to the U.S. Increasing dependence on imported oil also negatively affects the national balance of payments. Finally, use of fossil fuels adds carbon dioxide to the atmosphere, leading to concerns about climate change effects such as sea level rise, more intense hurricanes, and increased frequency of droughts and very hot days. To respond to these issues, UCTC will carry out policy and technical research that addresses links among transportation, air quality, climate change, and energy issues. Among the issues we propose to address are the following:

**--Emission models and data analysis.** We will continue collection of data and development of models to describe vehicle emissions as a function of operating and environmental conditions such as freeway level of service, speed/acceleration, and ambient air temperature. The previous work at UCTC and its partners has greatly refined our understanding of these issues. Analyses connecting emissions to health effects will be given special emphasis.

**--Analysis of diesel engine emissions.** We will work to improve the description of spatial and temporal activity patterns of diesel engine use. We also will study weekday/weekend differences in truck traffic to preview future effects on air quality of diesel controls. Both of these activities will require significant improvements in freight demand and freight flow modeling; current travel demand models based on population and employment are not applicable to freight movement and improved data and models are needed to describe weekend travel patterns for both cars and trucks. We also will assess the effects of new diesel emission control technologies such as exhaust particle traps and selective catalytic reduction for NO<sub>x</sub>.

**--Addressing fossil fuel consumption.** We will continue our work, some of it in cooperation with researchers at the Lawrence Berkeley Laboratory, to assess costs and effectiveness of strategies for reducing dependence on petroleum in the transportation sector: use of biofuels such as ethanol, new vehicle technologies such as hybrids and fuel cells, revisions to corporate average fuel economy (CAFÉ) standards, and promotion of alternative modes such as carpools and public transit. As part of the work on alternative fuels and vehicles we will develop life-cycle assessments for vehicle/fuel system options.

**--Greenhouse gas emissions and climate change.** Climate change models at UC and other universities and research laboratories are beginning to produce clearer pictures of possible consequences of the changes in climate that may occur over the next 20-60 years and beyond. UCTC will continue to support research on strategies that could reduce greenhouse gas emissions as well as research on the transportation infrastructure and operations risks that climate change could pose and possible responses to those risks.

**Protecting and Enhancing the Built and Natural Environment.** Environmental considerations both constrain transportation actions and offer important possibilities for environmental enhancement. In addition to the air quality, energy, and climate change issues discussed above, transportation planners must consider water quality, noise, endangered species and habitats, wetlands, parks and historic sites, agricultural land conservation, and community impacts in designing projects. UCTC researchers have contributed to advances in each of these areas but both basic scientific advances and better methods are needed. Research on improved facility designs, materials, and operating strategies could greatly reduce adverse impacts and help mend damage done in earlier years. New applications of GIS, remote sensing, and other advanced data bases could help improve the identification and assessment of environmental factors and can reduce the costs and time involved in analyses. Land use itself is increasingly seen as an environmental issue; among the salient topics are the effects of transportation investments on land use, including induced demand, support of infill and other private investments, and the effects of land use patterns on travel demand (e.g., sprawl and auto dependence; jobs-housing imbalance and congestion; compact growth as a means of facilitating walking, biking, and transit use). UCTC will continue to support research on these topics.

**Transportation Asset Management.** Maintenance management of a statewide network of roads is a complex problem. Roads vary from heavily traveled highways to sparsely traveled rural roads, each with its own design, environment, conditions, probabilistic rate of deterioration, and opportunities for improvement. The increasing age of the highway network combined with increasing traffic loads has led to a gradual deterioration of road conditions, with increased maintenance and rehabilitation needs occurring at a time when all programs must compete for limited resources. In addition, funding criteria have become more complex and the growing need for coordination with other departmental activities and management systems has added to the complexity. In this environment, a rigorous and modern decision support and optimization system is needed to find the best maintenance and rehabilitation policy. Over the past twenty years, UCTC researchers have contributed to two major areas.

**--Pavement performance modeling with mixed data:** UCTC researchers have advanced the state of the art in pavement performance modeling by enriching it with knowledge of physical behavior, and by fusing experimental data with field data for model development. They have bridged the gap between pavement engineers, who rely on mechanistic analyses and experimental data, and researchers in the field of pavement management, who rely on statistical analyses of data collected from in-service pavement sections. The resulting models possess most of the advantages of both data sources.

**--Adaptive policies for infrastructure inspection and repair under uncertainty:** Current models for maintenance and repair of transportation facilities have often been developed using limited data or are based on “expert judgment.” These models typically suffer from severe prediction uncertainty, but they can be improved over time by updating their parameters using additional data collected during the operation of facilities - an adaptive optimization problem. UCTC researchers have demonstrated the benefits of such adaptive optimization schemes using both Open-Loop Feedback and Closed Loop approaches, for both facility and system-level problems.

Future research needs in this field include: development of infrastructure management systems in cases of limited data, using methods such as robust optimization; development of equitable and efficient road deterioration charges that are based on sound estimates of the effect of trucks on pavement deterioration; development of reliability-based bridge management systems that account for the probability of damage due to natural hazards such as earthquakes and floods; and, extension of pavement and bridge management policies to include other connected infrastructure systems.

**New Strategies for Transportation Finance.** Although both the number of vehicles in use and vehicle -miles traveled have increased substantially, the fuel tax has not kept pace with increases in transportation construction, maintenance, and operations costs. In California and some other states, voter-approved sales taxes, developer exactions, and impact fees have been adopted to partly fill the funding gap for streets and highways and to help fund transit and other alternative modes, but stable, robust and equitable long-term funding strategies are clearly needed. Options include the increased use of tolls, congestion pricing, raising the gas tax, privatizing certain facilities and services, borrowing funds, and new forms of public-private partnerships. Particular issues needing research include the cost-effectiveness of alternative approaches, public acceptability, liability and risk issues, and short-term and longer-term returns on investments. A closely related topic is project delivery, which also may entail new organizational and financial arrangements; we also will conduct research on these topics. Two areas of special focus will be to help develop sound business models for modern transit agencies in California metropolitan areas and other US regions, and to evaluate alternative private sector roles in the delivery, operations and maintenance of streets and highways.

**Understanding Travel Behavior.** Better understanding of people's values, needs, and wants, of which travel behavior is one consequence, is essential to improving the planning, design, and operation of transportation systems. UC research teams take an interdisciplinary approach to improve our understanding of human behavior, drawing upon the different methods and perspectives of, for example, cognitive science, psychology, geography, economics, planning, engineering, and ethics. UC travel behavior researchers have developed many new ideas, published numerous papers, written seminal books, and chaired many committees in the professional societies and the National Academies, and have also demonstrated the benefits of this research in practical applications both in the public sector and in private enterprise. Over the next several years we propose to develop an improved knowledge base, better methods, more robust hypotheses, and better planning tools and applications that can be used by practitioners to improve decision making. The following topics are all high priority:

**--Integrated time-space behavioral models:** The built environment is the result of multi-faceted and diverse decisions made by individuals, households, and organizations in the context of socio-cultural, economic and environmental constraints and opportunities. Consequently, processes of urban and regional growth and development are dynamic and complex. Quantitative tools to understand and predict activity engagement and travel behavior have only partially been developed in the past few decades. Research is beginning to produce new models of behavior that take into account these dynamics over time and space. Location, land use, activity participation and travel decisions are becoming better understood as a result. In addition, research on the cognitive aspects of spatial behavior can help us to better understand processes of way-finding and route choice, knowledge that can help us develop advanced systems for traffic management and traveler information.

**--Improved Goods Movement Models:** Behavioral models are also needed to better understand and plan for goods and services movements. Important research topics include the decision-making structures used by shippers, carriers, freight forwarders, and customers, contractual choices and business models for freight industries, roles for real-time information, intelligent transportation systems, and other cost-saving technologies, and improved logistics and operations concepts and models for both modal movements and intermodal transfers.

**--Improved Transportation Data Collection:** While there is a trend toward more in-depth travel and transport data collection, many questions persist regarding the efficient collection of passenger and freight transportation data. Research at UCTC has helped to develop new data collection approaches including laboratory methods as well as interactive, technologically aided surveys using portable telecommunication devices, probe vehicles, global positioning systems, and sensors of the environment. In addition, UC researchers have worked to improve multiple-day diary methods for both cross-sectional and longitudinal assessments of behavior, along with advanced sampling strategies. Some more specific tools in this area are data collection methods that unveil the full spectrum of multiple decision-making and judgment strategies and the ways in which they change under differing situations and circumstances. Additional development of these and other new methods of data collection will be carried out as a step toward building better decision-support tools.

**--Improved forecasting, scenario testing, and decision support tools:** Regional travel demand forecasting tools and statewide long-range transportation planning systems have been the decision-support tools targeted by traveler behavior research for many years. However, significantly improved methods are needed to capture urban dynamics and to depict future scenarios of urban evolution. Changing demographics and the different behaviors of different subpopulations are one example of an area where better methods and tools are needed; another example is the incorporation of supply chain management concepts into goods movement and truck travel forecasting to reflect the interactions of producers, shippers, carriers, receivers, goods retailers, and consumers. In addition, flexible model systems are needed to study the effect of policies that cannot be tested in the real world—for example, the effects that changing strategies for grocery replenishment could have on truck trips and household trips. Finally, better tools

are needed to provide quick-response analyses of alternative corridors and locations, modal combinations, operating strategies, and pricing schemes in response to public inquiries, preferences and needs and to analyze the efficacy of the strategic business plans of agencies and firms. We will carry out basic and applied research on these topics and others as they emerge.

**Social Effects of Transportation Systems.** The ability of our transportation systems to respond to the varying needs of diverse populations is an ongoing focus of transportation policy, planning, and analysis. Among the critical issues facing the US include: the aging of the US population and attendant issues of transportation access, safety, and mobility; transportation for low income and disadvantaged groups; cultural and social impacts of transportation infrastructure and operations; environmental and social justice issues relating to transportation; and the interaction of transportation opportunities and choices and public health outcomes. Transportation facilities themselves are increasingly recognized as part of the socio-cultural heritage of the US and their history is increasingly being documented. UCTC researchers have been leaders in researching these issues and will continue to carry out investigations and policy designs to address transportation's social effects.

**New Institutional Arrangements.** Changing methods of finance, public-private partnerships, new contracting procedures, and new assignments of responsibility for transportation decision-making are changing the organizational and institutional context for transportation. UC researchers will work with state DOTs, MPOs, and local agencies on these issues. Topics for research include performance measurement, the constitution of MPO boards and MPO voting procedures, collaborative methods for decision-making, costs, benefits, and liability issues associated with new forms of contracting, stakeholder involvement in transportation planning processes.

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We believe that the pursuit of these research strategies and research initiatives will produce lasting benefits to the University, the transportation profession, and to the public at large, through the expansion of knowledge and its creative application to policy design and the development, operations and management of our transportation systems. In addition, the cadre of professionals trained with UCTC support will continue to advance transportation knowledge and expertise for many years into the future. Certainly, the continued availability of funding is critically important in attracting students and faculty into transportation education and research, and we hope that the UTC program will be a permanent part of federal transportation activities. We expect, however, that the next three years of UTC funding will produce lasting benefits and will permanently strengthen transportation education and practice, regardless of the future of the UTC program.

### **Matching Funds**

Caltrans has already begun the processing of an amendment to our state grant agreement that will match the new federal funding for UCTC dollar-for-dollar; they, like we, are hopeful that our application will be successful and bring valuable resources to our state and region. Likewise, the University of California has waived overhead on the state match, deeming the UCTC a critical state program; we have received UC Office of the President approval for a continuation of this waiver for the entirety of this renewal period.

In some instances our research projects will have additional matching funds from state, regional, and local agencies and private organizations. For example, from time to time we will provide matching funds for a new initiative or will add funds to a project being conducted at one of our research centers (see Section I) in order to allow the researchers to investigate an important issue that was not included in the original grant. We also have "match" in the form of faculty time devoted to UCTC-sponsored research and educational activities during the nine-month academic "year," when faculty salaries are funded by the University of California. In addition, the UCTC draws support from several permanently (separately) funded research institutes and academic departments, which administer individual UCTC research grants and fellowships. In particular, the Institutes of Transportation Studies at Berkeley, Irvine and UCLA and the Institute of Urban and Regional Development at Berkeley will continue to provide significant levels of assistance for faculty and students.

UCTC faculty and students also benefit from their access to University computer, data, and library resources. Of particular note is the Harmer E. Davis Library of the Institute of Transportation Studies on the Berkeley campus, which was established in 1948 and is supported with Caltrans funds allocated through a direct line item in the state budget. The Library provides services to all campuses as well as to others through lending library exchanges.

## **Multiparty Arrangements**

The University of California is a single university system with multiple campuses. The University operates under the direction of its Board of Regents and President. Each of the campuses has its own campus-level administration under a chancellor and conducts its own education and research programs consistent with system-wide policies.

The University of California Transportation Center is a multi-campus research unit reporting both to the (system-wide) UC Office of the President and the Berkeley Vice Chancellor for Research. Contractual arrangements are with the Regents of the University of California; however the contract will be administered by the Sponsored Projects Office on the Berkeley campus where UCTC Headquarters is physically located. The Center Director, also located at Berkeley, will be the PI for the federal grant and for the matching funds and will have the direct responsibility for the center and its contracts. Faculty and students at campuses will participate in UCTC programs through intercampus sub-awards (no additional contracting is necessary) and will report to the Center Director on progress and performance. Staff at UCTC Headquarters will provide the day-to-day administration for the Center. Our transportation magazine, ACCESS, is edited and published at Berkeley but accepts articles from scholars throughout Region 9.

Berkeley, where UCTC is headquartered, is the largest and oldest of the transportation programs on the UC campuses – its Institute of Transportation Studies was established in 1947 – and for the past 18 years Berkeley has been responsible for about half of the total expenditures of the Center. However other campuses have received substantial funding and have used the funding to build their transportation programs, as described later in this prospectus.

## **C. Theme: Transportation Analysis and Policy**

UCTC's theme is Transportation Systems Analysis and Policy. This theme was chosen recognizing that transportation is one component of a societal system that is affected by and has effects on the movement of goods, people, and information. Transportation research does more than just investigate how to move people and freight around—it also studies ways of meeting basic social goals, distributing goods and services, expanding production and trade, improving urban structure, creating jobs, and reducing poverty. UCTC thus supports research and education that analyzes transportation systems and the public and private sector policies that are integral to them. Our research draws upon the knowledge of many disciplines, including but not limited to engineering, economics, city and regional planning, geography, political science, sociology, history, public policy, business administration, and management.

## **D. Relationship to US DOT Goals**

UCTC aims to support the national research, development, and technology priorities of US DOT and its operating administrations, as well as the research priorities of Caltrans and other Region 9 partners. We refer to the U.S. Department of Transportation Strategic Plan, the U.S. Department of Transportation Research, Development, and Technology Plan, and other national research documents as well as to the Caltrans Strategic Plan and other Region 9 strategic plans in formulating and updating our research priorities. We also call upon federal, state, regional and local partners, public and private, to help shape our research agendas and to help select research projects through our peer review process. Starting in 2007 with our new annual research conference and its steering committee, we will further call upon our partners to offer advice on research needs as well as to offer feedback on the research results we present.

In particular, USDOT lists safety, security, mobility, global connectivity, environmental stewardship, and organizational excellence as its main objectives ([http://www.dot.gov/stratplan2008/strategic\\_plan.htm](http://www.dot.gov/stratplan2008/strategic_plan.htm).) The Caltrans strategic plan lists safety, mobility, flexibility, stewardship, and project delivery as key objectives. We agree with these objectives and aim to address them in all aspects of our work.

The UTC Program's *mission*, set forth in SAFETEA-LU, Sec. 5402, is our own: to significantly advance the state-of-the-art in transportation research and expand the workforce of transportation professionals. Just as our mission matches that of the UTC program as a whole, UCTC's *objectives* also are identical to those of the overall UTC program: 1) to carry out basic and applied research, the products of which are judged by peers and other transportation experts to advance the body of knowledge in transportation; 2) to offer superlative transportation education that includes multidisciplinary course work and participation in research; and 3) to provide an ongoing program of technology transfer that makes transportation research results available to a wide range of potential users in forms that can be implemented, utilized, or otherwise applied.

## **E. National Leadership**

The University of California is a nationally and internationally-recognized center of excellence for research and education in transportation. Our transportation engineering and planning programs are ranked among the top in the world and our graduates are in positions of leadership nationally and internationally as well as regionally. Our faculty and alumni have been asked to speak on transportation matters to Congressional committees, AASHTO and the ECMT. We have worked with USDOT administrators and staff on a variety of issues and have led national commissions and blue ribbon panels.

UCTC faculty members helped to develop the national strategy for surface transportation research, contributing to the report of the National Highway Research and Technology Partnership entitled *Highway Research and Technology: The Need for Greater Investment* (April 2002) as well as other research programs such as the Surface Transportation Environmental Program. UCTC faculty members also have been active in working with senior administrators of the Federal Transit Administration on research and policy development.

UCTC faculty members are also highly visible in professional circles. Many UCTC faculty members are current or former members of the TRB Executive Committee or have chaired TRB committees. Almost all are members of one or more TRB committees. UCTC faculty members also have been active on the panels of NCHRP, TCRP, and other national research programs, as well as in ITE, ASCE, APA, ACSP, and other professional and learned societies.

UCTC serves as a regional, national, and indeed international resource for transportation research, education, and technology transfer. Except for a few books published with UCTC funding and a handful of films made by UCTC researchers, all of our publications are available electronically on the UCTC website, which receives thousands of downloads a year. By tracking our web "hits," publication requests, and requests for faculty participation in meetings and events, we know that our research is used by elected officials and staff members of federal, state and local government agencies throughout the US, by international organizations such as the European Council of Ministers of Transport (ECMT) and the European Commission (EC), and by professors, students, private corporations, and nonprofits from all over the world

UCTC's recognized role as a national and international leader in transportation research is the reason that we were asked to host the first Organization for Economic Cooperation and Development roundtable ever held in the US (on transportation, urban form, and the environment; March 2006), and also is the reason that we were recruited to serve as the local organizer for the first World Conference on Transportation Research ever held in the US (June 2007.)

UCTC graduates have gone on to leadership positions at federal and state agencies, metropolitan planning organizations, city and county transportation agencies, in local government, NGOs, and the private sector, and many are now transportation academics themselves. Indeed several UTC directors and assistant directors around the US are UC graduates, and several received UCTC funding while earning their degrees.

## **F. Regional Role**

UCTC is pleased to serve as a focal point to help coordinate transportation research and education programs in Region IX. UCTC will work closely with the other transportation centers in California (which also will be co-funded by Caltrans) as well as with the Nevada UTC and its funding partners. We already have a track record of successful coordination; ever since the Metrans and Mineta UTCs were established, we have held joint Caltrans-Center Director meetings two or three times a year to discuss shared research interests and needs. UCTC has invited other centers to participate in these meetings (and in the case of the Nevada UTC, to invite its local sponsors to participate as appropriate.) We also will invite the new UTCs to join us at the UCTC annual student conference and in other

UCTC-sponsored events. Both Metrans and Mineta faculty members are already participants. The two new California UTCs will receive matching funds from Caltrans, so it will be especially important to coordinate efforts.

UCTC has well-established cooperative relationships with the other centers in our region, including the Metrans Center at USC and Cal State Long Beach, the Mineta Center at San Jose State, and the three new centers named in the most recent transportation bill, California State University, San Bernardino, University of California, Davis, and University of Nevada, Las Vegas. UCTC will serve as a resource to these centers. We have already made the services of the Harmer E. Davis Transportation Library at the Berkeley campus available to faculty and students on the other centers' campuses and will extend library assistance to the other UTCs. We also will include their faculty and students in meetings and symposia that we convene and encourage their students to participate in the annual UCTC student conference. We will link our websites to the new UTCs' websites.

## **G. Dissemination of Results**

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

The UCTC 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 on the Web. We distribute all UCTC publications free of charge, and also make reprints of journal articles available.

The UCTC web page provides information on our programs, summaries of our research, and electronic access to nearly all of our publications – books and films excepted. We currently list nearly 800 papers on our website. In 2004-5 UCTC received over 26,000 website "hits," with over 125,000 downloads of papers and reports.

In addition, we produce the twice-yearly ACCESS Magazine, which summarizes UCTC-sponsored work in a style designed for a general audience. Managing Editor Melanie Curry works closely with Founding Editor Melvin Webber (Professor Emeritus of City and Regional Planning and the first Director of UCTC), who has a talent for identifying topics that are timely and apt. Together with UCTC researchers, the editors produce informative, readable articles, even on topics that are highly technical and specialized. We distribute about 20,000 hard copies of each edition of ACCESS. Many others read ACCESS in libraries and on the web – we recorded 29,000 downloads of ACCESS in 2004-5. Subscribers and web readers include academics, business leaders, elected officials, and government staff members all over the United States and abroad. We include a listing of other available publications in ACCESS and on our web page.

UCTC also has successfully disseminated the results of transportation research and education programs through ITS Extension. ITS Extension courses are designed primarily for California clientele but many courses attract participants from the entire western portion of the US and some serve a national market. Over the years UCTC research has been the basis for Extension courses on transportation finance, transportation-air quality, advanced methods for traffic operations, transit planning and policy, transit-oriented development, and more.

In addition, UCTC has supported both regularly held and special-event conferences and symposia. An example of a regularly held conference is the annual Lake Arrowhead Conference on transportation, land use, and the environment, a meeting that brings together academics, federal, state and local staff members, elected officials, and private sector leaders to discuss important policy topics. An example of a special event conference was the OECD-ECMT Roundtable 37 on transportation, urban form and the environment – an invitational event held in Berkeley in March 2006 - the first OECD Roundtable ever held in the US. Over the years UCTC also has sponsored dinner events for elected officials, briefings for the California Transportation Commission, and lecture series open to the general public.

UCTC faculty members also have been active in working with members of the California Legislature and the US Congress. We regularly brief legislative leaders and testify at legislation hearings in California; during the most recent surface transportation reauthorization, several of us also provided testimony for Congressional staff and Congressional committees.

Other activities in which UCTC researchers have actively participated include:

- distance learning and videoconferences on such topics as transit-oriented development and demand management
- technology demonstrations, for example on carsharing and smart parking.
- briefings for city councils and county boards of supervisors, state legislators and members of Congress and their staff about the findings and implications of our research
- lectures, symposia, and other events designed to inform the general public about transportation issues
- Increased outreach through the popular press (radio shows, TV shows, newspaper interviews) to educate a broader audience on transportation
- Increased outreach to pre-college and undergraduate students and the general public (career days on the Berkeley and Irvine campuses, e.g.)

We plan to continue these efforts and have asked our staff editor to take the initiative to bring even more of our authors' work to a wide audience.

***Continuing Education:*** Transportation courses and other education and training opportunities are offered through the ITS Extension (which operates statewide) and the Extension programs of the various campuses. These courses reach transportation professionals and others who need a better understanding of transportation to effectively carry out their work in fields such as air quality planning and land use planning. UCTC research is frequently included in short courses offered by the University Extension. The UCTC actively encourages researchers to participate in these activities and provides support for them to do so to the extent that resources permit. Courses specifically stimulated by UCTC activities include offerings on transportation and air quality as part of a certificate program, a specialty course on traffic calming, a course on transportation and land use, a short course on transportation planning methods, and a specialty course on environmental justice and transportation.

***Conferences and Symposia:*** In addition to publishing all work supported by the Center, UCTC grant recipients are expected to participate in occasional UCTC-sponsored conferences and symposia, including the annual student conference sponsored by the UCTC. We expect UCTC researchers to give public lectures and seminars in the ongoing events series on the various campuses, as well as in national and international meetings on transportation research and practice. Travel to conferences is supported as part of research grants, and additional travel grants are made on a case by case basis when funds are available. We consider such activities in evaluating a researcher's subsequent applications for support.

UCTC has been a major sponsor of two annual conferences, the Lake Arrowhead Conference on the Transportation/Land Use/ Environment Connection and the Asilomar Conference on Transportation and Energy Policy. These conferences bring together policy makers and opinion leaders in retreat settings to discuss critical policy issues facing the region. They have been widely cited as effective and influential. Several important pieces of transportation legislation, such as the Employer Parking Cashout legislation and efforts to incorporate remote sensing of vehicular air pollutants into ongoing state pollution control programs, originated from discussions that have taken place at these conferences. We expect to continue to co-sponsor these conferences. In addition, we will co-sponsor with PATH a new annual Transportation Research Conference starting in 2006-7.

***Policy Advising and Public Service:*** 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.

We particularly encourage faculty affiliated with UCTC to serve as advisors to elected officials and government agencies on transportation policy issues. For example, UCTC Director Elizabeth Deakin served as chair of the Congressionally-mandated Surface Transportation Environmental Cooperative Research Program Advisory Committee. She also served two terms as the Legislature's appointee to the State Vehicle I/M Program Committee, which is charged with evaluating the state's controversial vehicle inspection and maintenance program and advising on needed revisions. Now-retired Professor Martin Wachs served ex officio as a member of the Advisory Committee to the Caltrans New Technology and Research Program, whose members are executives of transportation industries and construction companies, representatives of major metropolitan planning organizations and rural transportation interests, and others.

***Public Outreach Efforts:*** The UCTC also provides information on transportation to the general public. We do this through faculty participating in lectures, symposia and other events designed to inform the general public and by working with the popular press to educate a broader audience on transportation issues. We have asked our staff editor, a former writer for a local paper, to make special efforts to communicate our research results to her colleagues in the press.

Faculty members also have provided technical assistance and advice to a variety of federal, state and local officials, agencies, and community groups, including the FHWA and FTA, the California Secretary of Transportation, Business and Housing, members of the California Legislature, MPOs, Mayors and City Councils, traffic engineering departments, transit operators, freight companies, and nonprofit advocacy groups serving minority communities and environmental interests.

## **H. Institutional Resources**

Institutional resources available to the UCTC include: the administrative support of several academic departments, research institutes, and university services; access to university research facilities; faculty and student time donated to research; and faculty time donated to the governance of the UCTC. Each of these sources of institutional support will be available to the UCTC for the foreseeable future. (The key partnerships with other groups at the university are described in Section I.)

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 provide space, instructional facilities, offices, computational equipment, accounting services and other administrative staff needed to support UCTC fellowships and teaching and research grants. Most of this support is provided without charge. In addition, the University provides administrative services, but does not charge overhead on the portion of funds used for fellowships, and has waived overhead on matching funds from Caltrans. Because the UCTC can rely on these university resources, it is able to operate with a part-time Director and a small permanent support staff, allowing about ninety percent of UCTC's funding to be devoted to the direct costs of research, education and tech transfer.

The University also provides resources in the form of access to research laboratories, data centers, computer facilities, and libraries. The University is a federal data repository and has developed extensive capabilities to support the efficient retrieval and analysis of information from a variety of sources. Our computer facilities include advanced CAD and GIS systems. A major resource is the University of California library system, one of the very best in the world. 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.

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

Participation in the governance of the UCTC is a second way that faculty time is donated. Indeed, the willingness of faculty members and others to provide these services is critical to the Center's mode of operation. Members of the UCTC Executive Committee, all senior faculty members from the several campuses, volunteer significant amounts of time to the Center. They meet in person at least once a year, and transact business in the interim through telephone conference calls, e-mail, fax and telephone. Additional faculty members serve on committees that review fellowship applications and dissertation grant proposals.

### **Advisory Committees**

UCTC works directly with two standing committees at present, both of which function to link UCTC research, education, and/or technology transfer programs to the broader transportation community:

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 participating Institutes of Transportation Studies or their representatives, the director of the Institute of Urban and Regional Development or her representative, and faculty representatives of the major transportation degree-granting programs involved in UCTC. 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. The UCTC Executive Committee members proposed for 2006-7 are:

- Elizabeth Deakin, Director, UCTC
- Will Recker, Director, ITS Irvine
- Brian Taylor, Director, ITS UCLA
- Robert Cervero, Institute of Urban and Regional Development (IURD) representative
- Samer Madanat, ITS Berkeley
- Kostas Goulias, UC Santa Barbara
- Matthew Barth, UC Santa Cruz
- Mike Cassidy, UC Berkeley
- Jean Daniel Saphores, UC Irvine
- Randy Crane, UCLA

The Executive Committee is responsible for establishing the theme for the Center, allocating funds among research, education, and technology transfer programs, establishing subject matter priorities for research funding, setting rules for allowable expenditures on research projects, and making the final recommendations on research awards based on peer reviews. In addition, the Executive Committee reviews progress on all Center activities and helps assure sound performance on members' respective campuses. The Executive Committee conducts an annual review of the Center's overall performance and redirects activities as necessary. When the Directorship of the UCTC becomes vacant, the Executive Committee conducts the search and recommends a Director to the Office of the President of the University, which so far has always acted favorably on the Executive Committee's recommendations. The Executive Committee's time is donated.

**The UTC Center Directors- Caltrans Committee** is a committee of the UTC Directors in the state of California and the provider of their matching funds, Caltrans. The committee meets three or four times a year to coordinate research and tech transfer efforts, discuss research and training needs, and set priorities for action. High priority topics identified during the meetings of this committee are included in the UTCs' requests for proposals.

**Partner organized research unit (ORU) advisory committees** also provide advice that helps to guide UCTC research, education, and tech transfer activities. Each of the ORUs (institutes and centers) affiliated with UCTC (see Section I) has its own advisory committee that reviews its performance and offers advice on research and tech transfer needs. Because the research institutes are represented on UCTC's Executive Committee, the advice of their advisory committees is brought into the discussions of research needs that UCTC might pursue.

**The Joint Research Conference Steering Committee** will be the newest of UCTC's advisor groups. Starting in 2007, UCTC and PATH will organize an annual multi-day research conference and will establish a joint conference steering committee including academics, representatives of federal, state and local governments, and representatives of industry, business and nonprofits. This committee will not only help shape the contents of the conference but also will meet following the conference to assess its strengths and weaknesses and advise UCTC and PATH on pressing research needs, which in turn will be called out in the ensuing RFPs for both research groups.

## **I. Partnerships**

UCTC has a number of partnerships with other organized research units (institutes, centers, and initiatives) at Berkeley and other campuses. UCTC and the other transportation groups aim to complement and build upon each other's research and we coordinate regularly to avoid duplication of efforts and improve synergies. The other research groups also help administer UCTC grants awarded to faculty and students affiliated with UCTC. The Institutes of Transportation Studies, located at the Berkeley, UCLA, and Irvine campuses, all serve this administrative assistance role, as does the Institute of Urban and Regional Development at UC Berkeley. At other UC campuses individual departments generally serve as the local administrative unit for grants.

The **Institute of Transportation Studies at UC Berkeley**, founded in 1947, is one of the oldest, largest and most successful transportation research groups in the world. Faculty and students in the Colleges of Engineering (civil, mechanical, and electrical engineering and computer sciences) are joined by their counterparts from City and Regional Planning, Public Health, Management, Environmental Sciences, and the social sciences to conduct research on transportation systems. Work at Berkeley covers a wide range of topics including new technologies for highways and transit, logistics and operations, transportation economics and finance, land use and transportation policy, environmental impacts of transportation, equity, travel behavior, and transportation air quality and energy issues. Annual funding at ITS Berkeley has averaged over \$20 million a year for a number of years.

ITS Berkeley also sponsors a number of specialized programs and centers:

--**California Partners for Advanced Transit and Highways (PATH)** is the nation's largest program for intelligent transportation research. 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.

--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.

--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.

--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.

--The **Traffic Safety Center** 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, safe mobility for older drivers, and cost-benefit analysis of traffic safety interventions.

--The **UC Berkeley Center 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 Volvo 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 engineering and City and Regional Planning are the core researchers.

The second major ORU that supports transportation research at UC Berkeley is the **Institute of Urban and Regional Development** (IURD). IURD conducts research into methods of urban and regional analysis, processes of urban and regional growth and decline, and effects of alternative policies, plans, and strategies on development outcomes. IURD engages faculty members from planning, architecture, public policy, management, and the social sciences who are specialists in evolving patterns of urban and regional growth and development, the social and economic impacts of changes in urban life, land use policy and regulation, transportation alternatives, information technology applications in urban development, disaster preparedness, and improvements in methods of analysis, evaluation, and planning.

**The Global Metropolitan Studies Initiative** is a new, interdisciplinary research and education program on the Berkeley campus involving over 50 faculty members from a dozen departments. IURD houses the Global Metropolitan Studies Center, where research addressing metropolitan issues world-wide is being conducted. Global Metro Studies is in the process of hiring the first of five new faculty members whose teaching and research will cover planning, engineering, social sciences, and public health topics involving urban development, infrastructure, governance, environment, and other pressing issues. The initiative will offer new undergraduate and graduate degree options starting in 2007. Research is addressing comparative metropolitan development patterns and processes, sustainable development in the face of uneven growth – exploding cities, shrinking cities, institutions and governance of metropolitan areas, and strategies for managing the urban-rural interface. Transportation policies are a major component of all of the research topics.

The **Joint Center for Sustainable Transportation** is the newest transportation research initiative at Berkeley, jointly sponsored by UCTC, ITS, the Global Metropolitan Studies Center, the UC Energy Institute, and the UC Berkeley Energy and Resources Group. The joint 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.

Research units on four other campuses will also be active in UCTC:

**The Institute of Transportation Studies at UC Irvine** carries out interdisciplinary research on contemporary transportation issues, with faculty from engineering, computer science, the social sciences, the School of Social Ecology, and the Graduate School of Management. Research at ITS Irvine focuses on advanced transportation management systems for transit and highways, simulation of urban traffic networks, transportation system operations and control, artificial intelligence and expert systems applications, travel demand forecasting and analysis of complex travel behavior, transportation pricing and regulation, demand for alternative fuels, and growth of automobile use. The PATH Advanced Testbed Research Program and PATH's Advanced Transportation Management Systems (ATMS) Center are located at UCI, where laboratories include workstations tied directly to a modern traffic management center and to the local California Department of Transportation (Caltrans) district's freeway traffic management center.

**The UCLA Institute of Transportation Studies** focuses on transportation policy research. ITS-UCLA works closely with and receives funding from both the **UCLA Lewis Center for Regional Policy Studies** and UCTC as well as from other federal, state and local agencies. Research specializations include the transportation needs of immigrants and low-income workers, transit finance, parking policy, testing and evaluation of innovative programs to increase public transit use, and urban design for improved transit, street and highway safety and comfort.

**The Geography Department at UCSB** offers graduate training leading to the Masters and Ph.D. degrees in several areas including Earth System Science, Human-Environment Relations, and Modeling, Measurement and Computation. The new transportation specialization draws from all of these areas and is aimed at producing professionals and academics with advanced skills in spatial statistics, remote sensing, computational modeling and database systems (including GIS) and visualization. UCSB also houses the **Center for Spatially Integrated Social Sciences**, an NSF-funded center focusing on the analysis social phenomena over space, place, and time, and the **National Consortium for Remote Sensing in Transportation**, which develops new methods for mapping and documentation and builds infrastructure databases using both traditional and emerging technologies. In addition, UCSB is a member of the **National Center for Geographic Information and Analysis**, whose work focuses on accuracy and uncertainty in spatial data, on cognition, and on modeling and representation.

**The Center for Environmental Research & Technology (CE-CERT)** at UC Riverside's Bourns College of Engineering is a collaboration among industry, government, and academia developed to enhance environmental education, improve our understanding of the environment, develop new technologies, and strengthen the technical basis for regulations and policy. CE-CERT research includes developing autonomous vehicles and transportation systems for the future, converting biomass such as yard waste into vehicle fuel, measuring air pollutants and modeling how they react in the atmosphere, and using computer models to evaluate the impact of roadway improvement on air quality. Vehicle activity analysis, advanced vehicle engineering, electric and hybrid-electric vehicle research, fuel cells, advanced sensing and control, and environmental materials are among the special focuses of CE-CERT.

Researchers at other UC campuses (Santa Cruz, San Francisco, San Diego, Merced) also may participate in UCTC with sub-awards administered through their own departments and research groups. (The exception is UC Davis, which received its own earmarked center in the most recent transportation bill; UC Davis will now fund its own research but will continue as a UCTC-affiliated center.)

#### **J. Center Director and Key Staff**

Currently, UCTC has three paid staff members:

- Elizabeth Deakin, Professor of City and Regional Planning, UCTC Director (half time plus summer). Deakin has been UCTC Director since 1997. She previously was Acting Director of the Institute of Urban and Regional Studies. She is a graduate of MIT and Boston College School of Law.
- Melanie Curry, principal editor (60% time). Ms. Curry joined UCTC in Feb. 1999. She previously was managing editor for a weekly newspaper serving the Bay Area. She is a graduate of UCLA.
- Eunice Park, administrator (full time.) Ms. Park handles day to day office management and research administration for the Center. She is a graduate of UC Berkeley.

In addition, Melvin Webber, Professor Emeritus of City and Regional Planning, UC Berkeley, and former Director of UCTC, donates his time as co-editor of ACCESS magazine.

We expect to add a full time staff member to assist with record-keeping and accounting systems later in the year. UCTC also "contracts" for other support staff functions as needed to meet UTC program needs under an agreement with IURD. This arrangement allows UCTC to utilize the services of a variety of staff experts without the need to hire full-time or part-time staff of our own. In addition, UCTC uses student assistants for miscellaneous office functions and obtains webmaster services and computer support, as needed, via purchase orders.

#### **K. Allocation of Funds**

See Table 3 for the proposed allocation of both federal and matching Caltrans funds.

<b>TABLE 3:</b>	<b>ANNUAL FEDERAL BUDGET, 2007-8 and 2008-09</b>	<b>2009-10 FEDERAL BUDGET</b>
<b>I - FEDERAL BUDGET</b>		
Center Director Salary		
Faculty Salaries	110,000	120,000
Administrative Staff Salaries		
Other Staff Salaries		
Student Salaries	168,280	185,000
Staff Benefits	21,548	23,550
<b>A. SUBTOTAL SALARIES &amp; BENEFITS</b>	<b>299,828</b>	<b>328,550</b>
Scholarships, including student fees and tuition when applicable	1,300,000	1,450,000
Permanent Equipment		
Expendable Property & Supplies	40,000	46,319
Domestic Travel	40,000	45,000
Foreign Travel	40,000	45,000
Other Direct Costs (Specify)	40,698	45,000
<b>B. SUBTOTAL SUBJECT TO IND. COSTS</b>	<b>160,698</b>	<b>181,319</b>
<b>Total Direct Costs (incl. scholarships etc. not subject to indirect costs)</b>	<b>1,760,526</b>	<b>1,959,869</b>
<b>C-TOTAL SUBJECT TO IND.COSTS=A+B</b>	<b>460,526</b>	<b>509,869</b>
<b>Facilities &amp; Admin. (Indirect) Costs</b>	<b>239,474</b>	<b>265,132</b>
<b>TOTAL COSTS</b>	<b>700,000</b>	<b>2,225,000</b>
	<b>2,000,000</b>	<b>2,225,000</b>

<b>Notes</b>
Faculty and student salaries and benefits for 7-10 projects/yr., faculty salaries \$11-5K/mo
Amounts allocated to scholarships and fellowships double 2006-7+ (had been same since 988)
Supplies, domestic and foreign travel for projects and for presentations and participation at conferences and workshops
Direct costs 52% on all items except scholarships etc.

<b>II - CALTRANS MATCH</b>	<b>2007-8 BUDGET</b>	<b>2008-9 BUDGET</b>	<b>2009-10 BUDGET</b>
Center Director Salary	79,568	81,955	84,413
Faculty Salaries	257,500	265,225	273,182
Administrative Staff Salaries	134,622	138,660	142,820
Other Staff Salaries	127,018	130,828	134,753
Student Salaries	664,208	684,135	754,991
Staff Benefits	143,127	147,421	153,354
<b>SUBTOTAL SALARIES AND BENEFITS</b>	<b>1,406,042</b>	<b>1,448,224</b>	<b>1,543,513</b>
In-State Fees	210,000	210,000	255,000
Permanent Equipment	5,000		10,000
Expendable Property & Supplies	78,958	41,776	113,887
Domestic Travel	100,000	100,000	102,600
Foreign Travel	0	0	0
Other Direct Costs (Tech Transfer, Educ.)	200,000	200,000	200,000
<b>SUBTOTAL OTHER DIRECT COSTS</b>	<b>593,958</b>	<b>551,776</b>	<b>681,487</b>
Facilities & Admin. (Indirect) Costs	0	0	0
<b>TOTAL</b>	<b>2,000,000</b>	<b>2,000,000</b>	<b>2,225,000</b>

<b>Notes</b>
Director, 15% research, 15% tech trans, rest admin.; incl. summer salary
Faculty Salaries est. \$12,500/project *20 projects/yr
Administrative staff includes office administrator, accounting staff, other admin. staff as needed to meet UCTC program requirements for data gathering and reporting, tech transfer, student tracking. Totals include new hires 2006-7. Staff members in this category handle special reporting requirements for UTC program, tech transfer activities incl. travel and facilities arrangements for conferences, meetings and seminars, manuscript and graphics preparation and production; project-specific database management; data gathering from participants on multiple campuses to meet UCTC reporting requirements, and multiple project-related investigator coordination and communications.
Other staff includes Senior Editor, other tech transfer staff, webmaster and computer assistance, publications assistant (all part time)
Allows for approx. 28 GSRs starting 2006-7, 30 in 2009-10
Increases est. 3%
Benefits - staff (est. based on 2006 rates)
Based on 2006-7 fees incl. partial fees. Student % time is adjustable.
Varies according to budget needs
Approx. \$3000 per project = 60K research+ approx. \$40K HQ (incl. conf. travel, tech transfer travel, etc. for all campuses)
Overhead waived on Caltrans matching funds by UCOP due to special nature of program

## **Appendix II. ADDITIONAL REQUIRED DOCUMENTATION**

### **Attachment A. Curriculum Vitae, Elizabeth Deakin**

**Elizabeth Deakin**  
**Director, University of California Transportation Center**  
**Professor of City and Regional Planning**  
**Co-Director, Center for Global Metropolitan Studies**  
**University of California**  
**2614 Dwight Way 2d Floor**  
**Berkeley, CA 94720-1720**  
**Tel. 510/642-4749**  
**Fax 510/643-5456**  
**E-mail: edeakin@berkeley.edu**

#### **Research Interests:**

Transportation policy, planning and analysis; land use policy and planning; legal and regulatory issues; institutions and organizations; energy and the environment, new technologies.

#### **Education:**

Massachusetts Institute of Technology, S.B., (Political Science); S.M., (Civil Engineering Transportation Systems ), Boston College Law School, JD

#### **Publications**

##### **I. Books and Chapters in Books--**

###### **Co-authored Books and Monographs:**

1. E. Deakin et al., "Surface Transportation Environmental Research: A Long Term Strategy", Special Report 268, National Academy of Sciences Press, Washington DC, 2002.
2. Elizabeth Deakin and Greig Harvey, with others, Transportation Pricing Strategies for California: An Assessment of Congestion, Emissions, Energy, and Equity Impacts, prepared for a consortium of agencies under CARB Contract No. 92-316, June 1995, rev. June 1996, Nov. 1996.
3. W. Homburger, E. Deakin, D. Smith, P. Bosselmann, and B. Beukers, Residential Street Design and Traffic Control, Prentice Hall, Inc., New York (1988). Author of Chapter 3, "Planning for Traffic Control;" co-author of Chapters 1, 5 and 6.
4. --reprinted in Italian: Homburger, E. Deakin, P. Bosselmann, D. Smith, and B. Beukers, Disegno di Strade Urbane e Controllo del Traffico: La riqualificazione ambientale nei Piani urbani del traffico, Edizione italiana a cura di Gian Paolo Corda, Editore Ulrico Hoepli S.p.A., Milano, 1993
5. Greig Harvey and Elizabeth Deakin, A Manual of Regional Transportation Modeling Practice for Air Quality Analysis, Version 1.0, prepared for the National Association of Regional Councils with funding from the US Department of Transportation and the US Environmental Protection Agency, Washington, DC, July 1993.

###### **Chapters in Books:**

6. Garrison, William L. and Elizabeth Deakin, Travel, work, and telecommunications: a view of the electronics revolution and its potential impacts. Transport and information systems. In Roger Stough et al., eds, Cheltenham, England: Edward Elgar Pub., 2003. p. 312-318.
7. E. Deakin, Mainstreaming Intelligent Transportation Systems, in D. Gillen and D. Levinson, eds. Intelligent Transportation Systems, Spon, 2004

8. W. L. Garrison and E. Deakin, "Land Use", in G. Gray and L. Hoel, eds., *Public Transportation*, Prentice-Hall, New York, 1991.
9. E. Deakin, "Growth Management: Past, Present, Future," in John DeGrove (ed.), *Balanced Growth*, ICMA, Washington, D.C., 1991.
10. E. Deakin, "The United States" [case study], in J.P. Barde and K. Button (eds.), *Transport and the Environment*, Earthscan Press, London, 1991.
11. E. Deakin, "The Politics of Exactions," Ch. 5 in R. Alterman (ed.), *Private Supply of Public Services*, New York University Press, 1988.
12. E. Deakin, "Growth Controls and Growth Management: Empirical Evidence", Chapter 1 in D. Porter, *Understanding Growth Management*, ULI, 1989.
13. J. Suhrbier and E. Deakin, "Environmental Considerations in a 2020 Transportation Plan--Constraints or Opportunities?" in *Transportation 2020--Trends and Requirements for the Nation's Highway and Public Transit Systems*, National Research Council, Washington, D.C., 1989.

## **II. Journal Articles, Conference Papers**

### **2005-2006**

14. Cornelius Nuworsoo, K. Parks, and E. Deakin, Cost per-User as Key Factor in Project Prioritization: A Case Study of the San Francisco Bay Area, *Transportation Research Record*, 2006
15. E. Deakin et al., A System Plan for a Bay Area Regional Express Bus Service, *Forthcoming. Transportation Research Record*, 2006.
16. Cornelius Nuworsoo, Elizabeth Deakin, and Aaron Golub, Analyzing the Equity Impacts of Transit Fare Changes: A Case Study of AC Transit, 2006
17. Elizabeth Deakin, Social Impacts of the Interstate Highway System, *forthcoming, Transportation Research News*, 2006.
18. Christopher R. Cherry, Elizabeth Deakin, Nathan Higgins and Brian Tuey, Toward a Systems Level Approach to Sustainable Urban Arterial Revitalization: A Case Study of San Pablo Avenue, *Forthcoming, Transportation Research Record*, 2006
19. Carolyn McAndrews, Elizabeth Deakin, and Josefina Flórez, Using Community Surveys and Focus Groups to Inform Context Sensitive Design, *Forthcoming, Transportation Research Record*, 2006

### **2004-2005**

20. E. Deakin, Managing the Multi-Purpose Arterial: San Pablo Avenue from Oakland to San Pablo, *Conference Paper, Annual Meeting of the Association of Collegiate Schools of Planning, Portland, OR, October 2004.*
21. E. Deakin, Integrated Land Use and Transport Planning – Finding a Green-Gold Path, *Paper for the Symposium, Networks for Mobility 2004, University of Stuttgart - Stuttgart, Germany, September 2004*
22. Greg Newmark and Elizabeth Deakin, Recasting a Road: The History of San Pablo Avenue as a Multi-Use Urban Arterial, *conference paper, Transportation History Conference paper, University of Michigan, Dearborn, Michigan, October 2005.*
23. Chris Cherry, Eric Tang, Elizabeth Deakin, and Alex Skabardonis, Analysis of Freeway Improvements for Express Bus Service, *conference paper, Transportation Research Record forthcoming, Washington DC., January 2005*
24. Luis Mejias and Elizabeth Deakin, Redevelopment and Revitalization Along Urban Arterials: A Case Study of San Pablo Avenue from the Developer Perspective, *Transportation Research Record forthcoming, Washington DC., January 2005*

25. Manish Shirgaokar and Elizabeth Deakin, A Study of Park and Ride Facilities and Their Use in the San Francisco Bay Area Transportation Research Record forthcoming, Washington DC., January 2005
26. E. Deakin, Shuttles for the First and Last Mile, Editorial, Access, Fall 2004.

#### **2003-2004**

27. E. Deakin. et al., "Parking Management and Downtown Land Development: The Case of Downtown Berkeley, CA," Transportation Research Record No. 1898 (2004), p. 124-129.
28. E. Deakin et al., "Development of the BART System Expansion Criteria and Process ", Transportation Research Record No. 1887 (2004), p. 18-25.
29. McDonald, N., S. Librera, and E. Deakin, "Free transit for low-income youth: Experience in the San Francisco Bay Area" Transportation Research Record No. 1887 (2004), p. 153-160.
30. E. Deakin, Trends and Policy Choices: A Research Agenda, Access 23, University of California, Berkeley, Fall 2003, pp. 26-31.
31. E. Deakin, Environmental Research Needs, Editorial, Access, Fall 2003.

#### **2002-2003**

32. Deakin, Elizabeth. "Mainstreaming Intelligent Transportation Systems." Transportation Research Board Annual Meeting, 1885 (2004), p. 65-70.
33. E. Deakin, "Transportation in California: The Coming Challenges" in California Policy Issues Annual, California's Future in the Balance: Transportation, Housing/Land Use, Public Higher Education, and Water Four Decades Beyond the Pat Brown Era, Pat Brown Institute of Public Affairs, Los Angeles, CA, 2002, pp.

#### **2001-2002**

34. E. Deakin, "Sustainable Transportation: Findings from an International Scanning Review", Transportation Research Record 1792:1-11, 2002.
35. E. Deakin et al., "Policies and Practices For Cost-Effective Transit Investments: Recent Experiences in the United States", Transportation Research Record 1799: 1-9, 2002.

#### **2000-2001**

36. E. Deakin, "Land Use for Sustainable Urban Transport: An Assessment of Problems and Options", Keynote Address and Paper for the European Council of Ministers of Transport/Organization for Economic Cooperation and Development Workshop on Land Use for Sustainable Urban Transport, Linz, Austria, Sept 1998; published in Proceedings, ECMT, 2001.

#### **1999-2000**

37. T. Goldman and E. Deakin, "Regionalism through Partnerships? Metropolitan Planning Since ISTEA", Berkeley Planning Journal 14, Winter 2000. An earlier version "Partnerships Under ISTEA: An Evaluation", was presented at the Annual Meeting of the Association of Collegiate Schools of Planning, Pasadena, CA, Nov. 1998.
38. Weinstein and E. Deakin, "How Local Governments Finance Traffic Calming", Transportation Quarterly, Fall 1999. (Paper also was presented and accepted for publication at the Annual Meeting of the Transportation Research Board, Washington, DC, January 1999.)
39. E. Deakin, "Essay: Equity in Planning", Berkeley Planning Journal 13, Fall 1999.

#### **1998-99**

40. E. Deakin, "Combating Global Warming Through Sustainable Surface Transportation Policy: Assessment and Research Agenda", resource paper prepared for the Transportation Cooperative Research Program, Jan. 1999.

41. E. Deakin, "Transportation and Central Cities: Environment and Quality of Life Issues", in Transportation Issues in Large Cities, Conference Proceedings 18, Transportation Research Board, Washington DC, 1999, pp. 65-84.
42. Weinstein and E. Deakin, "A Study of Current Traffic Calming Practice in the United States", paper presented at the Annual Meeting of the Association of Collegiate Schools of Planning, Pasadena, CA, Nov. 1998; an earlier version of this paper, "A Survey of Local Traffic Calming Practices", was presented at the Annual Meeting of the Institute of Traffic Engineers Conference, Monterey, CA, Spring 1998 and published in Conference Proceedings, ITE Annual Meeting, Toronto, Canada, August 1998.
43. E. Deakin, "Land Use Impacts of Rail Transit – Revisited", Conference Paper, Rail-Volution '98 Conference, Portland, OR, Sept. 15, 1998
44. E. Deakin, "Implementing TEA 21: Integrating Transportation, Land Use and Economic Development", resource paper, Seventh Conference on Metropolitan Transportation Planning Issues, Association of Metropolitan Planning Organizations, Dallas Texas, Oct. 1998.
45. E. Deakin, "Transportation Pricing Strategies" Transportation and Land Use Impacts," International Conference on Transportation Pricing, German Marshall Fund and Pace University, New York City, September 1998.

#### **1997-98**

46. E. Deakin, "Perspectives on Causes and Cures for Urban Decay: The Role of University Urban Planning Departments in Community Building", University of Connecticut Law Review 30:4, Summer 1998, Also presented at the conference, University of Connecticut, Feb. 1998.
47. S. Mehndiratta, M. Hansen, and E. Deakin, Aggregate Influence of Time of Day Effects in Intercity Business Travel, conference paper, International Association of Travel Behavior Research, Austin, Tx., Sept. 1997.
48. Chris Porter, Laura Melendy, and Elizabeth Deakin, "Land Use and Travel Survey Data: A Survey of the Metropolitan Planning Organizations of the 35 Largest US Metropolitan Areas", IURD Working Paper 656, February 1996; published in Land Use Compendium, Travel Model Improvement Program, Washington, DC March 1998.

#### **1996-97**

49. E. Deakin and G. Harvey, "Transportation Pricing Strategies: Impacts by Income, Race, and Ethnicity", conference paper, Second National Conference on Women's Travel Issues, Baltimore, MD, October 1996. Also presented at the Annual Meeting of the Association of Collegiate Schools of Planning, Ft. Lauderdale, FL, Nov. 1997.
50. E. Deakin and G. Harvey, "Transportation Pricing Strategies: Impacts by Income, Race, and Ethnicity", conference paper, Second National Conference on Women's Travel Issues, Baltimore, MD, October 24-26, 1996.
51. Elizabeth Deakin and Greig Harvey, "Summary Report: Transportation Pricing Strategies for California: An Assessment of Congestion, Emissions, Energy and Equity Impacts", prepared for the California Air Resources Board, the Federal Highway Administration, the Environmental Protection Agency, the California Energy Commission, and Caltrans, June 1996; presented at Transportation Research Board Annual Meeting, Jan. 1997.
52. Greig Harvey and E. Deakin, "The STEP Analysis Package: Description and Application Examples", Appendix B in Guidance on the Use of Market Mechanisms to Reduce Transportation Emissions, US Environmental Protection Agency, Washington, DC, Fall 1996. Also published as Greig Harvey and E. Deakin, Description of the STEP Analysis Package, Transportation Model Improvement Program, Washington, DC, Fall 1995.

#### **1995-96**

53. Chris Porter, E. Deakin, and others. Socioeconomic and Journey-to-work Data: A Compendium for the 35 Largest US Metropolitan Areas, 1960-1995", Institute of Urban and Regional Development Working Paper. Presented at Lake Arrowhead Conference, Oct. 1995.

54. Chris Porter, E. Deakin, and others, "Journey-to-Work and Vehicle Availability Data: A Compendium for 16 US Cities with Rail Transit and Busway Systems 1960-1995", Institute of Urban and Regional Development Working Paper, also published by Federal Transit Administration, Washington, DC
55. L. Melendy and E. Deakin, "Transportation Infrastructure in the Bay Area: An Agenda", paper presented at a symposium sponsored by the Bay Area Defense Conversion Action Team of the Bay Area Economic Forum, Fall 1995; IURD Working Paper 667, April 1996.

#### **1994-95**

56. E. Deakin, "Land Use Politics and Transit: The Case of BART", paper presented at the Annual Meeting of the Transportation Research Board, Washington, DC, January 1995.
57. E. Deakin, "Market-Based Measures for Transportation Management: Pay-at-the-Pump, Road Pricing, Parking Pricing, and Vehicle Registration Fees", paper presented at the Annual Meeting of the Transportation Research Board, Washington, DC, January 1995.
58. L. Schipper, E. Deakin, and D. Sperling, "Sustainable Transportation: The Future of the Automobile in an Environmentally Constrained World", paper for the Asilomar Conference, August 1994.

#### **1993-94**

59. Elizabeth Deakin, "Urban Transportation Congestion Pricing: Effects on Urban Form", in *Curbing Gridlock: Peak-Period Fees to Relieve Traffic Congestion*, Special Report 242, Vol. 2, Transportation Research Board, National Research Council, National Academy Press, Washington, DC 1994.
60. Elizabeth Deakin and Greig Harvey, "CO2 Emissions Reductions from Transportation and Land Use Strategies - A Case Study of the San Francisco Bay Area", in Julia Trilling and Steinar Strom, eds., *Global Climate Change: European and American Policy Responses*, Proceedings of the Peder Sather Symposium, Center for Western European Studies and Royal Norwegian Ministry of Foreign Affairs, Oct. 17-18, 1991; published by the Regents of the University of California, 1993. Pp. 93-109.
61. E. Deakin, "The Changing Context of Transportation Planning: The Intermodal Surface Transportation Efficiency Act of 1991, the Clean Air Act Amendments of 1990, and their Implications for Transportation Planning and Programming", Background Paper for the Series of Seminars on Multi-Modal Planning, Sacramento, San Diego, Los Angeles, and San Francisco, CA, Fall 1993.

#### **1992-93**

62. E. Deakin, "Land Use Impacts of Congestion Pricing", paper prepared for the Transportation Research Board, Washington, DC, June 1993.

#### **1991-92**

63. E. Deakin, "The New American Toll Roads", paper presented at the Annual Meeting of the Transportation Research Board, Washington, DC, January 1992.
64. M. Heyman and E. Deakin, "Density", in *Architecture California*, Vol. 13, No. 2, August 1991.
65. E. Deakin, "Transportation and the Environment: the United States", in *Collected Papers for the Conference Transport and the Environment*, sponsored by the Economic and Social Research Council and the Science and Engineering Research Council, U.K.; Pembroke College, Oxford, England, September 1991.
66. E. Deakin and G. Harvey, "CO2 Emissions from Transportation and Land Use Strategies: A Case Study of the San Francisco Bay Area", Peter Sather Symposium, Center for Western European Studies, University of California, Berkeley, October 1991

67. E. Deakin and G. Harvey, "Congestion, Air Pollution, Greenhouse Gases, Energy Use: The Effectiveness of Transportation and Land Use Strategies for Impact Management," Proceedings of the National Conference on Transport and Greenhouse, Melbourne, Australia, Nov. 17-20, 1991.
68. G. Harvey and E. Deakin, "Toward Improved Regional Modeling Practice", Resource Paper for National Association of Regional Councils Conference on Modeling, Arlington, VA, Nov. 21-22, 1991 (revised Dec. 1991.)

#### **1990-91**

69. E. Deakin, "Transportation-Air Quality Analysis for the San Francisco Bay Area", in the American Planning Association Transportation Newsletter, Winter 1991.
70. E. Deakin, "Approaches to Traffic Mitigation: the United States", prepared for the International Symposium on Urban Road Issues, Washington, D.C., January 1991.
71. E. Deakin, "The Uneven Federal Role in Transportation: Issues in the Context of Urban Form and Growth", prepared for the session, Transportation Research Board Annual Meeting, Washington, D.C., January 1991.
72. E. Deakin, "Scoping Study: Impact of Highway Congestion on Air Quality", prepared for the Transportation Research Board, Washington, D.C., January 1991.
73. E. Deakin, "Jobs, Housing, and Transportation", Transportation Research Board Conference on Transportation, Urban Form, and the Environment, Beckman Center, Irvine, CA, Dec. 1990.

#### **1989-90**

74. E. Deakin and W.L. Garrison, "Strategic Planning for BART's Future", prepared for the Bay Area Rapid Transit District Board, Proceedings of the BART Advanced Technology Project, November 1989.
75. E. Deakin, "Toll Roads: A New Direction for U.S. Highways?", Built Environment, Summer 1990.
76. E. Deakin, "Transportation Exactions: A Survey of Policies in Sixty Communities", in Partners in Planning: Proceedings of a Symposium/Workshop Exploring the Integrated Land Use/Transportation Planning Process, Dec. 14-16, 1988, Stouffer Wailea Beach Resort, Maui, Hawaii (publication date fall 1989).
77. E. Deakin, "Advanced Highway Technologies". Report Prepared for the U.S. DOT Strategic Plan. October 1989.

#### **1988-89**

78. E. Deakin, "Transportation and Land Use Planning in Response to Congestion: A Review and Critique", Transportation Research Record, 1989.
79. E. Deakin, "Suburban Traffic Congestion: Land Use and Transportation Planning Issues; Public Policy Options", Transportation Research Board, 1989.
80. --printed in a condensed form under the title, "Diagnosing Suburban Traffic Congestion", Transportation Research News, Nov.-Dec. 1988.
81. --printed in a preliminary version in Transportation Research Circular, 1988.
82. --reprinted in Proceedings of the ULI Conference, "Costs and Benefits of Growth", May 12 & 13, 1988.
83. --reprinted in abbreviated form in Transactions, published by the Metropolitan Transportation Commission, Oakland, CA, Jan. 1988.
84. --reprinted in a slightly condensed form under the title, "Traffic Jams on Main Street", Civil Engineering, April 1988.

85. W.L. Garrison and E. Deakin, "Travel, Work, and Telecommunications: A View of the Electronics Revolution and Its Potential Impacts", *Transportation Research A*, 1988.
86. E. Deakin, "Market and Intervention Failures in Transport Policy: Case Study on the United States", report prepared for the Organization for Economic Cooperation and Development, Paris, June 1989.
87. D. Eisinger, E. Deakin, F. Wicher, and R. Ireson, "Transportation Control Measures: Technical and Institutional Guidance for State and Local Governments", *Proceedings of the Air Pollution Control Association Annual Conference*, Anaheim, CA, June 25-30, 1989.
88. E. Deakin, "Transportation Control Measures for State Implementation Plans: Institutional Guidance", Working Paper #1, prepared for the U.S. Environmental Protection Agency, May 1989.
89. E. Deakin, "Transportation Control Measures for State Implementation Plans: Organizational/Administrative Guidance", Working Paper #2, prepared for the U.S. Environmental Protection Agency, May 1989.

#### **1987-88**

90. E. Deakin, "The Politics of Exactions", *New York Affairs*, Jan. 1988.
91. E. Deakin, "Traffic Mitigation in the Land Development Process," *Transportation Research Record*, 1987.
92. E. Deakin, "Growth Controls and Growth Management: A Summary and Review of Empirical Research", in *Proceedings of the Conference, "The Growth Controversy in California: Searching for Common Ground"*, Manhattan Beach, CA, June 1988.
93. --reprinted in a slightly abbreviated form in *Urban Land*, July 1989.
94. --reprinted in a condensed version in *Western Cities*, May 1989.
95. Suhrbier and E. Deakin. "Environmental Considerations in a 2020 Transportation Plan--Constraints or Opportunities?" in *Proceedings of the Transportation Research Board Conference on Long Range Trends and Requirements for the Nation's Highway and Public Transit Systems: A Look at the Future--2020*", June 1988.
96. E. Deakin, "The Regional Highway System Concept: An Alternative for the Post-Interstate Highway Program". Paper prepared for the Metropolitan Transportation Commission, June 1988.
97. E. Deakin, "Use of the Highway Performance Monitoring System in Support of Post-Interstate Highway Policy Development: A Review and Assessment". Paper prepared for the Metropolitan Transportation Commission and the National Association of Regional Councils, December 1987.
98. E. Deakin. "Land Use and Transportation Planning in Response to Congestion Problems: A Review and Critique", paper prepared for the ACSP Conference, Los Angeles, November 1987.

#### **1986-87**

99. E. Deakin, A. Skabardonis, & A. May, "Traffic Signal Timing as a TSM Measure," *Transportation Research Record*, 1986.
100. E. Deakin and A. Skabardonis, "Assessing the Traffic Impacts of Transportation and Land Development Scenarios," *Transportation Quarterly*, October 1985.
101. --reprinted in *Current Municipal Problems*, Vol. 3, No. 2, 1986.

#### **1985-86**

102. E. Deakin, "Traffic Mitigation in the Development Process," *Proceedings of the 38th Annual Meeting of the ITE Dist. 6*, Albuquerque, N.M., July 1985, pp. 133-141.

103. E. Deakin (ed.), "Strategies for Alleviating Traffic Congestion: A Reader," prepared for the California Dept. of Transportation and the Federal Highway Administration, published by the Institute of Transportation Engineers, March 1987.(multiple reprintings)
104. E. Deakin, "California's Transportation Systems and Economic Development: Issues and Options," Proceedings of the Economic Forum, "The Golden State: Moving into the 21st Century," Sacramento, CA, September 26, 1986.
105. E. Deakin, "The Pleasanton Trip Reduction Ordinance," Proceedings of a Conference on Beltways and Expressways, Boston, MA, June 23, 1986.
106. E. Deakin, "California's Traffic Engineers--Endangered Species?" Tech Transfer, No. 11, October 1985. -- reprinted in ITE Journal, June 1986.

### III. Research Reports and Other Published Papers --

#### 2002-03

107. Deakin, E., The Changing Importance of Central Cities, Monograph Based on Deakin Lecture Series, Universitat Stuttgart, Institut fur Strassen und Verkehrswesen, August 2002, 96 pp. (published in paperback in German and English versions)
108. Deakin, E.A., et al. Intelligent Transportation Systems: A Compendium of Technology Summaries, Dec. 2002, UCTC Report 621.
109. Ni, Jason, and Elizabeth Deakin, On-Board Advanced Traveler Information Systems, Dec. 2002, UCTC Report 631.
110. Cervero, Robert, Yu-Tsin Tsai, Martin Wachs, E. Deakin et al., Reverse Commuting and Job Access in California, California Dept. of Transportation, Sacramento CA, Sept. 2002.
111. Deakin, E.A. et al., Mainstreaming ITS, Final Report to Caltrans, December 2002. UCTC Report 634

A.

#### 2001-02

112. E. Deakin, Pricing Mobile Emissions: Problems And Prospects, Paper and Presentation for the Transportation Committee, State Senate, Nov. 2001.
113. Deakin, Elizabeth, [Sustainable Development & Sustainable Transportation: Strategies for Economic Prosperity, Environmental Quality, and Equity](#), UTC Report 519
114. Deakin, Elizabeth, The Central Valley: Coping with Growth and Change, UTC Report 537
115. Deakin, Elizabeth, The Future of Transit: Market Oriented Services Will Include Small Vehicles, UTC Report 549, Reprinted from California Transit Magazine.
116. Deakin, Elizabeth, and Songju Kim, [Transportation Technologies: Implications for Planning](#), UTC Report 536
117. Deakin, Elizabeth, Chris Ferrell, Tanu Sankalia and Patricia Sepulveda, [The San Pablo Dam Road Commercial District in El Sobrante, California: Baseline Study](#), UTC Report 518

#### 2000-01

118. E. Deakin, "Land Use for Sustainable Urban Transport: An Assessment of Problems and Options", Keynote Address and Paper for the ECMT/OECD Workshop on Land Use for Sustainable Urban Transport, Linz, Austria, Sept 1998, published in proceedings, ECMT, 2001.

119. E. Deakin, "Sustainable Development and Sustainable Transportation: Strategies for Economic Prosperity, Environmental Quality, and Equity", IURD Working Paper No. 200103, May 2001.
120. E. Deakin et al., "Trends and Projections for Consideration in California's Transportation Plan", Final Report prepared for Caltrans, May 2001.
121. Mason, Jonathan and Elizabeth Deakin, "Information Technology and the Implications for Urban Transportation", 2001, Fall, UCTC California Trends Project, <http://www.uctc.net/trends>, UCTC #517.
122. Deakin, Elizabeth, John Thomas, Christopher Ferrell, Kai Wei Manish Shirgaokar, Songju Kim, Jonathan Mason, Lilia Scott, and Vikrant Sood, "Overview and Summary: Twelve Trends for Consideration in California's Transportation Plan", 2001, Fall, UCTC California Trends Project, <http://www.uctc.net/trends>, UCTC #529.
123. Thomas, John V., and Elizabeth Deakin, "California Demographic Trends: Implications for Transportation Planning", 2001, Fall, UCTC California Trends Project, <http://www.uctc.net/trends>, UCTC #530.
124. Ferrell, Christopher, and Elizabeth Deakin, "Changing California Lifestyles: Consequences for Mobility", 2001, Fall, UCTC California Trends Project, <http://www.uctc.net/trends>, UCTC #531.
125. Shirgaokar, Manish, and Elizabeth Deakin, "California Housing Trends: Implications for Transportation Planning", 2001, Fall, UCTC California Trends Project, <http://www.uctc.net/trends>, UCTC #532.
126. Wei, Kai, and Elizabeth Deakin, "Trends in California's Jobs", 2001, Fall, UCTC California Trends Project, <http://www.uctc.net/trends>, UCTC #533.
127. Ferrell, Christopher E., Songju Kim, and Elizabeth Deakin, "California's Freight Patterns", 2001, Fall, UCTC California Trends Project, <http://www.uctc.net/trends>, UCTC #534.
128. Thomas, John V., and Elizabeth Deakin, "Addressing Environmental Challenges in the California Transportation Plan", 2001, Fall, UCTC California Trends Project, <http://www.uctc.net/trends>, UCTC #535.
129. Deakin, Elizabeth, and Songju Kim, "Transportation Technologies: Implications for Planning", 2001, Fall, UCTC California Trends Project, <http://www.uctc.net/trends>, UCTC #536.

#### **1999-2000**

130. Youngbin Yim and Elizabeth Deakin, "TravInfo Field Operational Test Institutional Evaluation Final Results." California Partners for Advanced Transit and Highways (PATH) Program, Institute of Transportation Studies, University of California, Berkeley, February 2000.
131. E. Deakin et al., "Review of the New Directions Transportation Program." Institute of Urban and Regional Development, University of California at Berkeley, May 1999 (revised October 1999).
132. Elizabeth Deakin, "Local Government Responses to the Challenge of Sustainable Development – a Survey of the San Francisco Bay Area".

#### **1998-99**

133. E. Deakin, "Transportation Pricing Strategies", paper presented at the Conference on Social Cost and Sustainability, German Marshall Fund and Pace University, New York City, September 1998.
134. E. Deakin, "Implementing TEA 21: Integrating Transportation, Land Use and Economic Development", paper presented at the Seventh Conference on Metropolitan Transportation Planning Issues, Association of Metropolitan Planning Organizations, Dallas Texas, Oct. 1998.
135. J. Schwartz, E. Deakin, and S. Moss, " Smog Check H Evaluation Framework", prepared for the California Inspection and Maintenance Review Committee, Sacramento, October 1998

136. Alix Bockelman, Elizabeth Deakin, Jonathan Mason, Martin Wachs, and Chris Willeges, "Transportation Data Collection in Berkeley." Institute of Urban and Regional Development Research Report, University of California, Berkeley, June 1999
137. Elizabeth Deakin, "Regional Planning for Sustainable Transportation - Aligning Economic Development and Environmental Protection." Paper for the symposium Traffic and Urban Development, sponsored by the Dept. of Transportation Planning and Traffic Engineering, University of Stuttgart, and the Institute for Urban Construction and the Dept. of Economics, Institute for Economics and Law, Stuttgart, June 1999.

#### **1997-98.**

138. Chris Porter, Laura Melendy and Elizabeth Deakin. "Land Use and Travel Survey Data: A Survey of the Metropolitan Planning Organizations of the 35 Largest U.S. Metropolitan Areas." In Land Use Compendium. U.S. Department of Transportation, March 1998.
139. Asha Weinstein and E. Deakin, "A Survey of Local Traffic Calming Practices", Annual Meeting of the Institute of Traffic Engineers Conference, Monterey, CA, Spring 1998. Also included in the collected papers of the Annual Meeting, Toronto, Canada, August 1998.
140. S. Mehndiratta, M. Hansen, and E. Deakin, Aggregate Influence of Time of Day Effects in Intercity Business Travel, conference paper, International Association of Travel Behavior Research, Austin, Tx., Sept. 1997.
141. E. Deakin and G. Harvey, "Transportation Pricing Strategies: Impacts by Income, Race, and Ethnicity", conference paper, Second National Conference on Women's Travel Issues, Baltimore, MD, October 1996. Also presented at the Annual Meeting of the Association of Collegiate Schools of Planning, Ft. Lauderdale, FL, Nov. 1997.
142. Elizabeth Deakin, "Linking Transportation Design to Good Land Use Planning." Mayors Institute on City Design: West 1997 Institute Summary. University of California, Berkeley, CA. Nov. 20-23, 1997.

#### **1996-97**

143. J. Lamont, L. Melendy, K. Vessali, and E. Deakin, "Metropolitan Profiles: Development Patterns, Socioeconomic Characteristics, and Transit Use, 1960-1995", Institute of Urban and Regional Development Working Paper 687, June 1997.
144. M. Babsin, M. Hill, L. Melendy, M. O'Neill, and E. Deakin. "Real Estate Trends and Transit Oriented Development: A Compendium for 21 Metropolitan Regions", Institute of Urban and Regional Development Working Paper 688, June 1997.

#### **1995-96**

145. Greig Harvey and E. Deakin, Description of the STEP Analysis Package, Transportation Model Improvement Program, Washington, DC, Fall 1995. Also included in conference readings, Travel Model Improvement Program (TMIP) Conference, New Orleans.
146. L. Melendy and E. Deakin, "Transportation Infrastructure in the Bay Area: An Agenda", paper for the Bay Area Defense Conversion Action Team of the Bay Area Economic Forum, Fall 1995., IURD Working Paper 667, April 1996.
147. Chris Porter, Laura Melendy, and Elizabeth Deakin, "Land Use and Travel Survey Data: A Survey of the Metropolitan Planning Organizations of the 35 Largest US Metropolitan Areas", IURD Working Paper 656, February 1996. (Also Distributed by TMIP, BTS, and FTA)
148. Chris Porter and E. Deakin, "Socioeconomic and Journey to Work Data: A Compendium for the 35 Largest Metropolitan Areas". IURD Working Paper 657, February 1996.

149. Chris Porter, E. Deakin, and others, Journey-to-Work and Vehicle Availability Data: A Compendium for 16 US Cities with Rail Transit and Busway Systems 1960-1995", Institute of Urban and Regional Development Working Paper 658, Feb. 1996 (Also Distributed by TMIP, BTS, and FTA)
150. E. Deakin, Transportation Impacts of the 1989 Loma Prieta Earthquake: the Bay Bridge Closure- Findings from a Survey of East Bay Residents." UC Transportation Center, Oct. 1991. Summarized and distributed at "Restoring Mobility and Economic Vitality Following Major Urban Earthquakes: Lessons from Two California Quakes Within Five Years", Conference co-sponsored by the UCTC and the US DOT Bureau of Transportation Statistics, Los Angeles, April 25-26, 1996. UCTC Report.

#### **1994-95**

151. E. Deakin, et al., "Transportation Infrastructure, Activity, and Investment: A Multi-Country Data Base", prepared for the Federal Highway Administration, Washington, DC. January 1995. Vol. 1: Summary Data Base, and Vol. 2: Detailed Data Bases.

#### **1993-94**

152. E. Deakin, R. Cervero, J. Landis, G. Harvey, and D. Reinke, "BART at Twenty: Work Program for Year Three", report prepared for the Federal Transit Administration, June 1994.
153. Campus Transportation Planning Study for the Long Range Development Plan, University of California, Santa Cruz, May 1994 (team members: MKK Transportation, Joni Janecki & Associates, Prof. E. Deakin, in association with Larry Pageler and Graham Bice, Campus Planning staff).

#### **1992-93**

154. Greig Harvey and E. Deakin, A Manual of Regional Transportation Modeling Practice for Air Quality Analysis, Report prepared for the National Association of Regional Councils, Washington, DC, July 1993.
155. Greig Harvey, E. Deakin and D. Reinke, "Transportation-Air Quality Planning: Current and Future Analysis Needs", Report prepared for the U.S. Environmental Protection Agency, Region IX, San Francisco, January 1993. Greig Harvey and E. Deakin, A Manual of MPO Modeling Practice, Report prepared for the National Association of Regional Councils, Washington, DC, November 1992 (with others).
156. Greig Harvey, E. Deakin, and R. Weinberger, "Forecasting Air Passenger Demand for a BART Extension to San Francisco International Airport", Report prepared for the Metropolitan Transportation Commission, Oakland, March 1992.
157. Greig Harvey, E. Deakin, and R. Weinberger, "An Assessment of On-Call Van Operations at LAX", Report prepared for the Los Angeles Dept. of Airports, Los Angeles, CA, November 1992.

#### **1991-92**

158. E. Deakin, State Programs for Managing Land Use, Growth, and Fiscal Impact", in "Other States' Growth Management Experiences", Governor's Office of Planning and Research and Inter-Agency Council on Growth Management, Sacramento, CA, October 1991 (reprint of report prepared for the Senate Office of Research, #4 in 1989-90.)
159. E. Deakin et al., "Neighborhood Preservation Transportation Plans for Midtown and East Sacramento", Report Prepared for the City of Sacramento, Summer 1991.
160. G. Harvey and E. Deakin, "Transportation Control Measures for the San Francisco Bay Area: Analysis of Effectiveness and Costs", prepared for the Bay Area Air Quality Management District, July 1991 (rev. Oct. 1991).

**1990-91**

161. E. Deakin and R. Pujol, "Assessment of the URBEMIS Emissions Analysis Model and Its Potential for Use in a Regulatory Environment", Fall 1990.
162. E. Deakin et al., "Neighborhood Transportation Planning for Sacramento", Winter 1991.

**1989-90**

163. E. Deakin, "State Programs for Managing Land Use, Growth, and Fiscal Impact". Report Prepared for the Senate Office of Research, April 1989; revised March 1990.
164. E. Deakin, "Updating Vision: California 2010 -- Transportation Issues". Paper prepared for the California Economic Development Corporation. December 1989; revised February 1990.
165. E. Deakin, "Opportunities and Constraints for Advanced Highway Technologies: A Speculative Analysis" Executive Summary for the Program on Advanced Technologies for the Highway, University of California, Berkeley, October 1989.
166. E. Deakin, "Opportunities and Constraints for Advanced Highway Technologies: A Speculative Analysis". Research Report for the Program on Advanced Technologies for the Highway, University of California, Berkeley, October 1989.
167. Skabardonis and E. Deakin, "Signal Coordination Technologies". Report prepared for the Metropolitan Transportation Commission, November 1989.
168. E. Deakin, "Future Directions for the Fuel Efficient Traffic Signal Timing Program", Report prepared for the Metropolitan Transportation Commission, November 1989.
169. G. Harvey and E. Deakin with A. Stevens, "Technology Assessment for Transit Priority Systems". Report prepared for the Metropolitan Transportation Commission, December 1989.
170. Skabardonis and E. Deakin, "A Study of Arterial Operational Improvements: Preliminary Recommendations". Report prepared for the Metropolitan Transportation Commission, December 1989.
171. Skabardonis, E. Deakin, and G. Harvey with A. Stevens, "A Study of Arterial Operational Improvements: Detailed Feasibility Analysis Using San Pablo Avenue as a Case Study". Report prepared for the Metropolitan Transportation Commission, May 1990.
172. Skabardonis, E. Deakin, and G. Harvey with A. Stevens, "A Study of Arterial Operational Improvements: Final Report." Report prepared for the Metropolitan Transportation Commission, May 1990.
173. E. Deakin, "Implementing Transportation Control Measures". Paper prepared for the Metropolitan Transportation Commission, May 1990.

**1988-89**

174. E. Deakin, "Transportation, Transportation Budgets, and Women's Agendas: Getting Action on Our Concerns", California Elected Women's Association for Education and Research (CEWAER) Newsletter, Summer 1989.
175. E. Deakin, "Draft Santa Barbara-Goleta Transportation Demand Management Ordinance", prepared for the City of Santa Barbara and Santa Barbara County, June 1989.
176. E. Deakin, "Transportation and Air Quality in California: A Policy Analysis". Report Prepared for the Assembly Office of Research, April 1989.
177. E. Deakin, "State Programs for Managing Land Use, Growth, and Fiscal Impact". Report Prepared for the Senate Office of Research, April 1989.

178. E. Deakin, "Transportation Planning Abroad: Examples from Developed Countries", paper prepared for the Women's Transportation Seminar National Conference, San Francisco, May 19, 1989.
179. E. Deakin, "Transportation and Land Use Planning in California: Issues and Policy Options", paper prepared for the Senate Budget and Fiscal Review Committee Retreat, California Policy Seminar, University of California at Berkeley, Feb. 3, 1989.
180. E. Deakin, "Mapping Traffic Mitigation Actions to Objectives", paper prepared for the Transportation Research Board Transportation and Land Development Conference, Stone Mountain, GA, October 1988.
181. E. Deakin, "Marin County-wide TSM Program -- The Joint Powers Option", paper prepared for Marin County, November 1988.
182. E. Deakin, "Draft Ordinance Establishing a Marin County-wide TSM Program", prepared for Marin County, August 1988.
183. E. Deakin, "Draft Traffic Management Ordinance -- City of Pasadena", prepared for the City of Pasadena, August 1988.

#### **1987-88**

184. E. Deakin, and R. Singh, "The Fuel Efficient Traffic Signal Management Program: Evaluation of Fourth and Fifth Grant Cycles", UCB Research Report ITS-RR-88-8, March 1988.
185. E. Deakin, "Issues and Opportunities for Transit: An Exploration of Changes in the External Environment and Land Use and Development Trends". Background paper prepared for the Transit 2000 Project, American Public Transit Association, January 1988.
186. E. Deakin, "Transportation and Land Use Planning in California: Problems and Opportunities for Improved Performance". Paper prepared for the Assembly Office of Research, State of California. January 1988.
187. E. Deakin and J. Glazer, "Model Trip Reduction Ordinance", prepared for the Orange County Transportation Commission, Orange, CA, 1988.
188. E. Deakin, "Transportation and Economic Development: Recommended Options for California", Report prepared for the California Economic Development Corporation, September 1987.
189. E. Deakin, "Transportation and Economic Development: Recommended Options for California", Summary Report for the California Economic Development Corporation, October 1987.
190. Skabardonis and E. Deakin, "Assessment of the Benefits from Signal Hardware Improvements," paper prepared for the California Department of Transportation, July 1987.

#### **1986-87**

191. M. Kuntemeyer, E.A. Deakin and A. Skabardonis, "Survey on Signal Equipment and Hardware Needs: Results and Recommendations," UCB Research Report ITS-RR-87-5, prepared for California Department of Transportation, June 1987.
192. E. Deakin, R. Singh, and A. Skabardonis, "Local Governments' Safety Projects: Development and Application of an Evaluation Approach," Research Report, prepared for California Department of Transportation, June 1987.
193. E. Deakin, "Air Quality Elements in General Plans: Some Comments on Focusing on Transportation and Land Use Options," paper prepared for the CEQA Air Quality Workshop, Oakland, CA, May 28-29, 1987.
194. E. Deakin, "Transportation System Management Ordinances: An Overview," paper prepared for the Fourth Annual Association of Commuter Transportation, Southern California Regional Conference, Long Beach, CA, May 7-8, 1987.

195. E. Deakin, "Use of Special Assessments for Transportation Demand Management Programs," paper prepared for Orange County Transportation Commission, May 1987.
196. E. Deakin, "Traffic Control Strategies for Suburban Development," paper prepared for the conference "Build and Rebuild: Responding to New Realities of Highway Financing," Irvine, CA, April 9-10, 1987.
197. E. Deakin, "TSM Strategies for Marin County," working paper prepared for Marin County, February 1987.
198. E. Deakin, "Transportation in California: Problems and Policy Options Through the Year 2000," paper prepared for the California Assembly Office of Research, ITS-WP-87-4, Fall 1986 (revised Spring 1987).

#### **1985-86**

199. Skabardonis and E. Deakin, "Training Course for the PASSER II Signal Timing Model," report prepared for the California Department of Transportation, March 1986.
200. E. Deakin, A. Skabardonis and G. Harvey, "Tiburon Blvd. Traffic Analysis," report prepared for the Town of Tiburon, January 1986.
201. E. Deakin and R.W. Lee, with W.L. Garrison, "Private Sector Involvement in Local Transportation Projects: Local Government Requirements and Incentives," report prepared for the U.S. Department of Transportation, April 1986.
202. E. Deakin and W.L. Garrison, "The Future of the American Transportation Industries," report prepared for the Office of Technology Assessment, U.S. Congress, October 1985.
203. E. Deakin and A. Skabardonis, "The Fuel Efficient Traffic Signal Management Program: Evaluation of the Second and Third Funding Cycles," Final Report to the California Department of Transportation, UCB Research Report ITS RR 85 14, October 1985.
204. E. Deakin and A. Skabardonis, "The Future of the FETSIM Program," UCB Research Report ITS RR 85 13, October 1985.
205. E. Deakin and A. Skabardonis, "The Fuel Efficient Traffic Signal Management Program: Three Years of Experience," prepared for the California Energy Commission, December 1985.

#### **January - June 1985**

206. E. Deakin, A. Skabardonis and C. Monsen, "Market Potential for the Fuel Efficient Traffic Signal Management Program," ITS WP 85 8, June 1985.
207. E. Deakin and A. Skabardonis, "Assessing the Traffic Impacts of Transportation and Land Development Scenarios," ITS WP 85 8, June 1985.
208. E. Deakin with W.L. Garrison, "Private Sector Funding for Urban Transportation: Some Comments on Public Private Partnerships," ITS WP 85 9, June 1985.
209. E. Deakin, "Utilitarian Cycling: A Case Study of the Bay Area and Assessment of the Market for Commute Cycling," ITS RR 85 9, March 1985.
210. E. Deakin, C. Monsen, M. Kuntmeyer, A. Skabardonis, and C. Valbuena, "Parking Survey for the U.C. Central Campus: Preliminary Results and Procedural Recommendations," ITS Informal Report, January 1985.
211. Downtown Planning Study Group, "Outline for a Downtown Plan," Berkeley, CA., January 1985, 103 pp. (co author & editor) .

#### **Before 1985 (Reviewed Articles and Papers Only)**

212. E. Deakin, A.D. May, and A. Skabardonis, "Energy Savings From Signal Timing Optimization: Evaluation of California's Statewide Program", Compendium of Technical Papers, 54th Annual Meeting of ITE, San Francisco, Sept. 1984, pp. 13-16 - 13-20.

213. E. Deakin and H.W. Bruck, "Technology Substitution for Air Quality Improvement," in "Transportation and the 1977 Clean Air Act Amendments," Proceedings of the ASCE Specialty Conference, November 1980.
214. E. Deakin, "Private Sector Roles in Urban Transportation," ITS Review, vol. 8, Nov. 1984, pp. 4-8.
215. E. Deakin, "Transportation Issues in Economic Development", in Economic Development in Berkeley, published by the Institute for Social Change, University of California, Berkeley, Fall 1983, pp. 31-42.
216. E. Deakin, "Transportation, Air Quality, and the Clean Air Act," Forefront, College of Engineering, University of California, 1981.
217. E. Deakin, "Transportation in Berkeley: Energy Saving Alternatives," paper prepared for the public forum "Emerging Transportation Priorities for the 1980s," organized for U.S. Secretary of Transportation Neil Goldschmidt, March 20, 1980.
218. E. Deakin, "Traffic Restraints in the San Francisco Bay Area", Transportation Research Record 731, 1979.
219. J.H. Suhrbier, T.J. Atherton, and E. Deakin, "Improved Air Quality through Transportation System Management", Transportation Research Record 722, 1979.
220. E. Deakin, "Air Quality Considerations in Transportation Planning," Transportation Research Record 670, 1978.
221. E. Deakin, "Transport Institutions and Energy Conservation," in "Transportation and Energy", Proceedings of the ASCE Specialty Conference, May 1978.
222. G.W. Harvey and E. Deakin, "State and Local Roles in Transportation Control Planning," Transportation Research Record 599, 1977.
223. M. Manheim, J. Suhrbier, E. (Bennett) Deakin, et al., "Transportation Decision Making: A Guide for Social and Environmental Considerations", National Cooperative Highway Research Program Report 156, MIT, 1975.
224. M. Manheim and E. (Bennett) Deakin, "The Air Quality Standards: A Potential for Improving Local and State Decision Making", Workshop on Transportation and Air Pollution Control, sponsored by Congressional Research Service of the Library of Congress for the Sub-committee on Air and Water Pollution, Committee on Public Works, U.S. Senate, 1974.

**Published Plans:**

225. Communications Hill, San Jose, CA - prime contractors Solomon Architecture and Planning, member of design team (responsible for transportation elements); in Peter Katz, The New Urbanism: Toward an Architecture of Community, McGraw Hill, 1994, pp. 78-87, credits pp. 233-234
226. Downtown Hayward, Hayward, CA - prime contractors Solomon Architecture and Planning, member of design team (responsible for transportation elements); in Peter Katz, op. cit., pp. 127-133; credits p. 235
227. Calvine Specific Area Plan, Sacramento, CA; prime contractors Calthorpe Associates; member of design team (responsible for transportation elements); in Peter Calthorpe, The Next American Metropolis: Ecology, Community, and the American Dream, Princeton Architectural Press, 1993, pp. 150-151, credits p. 173.
228. Loomis Town Center Plan, Placer County, CA; prime contractors Calthorpe Associates; member of design team (responsible for transportation elements); in Peter Calthorpe, op. cit., pp. 167-168; credits p.174.

**Attachment B. Confirmation of Negotiated Overhead and Fringe Benefit Rates.**

A copy of the University of California's most recent negotiated overhead rates and fringe benefit rates, including the name and telephone number of the cognizant federal audit agency representative, can be found at:

<http://www.spo.berkeley.edu/Policy/fa.pdf>.