

| <b>UTC Project Information</b>        |   |
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| Project Title                         | Leader-follower games with no-regret learning agents.   |
| University                            | UC Berkeley   |
| Principal Investigator                | Alexandre Bayen   |
| PI Contact Information                | <a href="mailto:bayen@berkeley.edu">bayen@berkeley.edu</a>  |
| Funding Agencies                      | DOT   |
| Agency ID or Contract Number          | DTRT12-G-UTC09  |
| Project Cost                          | \$66,506.00   |
| Start and End Dates                   | FY2012-2013   |
| Project Duration                      | N/A: Project in progress  |
| Brief Description of Research Project | <p>We propose to develop an optimization framework for problems involving repeated games with large populations of players, such as leader-follower games in which a central coordinator (leader) has control over some parameters of the game, and the remaining players (followers) make selfish decision in response to the leader's action.</p> <p>We are interested in particular in populations that act as no-regret optimizers. This model offers several desirable properties: no-regret learning can be implemented using very simple and realistic algorithms, and under mild assumptions, the resulting sequence of player strategies can be shown to converge to Nash equilibria for some classes of games, such as routing games.</p> <p>We also show connections with online-learning, and evolutionary game theory, which is used to model player population dynamics.</p> <p>We will develop a framework for simulating the evolution of the dynamics of such populations, and build an optimization framework for solving optimal control problem for leader-follower games, in which the leader is a social optimizer, and the followers are no-regret learners.</p> <p>Applications include: routing games in which a Traffic Management Center (leader) controls some network parameters (such as tolls) while the drivers (followers)</p> |

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|  | choose routes that minimize the individual costs.  |
| Describe Implementation of Research Outcomes (or why not implemented)<br><br>Place Any Photos Here | We started implementation of a simulation framework that is used to simulate interaction of populations of players that are playing no-regret strategies, as well as an optimization framework to compute optimal control strategies for social optimizers (e.g. in routing problems, compute optimal tolls or optimal flow allocations) |
| Impacts/Benefits of Implementation (actual, not anticipated)                                       | N/A: Project in progress   |
| Web Links <ul style="list-style-type: none"> <li>• Reports</li> <li>• Project Website</li> </ul>   | N/A: Project in progress   |

| <b>UTC Project Information</b>        |   |
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| Project Title                         | Bus Stops near Signalized Intersections: Analytical Models, Management Strategies and Design Guidelines   |
| University                            | UC Berkeley   |
| Principal Investigator                | Michael Cassidy   |
| PI Contact Information                | <a href="mailto:cassidy@ce.berkeley.edu">cassidy@ce.berkeley.edu</a>  |
| Funding Agencies                      | DOT   |
| Agency ID or Contract Number          | DTRT12-G-UTC09  |
| Project Cost                          | \$79,481.00   |
| Start and End Dates                   | FY2012-2013   |
| Project Duration                      | N/A: Project in progress  |
| Brief Description of Research Project | <p>Curbside bus stops are often located in close proximity to signalized intersections. A bus that dwells at a stop of this kind can impede queued cars upstream as they attempt to discharge into the intersection during green times. This state of affairs adds to the delay and queueing of cars, which in turn can negatively impact the bus. We seek to formulate analytical models that quantify these negative impacts of bus-stop operation. The models will be developed using kinematic wave theory, and we envision very general models that can be applied: to bus stops that are located either upstream or downstream of their neighboring intersections; and to wide ranges of car and bus demand and roadway geometry. We will use the models to theoretically explore innovative bus-stop management strategies. Our goal here is to devise strategies that improve travel for both buses and cars. Model predictions will be tested against simulation and real observation. Finished products will include a set of guidelines to assist practitioners in determining both, where to place bus stops relative to intersections, and how to manage the buses and cars at and around these stops in greener ways.</p> |

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| <p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p> | <p>We will collect field data and conduct “natural experiments” of our control strategies. These natural experiments will demonstrate the benefits of implementing our ideas.</p> |
| <p>Impacts/Benefits of Implementation (actual, not anticipated)</p>                                       | <p>NA</p>   |
| <p>Web Links</p> <ul style="list-style-type: none"><li>• Reports</li><li>• Project Website</li></ul>      | <p><a href="http://www.sciencedirect.com/science/article/pii/S0191261512001233">http://www.sciencedirect.com/science/article/pii/S0191261512001233</a></p>                        |

| <b>UTC Project Information</b>   |   |
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| Project Title  | Transit Access and Egress via Bicycle Sharing   |
| University   | UC Berkeley, CSU Pomona, CSU San Luis Obispo  |
| Principal Investigator   | Carlos Daganzo  |
| PI Contact Information   | <a href="mailto:daganzo@ce.berkeley.edu">daganzo@ce.berkeley.edu</a>  |
| Funding Agencies   | CalTrans  |
| Agency ID or Contract Number   | 7918, 8072  |
| Project Cost   | \$136,380.00  |
| Start and End Dates  | FY2012-2013   |
| Project Duration   | N/A: Project in progress  |
| Brief Description of Research Project  | <p>The work will explore the benefits of designing bicycle-sharing programs to serve public mass transit. Given that bicycle speeds exceed those of walking, a transit system's ridership can increase by promoting bicycle travel to and from its stations. And bicycle sharing may reduce transit costs, especially if the bike-sharing and transit systems can be designed in joint fashion. Researchers at UC Berkeley will use continuum approximation models to design these systems for a pre-defined set of idealized scenarios. Researchers from CSU Pomona will: (i) alter these idealized designs to suit real transit systems in California, (ii) estimate what would be the resulting added ridership for these real systems, and (iii) evaluate the altered designs using simulation. Finally, researchers at CSU San Luis Obispo will identify policies to promote the deployment of our ideas in real settings.</p> |
| Describe Implementation of Research Outcomes (or why not implemented)<br><br>Place Any Photos Here | <p>The expected results of this project include guidelines for design, operation and policy making for bicycle sharing systems that serve transit. Due to the limited time and budget, real-world implementation will not be conducted in the project duration. Instead, simulation of real sites will be performed to verify and demonstrate the potential benefits that could have been achieved if our ideas are implemented in the real world.</p>  |

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| Impacts/Benefits of Implementation<br>(actual, not anticipated)                               | NA                       |
| Web Links <ul style="list-style-type: none"><li>• Reports</li><li>• Project Website</li></ul> | N/A: Project in progress |

| <b>UTC Project Information</b>        |   |
|---------------------------------------|---|
| Project Title                         | Air Emission Reduction Opportunities for California's Trucking Sector by 2020 and 2050  |
| University                            | UC Berkeley   |
| Principal Investigator                | Arpad Horvath   |
| PI Contact Information                | <a href="mailto:horvath@ce.berkeley.edu">horvath@ce.berkeley.edu</a>  |
| Funding Agencies                      | DOT   |
| Agency ID or Contract Number          | DTRT12-G-UTC09  |
| Project Cost                          | \$78,716.00   |
| Start and End Dates                   | FY2012-2013   |
| Project Duration                      | N/A: Project in progress  |
| Brief Description of Research Project | <p>California is the largest consumer of transportation fuels in the United States. An increasing fraction of these fuels (25% - 29%) are dedicated to powering heavy-duty trucks, which has significant effects to both air quality and the climate. Current technologies aiming at reducing emissions focus primarily on improved fuel efficiency. However, massive transformations to our current fuel technologies will be needed in order to meet California's long-term air emissions goals. Alternately fueled vehicles (AFV) will have to play an important role in mitigating the environmental burdens associated with California's heavy-duty freight trucking sector. We will conduct a study that will create a complete inventory of greenhouse gas and criteria air emissions attributed to heavy-duty trucks using life-cycle assessment models. The fuels analyzed will be natural gas, biodiesel, ethanol, and oil sands as a new source of fossil fuels. Current environmental inventories focus on tailpipe emissions, excluding key components of a truck's life cycle: fuel production, manufacturing, and maintenance. We will provide life-cycle emission factors for California's future AFVs. With these emission factors, we will create emission scenarios that compare business-as-usual performance with near-term efficiency-focused strategies and accelerated AFV deployment in the context of meeting</p> |

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|  | California's 2020 and 2050 climate and air quality goals. |
| Describe Implementation of Research Outcomes (or why not implemented)<br><br>Place Any Photos Here | N/A: Project in progress                                  |
| Impacts/Benefits of Implementation (actual, not anticipated)                                       | N/A: Project in progress                                  |
| Web Links <ul style="list-style-type: none"> <li>• Reports</li> <li>• Project Website</li> </ul>   | N/A: Project in progress                                  |

| <b>UTC Project Information</b>        |  |
|---------------------------------------|--|
| Project Title                         | A Comparative Analysis of Pedestrian and Bicyclist Safety Around University Campuses   |
| University                            | UC Berkeley, UC Los Angeles, CSU Sacramento  |
| Principal Investigator                | David Ragland  |
| PI Contact Information                | <a href="mailto:davidr@berkeley.edu">davidr@berkeley.edu</a>   |
| Funding Agencies                      | CalTrans   |
| Agency ID or Contract Number          | 8067, 7916   |
| Project Cost                          | \$145,459.00   |
| Start and End Dates                   | FY2012-2013  |
| Project Duration                      | N/A: Project in progress   |
| Brief Description of Research Project | <p>College campuses and their peripheries are mixed-use environments in which the academic center serves as the core and is surrounded by retail, entertainment, and high-density residential facilities. The result is a multi-modal environment with very high walking and biking in conjunction with high vehicle traffic, which increases the potential conflict between the different transportation modes and may create relatively high risk and discomfort for pedestrians and bicyclists. Our proposed study will provide a comparative analysis of pedestrian and bicycle safety in and around three different campuses with the explicit goal of identifying possible relationships between urban form and traffic characteristics of the micro-environment and the incidence of crashes. To accomplish this, we have chosen to focus on three different campuses: (i) University of California Berkeley; ii) University of California Los Angeles; and (iii) California State University Sacramento. Using approaches from public health, planning, engineering and urban design, we will examine crash data and urban form data from all three campuses and study the spatial and temporal distribution of pedestrian and bicycle crashes in each campus in order to identify whether characteristics of the built environment contribute to the incidence of pedestrian and bicycle crashes, and suggest design changes to improve</p> |

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|  | pedestrian and cycling safety in these areas. |
| Describe Implementation of Research Outcomes (or why not implemented)<br><br>Place Any Photos Here | N/A: Project in progress                      |
| Impacts/Benefits of Implementation (actual, not anticipated)                                       | N/A: Project in progress                      |
| Web Links <ul style="list-style-type: none"><li>• Reports</li><li>• Project Website</li></ul>      | N/A: Project in progress                      |

| <b>UTC Project Information</b>        |  |
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| Project Title                         | Peer-to-Peer (P2P) Carsharing: Understanding Early Market Dynamics and Social and Environmental Impacts  |
| University                            | UC Berkeley  |
| Principal Investigator                | Susan Shaheen  |
| PI Contact Information                | <a href="mailto:sashaheen@tsrc.berkeley.edu">sashaheen@tsrc.berkeley.edu</a>   |
| Funding Agencies                      | DOT  |
| Agency ID or Contract Number          | DTRT12-G-UTC09   |
| Project Cost                          | \$70,849.00  |
| Start and End Dates                   | FY2012-2013  |
| Project Duration                      | N/A: Project in progress   |
| Brief Description of Research Project | <p>As traditional carsharing has become an integral part of urban transportation systems across North America, new and advanced approaches to carsharing have begun to emerge. One such advance is peer-to-peer (P2P) carsharing, in which ITS technology opens personally-owned vehicles to carsharing. This project would study early P2P carsharing members through focus groups, stakeholder interviews, and an online survey. Focus groups would probe the experiences of members that contribute and rent vehicles to understand the obstacles faced in sharing P2P vehicles. The focus groups would also inform the design of an online survey of members across P2P organizations in North America. Questions would explore how P2P carsharing has altered member walking, bicycling, public transportation, personal driving, and ridesharing. Researchers would identify benefits/positive experiences and challenges/frustrations faced by P2P users/vehicle renters to inform the P2P industry of early adopter considerations. Finally, stakeholder interviews with operators and key supporters (e.g., legislators) would gain perspective on industry challenges and opportunities from a policy perspective. The results would be used to advance knowledge of P2P carsharing and aid organizations in expanding their</p> |

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|  | vehicle networks through a better understanding of the fundamental needs and characteristics of their membership base as related to the broader population. |
| Describe Implementation of Research Outcomes (or why not implemented)<br><br>Place Any Photos Here | N/A: Project in progress  |
| Impacts/Benefits of Implementation (actual, not anticipated)                                       | N/A: Project in progress  |
| Web Links <ul style="list-style-type: none"> <li>• Reports</li> <li>• Project Website</li> </ul>   | N/A: Project in progress  |

| <b>UTC Project Information</b>        |   |
|---------------------------------------|---|
| Project Title                         | After SB375: Using Statewide Activity-Based Modeling to Assess the Impact of Sustainable Community Strategies on Regional and Interregional Travel Behavior   |
| University                            | UC Davis  |
| Principal Investigator                | Giovanni Circella   |
| PI Contact Information                | <a href="mailto:gcircella@ucdavis.edu">gcircella@ucdavis.edu</a>  |
| Funding Agencies                      | DOT   |
| Agency ID or Contract Number          | 7868  |
| Project Cost                          | \$75,000.00   |
| Start and End Dates                   | FY2012-2013   |
| Project Duration                      | N/A: Project in progress  |
| Brief Description of Research Project | <p>This research project proposes using the advanced statewide activity based travel demand model CSTDM, in combination with the more detailed interregional model SJVITM, for the evaluation of the impact of land use policies on travel behavior in California. Senate Bill 375 requires local metropolitan planning organizations (MPOs) in California to develop Sustainable Community Strategies (SCSs) to promote transportation investments and land use policies that reduce VMT and car use dependence. However, still little evidence is available on the expected results of these policies. In particular, the effects on the border regions between MPOs are not easy to estimate. In addition, contemporaneous changes in the transportation system (e.g. fuel prices, modifications in vehicle fleets and transit supply) might create synergies that are, to date, largely unexplored. The use of the proposed modeling framework, which simulates all components of long distance and short distance travel, for both passengers and goods, will provide a consistent interregional framework for this analysis. The project will provide useful insights on the overall impact of land use policies on regional and interregional travel behavior, and it will contribute to the transfer of knowledge to the community of policy-</p> |

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|  | makers to support more informed decision-making. |
| Describe Implementation of Research Outcomes (or why not implemented)<br><br>Place Any Photos Here | N/A: Project in progress                         |
| Impacts/Benefits of Implementation (actual, not anticipated)                                       | N/A: Project in progress                         |
| Web Links <ul style="list-style-type: none"><li>• Reports</li><li>• Project Website</li></ul>      | N/A: Project in progress                         |

| <b>UTC Project Information</b>        |   |
|---------------------------------------|---|
| Project Title                         | Davis Shopping Study: Factors Influencing Impacts of Big-Box Retail on Shopping Travel  |
| University                            | UC Davis  |
| Principal Investigator                | Susan Handy   |
| PI Contact Information                | <a href="mailto:slhandy@ucdavis.edu">slhandy@ucdavis.edu</a>  |
| Funding Agencies                      | DOT   |
| Agency ID or Contract Number          | 7868  |
| Project Cost                          | \$65,000.00   |
| Start and End Dates                   | FY2012-2013   |
| Project Duration                      | N/A: Project in progress  |
| Brief Description of Research Project | <p>Shopping travel constitutes a significant share of all daily travel in the U.S. This travel has significant environmental impacts with respect to energy consumption, air quality, water quality, and climate change. Understanding the factors that influence choices about shopping provides a basis for the development of policies that help ensure that consumer needs are met while the environmental costs of shopping travel are minimized. The purpose of this study is to examine shopping behavior of residents of Davis, CA before and after the opening of a Target store in Davis in 2009. The opening of the store presented a unique opportunity to study the causal effects on shopping behavior of a significant change in the retail landscape. We completed a survey of Davis residents as to their shopping travel just before the opening of the store and one year after the store opening. Using data from this survey, we have estimated a significant reduction in vehicle miles of travel for shopping purposes for Davis residents. These results are relevant to current policy debates in California over the role of “smart growth” planning policies in reducing greenhouse gas emissions as a way to meet Senate Bill 375 requirements.</p> |
| Describe Implementation of            | N/A: Project in progress  |

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| Research Outcomes (or why not implemented)<br><br>Place Any Photos Here                       |                          |
| Impacts/Benefits of Implementation (actual, not anticipated)                                  | N/A: Project in progress |
| Web Links <ul style="list-style-type: none"><li>• Reports</li><li>• Project Website</li></ul> | N/A: Project in progress |

| <b>UTC Project Information</b>        |  |
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| Project Title                         | From Development to Implementation of Social Equity Metrics and Scenarios for Sustainable Communities Strategies in the San Joaquin Valley   |
| University                            | UC Davis   |
| Principal Investigator                | Jonathan London, Chris Benner, Deb Niemeier  |
| PI Contact Information                | <a href="mailto:jk london@ucdavis.edu">jk london@ucdavis.edu</a>   |
| Funding Agencies                      | DOT  |
| Agency ID or Contract Number          | 7868   |
| Project Cost                          | \$65,000.00  |
| Start and End Dates                   | FY2012-2013  |
| Project Duration                      | N/A: Project in progress   |
| Brief Description of Research Project | <p>The proposed project seeks to: (1) refine for use in the San Joaquin Valley a set of existing social equity analysis tools applicable to sustainable regional development policy and planning that have been developed in the Bay Area and Sacramento regions; (2) apply these tools to inform social equity and health scenario development for use in regional planning related to SB 375 (Sustainable Communities Strategies/Metropolitan Transportation Plans) by Councils of Governments (COGs) and community advocates in the San Joaquin Valley; and (3) conduct a formative assessment of the scenario development and tool application process.</p> <p>These tools, including a Social Vulnerability Index, an Opportunity Index, a Jobs-Housing fit analysis, a Cumulative Environmental Hazard Index and a Transportation Equity Index, have been developed and applied in SB 375-related planning in the Sacramento and San Francisco Bay Area regions. Equity advocates in the San Joaquin Valley have requested assistance from UC Davis to work collaboratively with them and with the COGs in the region to apply these tools and develop equity scenarios for the region's Sustainable Communities Strategies/Metropolitan Transportation Plans.</p> |

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| <p>Describe Implementation of Research Outcomes (or why not implemented)</p>                            | <p>The Center for Regional Change team has developed and/or refined several innovative tools for analyzing and visualizing social equity in the context of regional transportation, housing, and land use planning. These tools include:</p> <ul style="list-style-type: none"> <li>• Jobs/Housing fit (analysis of the ratio of affordable housing and low-wage jobs) to guide housing planning.</li> <li>• Community Opportunity and Community Vulnerability Index prioritized the places that need and would most benefit from investment</li> <li>• Social equity analysis of transportation models</li> <li>• Health impact analysis of transportation plans</li> <li>• Political power analysis of key regional planning stakeholders</li> </ul> |
| <p>Impacts/Benefits of Implementation</p>   | <p>Regional equity advocates have used our social equity tools to guide and enhance their engagement in the development of Sustainable Community Strategy/ Metropolitan Transportation plans in the San Joaquin Valley. In particular, advocates have used the tools to inform the selection of initial indicators for the SCS development, the broader definition of the SCS scenarios, and the future analysis (EIR) of the preferred scenario.</p>  |
| <p>Web Links</p> <ul style="list-style-type: none"> <li>• Reports</li> <li>• Project Website</li> </ul> | <p><a href="http://mappingregionalchange.ucdavis.edu/taxonomy/term/89">http://mappingregionalchange.ucdavis.edu/taxonomy/term/89</a><br/> <a href="http://mappingregionalchange.ucdavis.edu/taxonomy/term/87">http://mappingregionalchange.ucdavis.edu/taxonomy/term/87</a></p>  |

| <b>UTC Project Information</b>        |   |
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| Project Title                         | Social Networks and Travel Behavior: A Comparative Analysis   |
| University                            | UC Davis  |
| Principal Investigator                | Mark Lubell   |
| PI Contact Information                | <a href="mailto:mnlubell@ucdavis.edu">mnlubell@ucdavis.edu</a>  |
| Funding Agencies                      | DOT   |
| Agency ID or Contract Number          | 7868  |
| Project Cost                          | \$75,000.00 – Reduced to \$40,000 due to NSF GRF funding for graduate student Susan Pike  |
| Start and End Dates                   | FY2012-2013   |
| Project Duration                      | N/A: Project in progress  |
| Brief Description of Research Project | <p>Using a comparative approach, this project explores how social networks influence travel behavior at three, large public universities that differ in environmental constraints such as climate, infrastructure and city/university-wide transportation culture. Focus groups and interviews of students and transportation policy decision-makers provide qualitative context for survey design and statistical analysis. Surveys of random samples of students provide measures of mode choice, as well as the “egonetworks” of contacts with whom each respondent communicates about transportation choices. Analysis includes measurement of network structures such as network density and centrality. Discrete choice models are estimated to predict travel mode as a function of individual characteristics as well as social networks attributes. Models from each university are compared to identify environmental factors which affect how social influences impact travel behavior. A key comparative hypothesis is that the influence of social networks is smaller in contexts with greater environmental constraints; high levels of environmental constraints make social networks less relevant. A greater understanding of the social processes that influence travel behavior can help improve policy and education programs designed to increase the use of alternative transportation modes</p> |

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|  | and sustainable transportation behaviors. |
| Describe Implementation of Research Outcomes (or why not implemented)<br><br>Place Any Photos Here | N/A: Project in progress                  |
| Impacts/Benefits of Implementation (actual, not anticipated)                                       | N/A: Project in progress                  |
| Web Links <ul style="list-style-type: none"><li>• Reports</li><li>• Project Website</li></ul>      | N/A: Project in progress                  |

| <b>UTC Project Information</b>        |  |
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| Project Title                         | Activities Conducted while Traveling: What is Their Impact on Mode Choice and the Value of Travel Time?  |
| University                            | UC Davis   |
| Principal Investigator                | Patricia Mokhtarian  |
| PI Contact Information                | <a href="mailto:plmokhtarian@ucdavis.edu">plmokhtarian@ucdavis.edu</a>   |
| Funding Agencies                      | DOT  |
| Agency ID or Contract Number          | 7868   |
| Project Cost                          | \$85,000.00  |
| Start and End Dates                   | FY2012-2013  |
| Project Duration                      | N/A: Project in progress   |
| Brief Description of Research Project | <p>From early studies of time allocation onward, it has been acknowledged that the “productive” nature of an activity such as travel could affect its utility. Yet until recently, there has been very little empirical assessment of such an effect, in particular the potential effect of activities conducted while traveling on the (dis)utility of the trip and thence the value of travel time for such a trip. In previous phases of this multi-year study, we developed a fundamental conceptualization of polychronicity (multitasking) attitudes and behavior, and created and administered a survey to measure multitasking attitudes and behavior specifically while commuting, together with general attitudes, mode-specific perceptions, and standard socioeconomic traits (N = approximately 3020 Northern California commuters). This proposed continuation of the research will fund the development of first-of-their-kind revealed preference mode choice models accounting for the impact of multitasking attitudes and behavior on the utility for various alternatives. The resulting insights will inform and improve policies and services promoting more sustainable forms of travel, and lead to more realistic models and forecasts.</p> |
| Describe Implementation of            | N/A: Project in progress   |

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| Research Outcomes (or why not implemented)<br><br>Place Any Photos Here                       |   |
| Impacts/Benefits of Implementation (actual, not anticipated)                                  | N/A: Project in progress  |
| Web Links <ul style="list-style-type: none"><li>• Reports</li><li>• Project Website</li></ul> | <a href="http://www.its.ucdavis.edu/?page_id=10063&amp;pub_id=1802">http://www.its.ucdavis.edu/?page_id=10063&amp;pub_id=1802</a><br>(A report describing the collection of the data being analyzed in the present project)<br><a href="http://www.its.ucdavis.edu/?page_id=10063&amp;pub_id=1845">http://www.its.ucdavis.edu/?page_id=10063&amp;pub_id=1845</a><br>(A report on a companion study to this project) |

| <b>UTC Project Information</b>        |   |
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| Project Title                         | Capacity Reallocation Projects and Their Perceived Effects on Local Economics, Sustainability, Livability   |
| University                            | UC Davis  |
| Principal Investigator                | Deb Niemeier  |
| PI Contact Information                | <a href="mailto:dniemeier@ucdavis.edu">dniemeier@ucdavis.edu</a>  |
| Funding Agencies                      | DOT   |
| Agency ID or Contract Number          | 7868  |
| Project Cost                          | \$47,000.00   |
| Start and End Dates                   | FY2012-2013   |
| Project Duration                      | N/A: Project in progress  |
| Brief Description of Research Project | <p>With increasing federal and state policies and funding support mechanisms for non-motorized transportation, an important opportunity exist to further our understanding around design and implementation issues associated with these projects. Many communities are exploring capacity reallocation projects, which generally take the form of reducing an existing multi-lane road (usually four-lanes) to two vehicle-lanes, and adding a center left hand turn lane and dedicated bike and pedestrian paths in both directions. Although capacity reallocation projects are becoming a more widely applied mode shift strategy, there is very little research on the impact of these types of projects on non-safety factors. This research will contribute by expanding our understanding of how businesses judge the economic impacts of road diets and how previously surveyed respondents and their initial project opinions may have changed over time and as construction has become eminent. Our proposed project builds on a prior UCTC supported effort that focused on a pre-implementation data collection and analysis for a capacity reallocation project within the City of Davis. The project was referred to as the 5th Street Redesign. Our current UCTC support focused on capturing attitudes and perceptions as well as characterizing existing operating conditions as the 5th Street Redesign from</p> |

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|   | <p>the public participation stage through final design. Here, we focus on business perceptions and attitudes as implementation nears, which is scheduled for Sept 2013.</p> |
| <p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p> | N/A: Project in progress  |
| <p>Impacts/Benefits of Implementation (actual, not anticipated)</p>                                       | N/A: Project in progress  |
| <p>Web Links</p> <ul style="list-style-type: none"> <li>• Reports</li> <li>• Project Website</li> </ul>   | N/A: Project in progress  |

| <b>UTC Project Information</b>        |  |
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| Project Title                         | Modeling Traffic Flow at Merge Bottlenecks<br>Considering Merging Location Choice  |
| University                            | UC Davis   |
| Principal Investigator                | Michael Zhang  |
| PI Contact Information                | <a href="mailto:hmzhang@ucdavis.edu">hmzhang@ucdavis.edu</a>   |
| Funding Agencies                      | DOT  |
| Agency ID or Contract Number          | 7868   |
| Project Cost                          | \$75,000.00  |
| Start and End Dates                   | FY2012-2013  |
| Project Duration                      | N/A: Project in progress, expected completion date:<br>September 30, 2013  |
| Brief Description of Research Project | <p>Merge bottlenecks, such as lane drops, junctions with entry ramps, and freeway-to-freeway merges, are the most common places where traffic congestion initiates. These are the places where drivers compete for reduced road space and are forced to interact. Furthermore, merge junctions are also fundamental building blocks of networks, hence their models are essential components of network traffic models widely used in dynamic traffic assignment and other network applications. Despite recent renewed interest and progress made in modeling merge bottlenecks, our understanding of and ability to model them is far less mature than those related to traffic on homogeneous road sections, partly due to the complexity of merge dynamics and partly insufficient observations. In this research, we attempt to gain a better understanding of traffic system behavior at merge bottlenecks through careful studies of vehicle trajectories from on-ramp junctions, and use this understanding to develop more realistic merging traffic flow models that takes into account the choice of merging locations. It is expected that this research can help build a solid foundation of network traffic flow theory by addressing an essential component of this theory, namely merging traffic dynamics, which in turn can help the design of more effective traffic control strategies to reduce traffic congestion caused by merge bottlenecks.</p> |

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| <p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p> | <p>Trajectory data from FHWA and NGSIM are processed to study the choice of merging locations as well as acceptable lead and lag merging gaps. Based on the observations, the bi-polar and multipolar merging hypotheses were tested and a bi-polar merge model was implemented in a network LWR model. Merge location choice is found to be an essential reason for the existence of stop-and-go traffic. To be completed by September 30, 2013:Based on findings from data analysis, mandatory lane change strategies will be developed to study drivers' cooperative and competitive interactions and their impact on merging capacity by microscopic simulation with car following models.</p> |
| <p>Impacts/Benefits of Implementation (actual, not anticipated)</p>                                       | <p>N/A: Project in progress</p>  |
| <p>Web Links</p> <ul style="list-style-type: none"> <li>• Reports</li> <li>• Project Website</li> </ul>   | <p>N/A: Project in progress</p>  |

| <b>UTC Project Information</b>   |  |
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| Project Title  | Moving from Interesting to Implementable Models for Efficient Transportation Systems Management – Breaking Through the Computing Barrier   |
| University   | UC Irvine  |
| Principal Investigator   | Amelia Regan   |
| PI Contact Information   | <a href="mailto:aregan@uci.edu">aregan@uci.edu</a>   |
| Funding Agencies   | DOT  |
| Agency ID or Contract Number   | 7869   |
| Project Cost   | \$26,000.00  |
| Start and End Dates  | FY2012-2013  |
| Project Duration   | N/A: Project in progress   |
| Brief Description of Research Project  | In this research we propose to extend a decade or more of research in parallel and distributed computing architecture to work on transportation problems falling into the general category of network design, but with time scales that range from real-time to quasi-real time to quarterly or annual planning. We then propose to extend this work to many other operational problems. |
| Describe Implementation of Research Outcomes (or why not implemented)<br><br>Place Any Photos Here | N/A: Project in progress   |
| Impacts/Benefits of Implementation (actual, not anticipated)                                       | N/A: Project in progress   |
| Web Links <ul style="list-style-type: none"> <li>• Reports</li> <li>• Project Website</li> </ul>   | N/A: Project in progress   |

| <b>UTC Project Information</b>   |   |
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| Project Title  | Improving Transportation Performance: The Case of Left Turns  |
| University   | UC Irvine   |
| Principal Investigator   | Michael McNally   |
| PI Contact Information   | <a href="mailto:mmcnally@uci.edu">mmcnally@uci.edu</a>  |
| Funding Agencies   | DOT   |
| Agency ID or Contract Number   | 7869  |
| Project Cost   | \$26,000.00   |
| Start and End Dates  | FY2012-2013   |
| Project Duration   | N/A: Project in progress  |
| Brief Description of Research Project  | Over the past century, the automobile has evolved to dominate transportation not only from a behavioral perspective but from an infrastructure perspective. Thoroughfares that evolved over millennia to serve many users were transformed in decades to the near exclusive use by motor vehicles. The reasons for this evolution are well documented; alternatives to the behavioral dominance, while numerous in terms of proposals and promise, are nevertheless constrained by the infrastructural dominance. One option that has not been systematically studied but that has the cost advantage of maintaining current infrastructure while addressing associated performance impacts is a significant reduction in allowed arterial left turns. Such a policy will soon become feasible with the rapid adoption of GPS and traveler information systems that can inform drivers of optimal route choice in restricted networks. The proposed research will use a microsimulation approach to investigate a range of left turn restriction and removal options on sample arterial networks, under a range of driver behavior assumptions. |
| Describe Implementation of Research Outcomes (or why not implemented)<br>Place Any Photos Here | N/A: Project in progress  |
| Impacts/Benefits of Implementation (actual, not anticipated)                                   | N/A: Project in progress  |
| Web Links <ul style="list-style-type: none"> <li>• Reports</li> </ul>                          | N/A: Project in progress  |

- Project Website

| <b>UTC Project Information</b>        |   |
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| Project Title                         | Evaluating the Travel and Physical Activity Impacts of the Exposition (Expo) Light Rail Line; Leveraging Transit Investments for Community Livability and Regional Sustainability   |
| University                            | UC Irvine   |
| Principal Investigator                | Douglas Houston   |
| PI Contact Information                | <a href="mailto:Houston@uci.edu">Houston@uci.edu</a>  |
| Funding Agencies                      | DOT   |
| Agency ID or Contract Number          | 7869  |
| Project Cost                          | \$27,330.00   |
| Start and End Dates                   | FY2012-2013   |
| Project Duration                      | N/A: Project in progress  |
| Brief Description of Research Project | <p>This research will support analysis of data collected in California's first experimental-control, before-and-after evaluation of a major light rail transit (LRT) investment, the Exposition (Expo) line from downtown to the westside of Los Angeles. The region's ambitious LRT construction campaign will support Senate Bill SB375 goals for greater integration of transportation and land use planning, but we know little about whether and to what degree new LRT is associated with reduced private vehicle travel and increased transit usage. In Fall 2011, we collected geographically detailed 7-day travel data for 285 households along the corridor using daily trip and vehicle odometer logs and supplemental GPS-based location tracking. We will collect comparable "after" data for the same households in Fall 2012 after the Expo line service begins in Spring 2012. The current proposal will support data coding, processing, and analysis and will inform transit planning and community development by (1) assessing the impact of Expo service on nearby private vehicle travel, transit ridership, and physical activity, (2) identifying neighborhood factors which could enhance the potential positive effects of transit proximity on bus ridership and walking, and (3) demonstrating methods</p> |

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|  | for evaluating the sustainability, travel, and community impacts of major transportation projects. |
| Describe Implementation of Research Outcomes (or why not implemented)<br><br>Place Any Photos Here | N/A: Project in progress   |
| Impacts/Benefits of Implementation (actual, not anticipated)                                       | N/A: Project in progress   |
| Web Links <ul style="list-style-type: none"> <li>• Reports</li> <li>• Project Website</li> </ul>   | N/A: Project in progress   |

| <b>UTC Project Information</b>        |   |
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| Project Title                         | Bounded Acceleration and Capacity Drop at Merging Bottlenecks   |
| University                            | UC Irvine   |
| Principal Investigator                | Wenlong Jin   |
| PI Contact Information                | <a href="mailto:wjin@uci.edu">wjin@uci.edu</a>  |
| Funding Agencies                      | DOT   |
| Agency ID or Contract Number          | 7869  |
| Project Cost                          | \$27,329.00   |
| Start and End Dates                   | FY2012-2013   |
| Project Duration                      | N/A: Project in progress  |
| Brief Description of Research Project | <p>The objective of this research is to prove the conjecture that bounded acceleration rates of vehicles can lead to capacity drop inside a merging area. Capacity drop is one of the most puzzling traffic phenomena occurring near such bottlenecks as lane-drop and merges. While it has been suspected that such a capacity drop is caused by drivers' acceleration behaviors inside various bottleneck areas, there have been no systematic studies on the relationship between drivers' acceleration process and the magnitude of capacity drop. In this research we aim to develop, calibrate, and validate a macroscopic model of acceleration behaviors inside a merging bottleneck and quantify their impacts on capacity drop. From observed vehicles' trajectories, we will calibrate acceleration rates and distances inside such an acceleration zone and calculate the magnitude of capacity drop using the macroscopic acceleration behavior model. The result will be compared with the observed capacity drop from loop detector data. Such a research can improve our understanding of the mechanism and magnitude of capacity drops at freeway bottlenecks. The knowledge can then be employed towards improving ramp metering, variable speed limits, and other control strategies to reduce congestion and vehicle emissions in a road network.</p> |

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| Describe Implementation of Research Outcomes (or why not implemented)<br><br>Place Any Photos Here | N/A: Project in progress |
| Impacts/Benefits of Implementation (actual, not anticipated)                                       | N/A: Project in progress |
| Web Links <ul style="list-style-type: none"><li>• Reports</li><li>• Project Website</li></ul>      | N/A: Project in progress |

| <b>UTC Project Information</b>   |   |
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| Project Title  | Analysis and Synthesis of Electric Vehicle and Charging Data for Multi-Mode Mobility Systems  |
| University   | UC Irvine   |
| Principal Investigator   | Scott Samuelsen   |
| PI Contact Information   | <a href="mailto:gss@uci.edu">gss@uci.edu</a>  |
| Funding Agencies   | DOT   |
| Agency ID or Contract Number   | 7869  |
| Project Cost   | \$26,000.00   |
| Start and End Dates  | FY2012-2013   |
| Project Duration   | N/A: Project in progress  |
| Brief Description of Research Project  | This project will explore PEV use and charging patterns in combination with unique vehicle attributes, to address the limitations of PEV adoption as a function of EVSE availability and explore mixed-mode mobility systems that leverage PEV performance characteristics while minimizing their limitations. Specifically, this project will utilize data available from the Zero Emission Vehicle•Network Enabled Transport program in conjunction with the established Spatially and Temporally Resolved Energy and Environment Tool (STREET) to analyze mixed-mode mobility system utilizing PEVs. |
| Describe Implementation of Research Outcomes (or why not implemented)<br><br>Place Any Photos Here | N/A: Project in progress  |
| Impacts/Benefits of Implementation (actual, not anticipated)                                       | N/A: Project in progress  |

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| <b>Web Links</b> <ul style="list-style-type: none"><li>• Reports</li><li>• Project Website</li></ul> | N/A: Project in progress |
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| <b>UTC Project Information</b>        |   |
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| Project Title                         | Truck Tour-Based Model for Spatial Disaggregation of California Freight Demand  |
| University                            | UC Irvine   |
| Principal Investigator                | Stephen Ritchie   |
| PI Contact Information                | <a href="mailto:sritchie@uci.edu">sritchie@uci.edu</a>  |
| Funding Agencies                      | DOT   |
| Agency ID or Contract Number          | 7869  |
| Project Cost                          | \$26,000.00   |
| Start and End Dates                   | FY2012-2013   |
| Project Duration                      | N/A: Project in progress  |
| Brief Description of Research Project | <p>In recent years the role of statewide freighting forecasting models has been expanded to much finer levels of analysis than regional or even county levels, those being the most disaggregate spatial levels for which public freight data sources are typically available. In partnership with other state agencies and Metropolitan Planning Organizations (MPOs), the California Department of Transportation (Caltrans) is currently developing a California Statewide Freight Forecasting Model (CSFFM). A critical challenge is to provide a framework for organic integration between the CSFFM and a finer spatial level such as that in the new California Statewide Travel Demand Model (CSTDm) to meet Caltrans and MPO needs. However, factoring methods are currently largely used for disaggregating freight demand. Such methods cannot adequately capture the complex structure and behavior of freight movements, advances in logistics, information technology, and relocating infrastructure at the MPO level. One advantage of the CSFFM, modal path-based OD representation, cannot be fully utilized by MPOs because factoring methods tend to break the chains of modal path-based information in the conversion to trip-based information. This research initially sought to explore and develop truck tour-based models for disaggregating CSFFM from an aggregate Freight Analysis Zone (FAZ) level to the more disaggregate Traffic Analysis Zone (TAZ) level in CSTDm, by using truck GPS data from the American Transportation Research Institute (ATRI). Expected results included new and improved insights into the spatial and temporal operations of trucks at the urban and MPO level, contribution to the statewide-related component of urban freight modeling, and an evaluation of traffic and environmental impacts of state-level policies and air pollution mitigation strategies. However, after detailed investigation of the ATRI GPS data it was concluded that several problems with the data made it inadequate for disaggregating a CSFFM truck matrix for about 200 FAZs to the CSTDm 5000 TAZ level. Therefore, a new approach is being developed. It involves estimation of a direct demand model at the CSFFM FAZ level using as inputs only independent variables readily available at CSTDm's level of aggregation and, as dependent variables, the final truck matrices estimated by CSFFM. The model will then be applied to CSTDm's zoning system with the resulting estimates being appropriately scaled to match the input CSFFM matrix (with one scaling factor per cell of</p> |

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|   | <p>the CSFFM truck trip table). This procedure has the following desired properties</p> <ul style="list-style-type: none"> <li>• Maintains consistency with CSFFM (matrices match when aggregated to CSFFM level);</li> <li>• Fast development; and</li> <li>• Requires only the computation of a skim matrix on CSTDM's network.</li> </ul> <p>This procedure also recognizes that there does not appear to be any currently available data to support behavioral assumptions on freight generation and distribution at the spatial level of the CSTDM and, therefore, a method that is simpler in nature and uses data subject to a minimal number of assumptions is clearly preferred.</p> |
| <p>Describe Implementation of Research Outcomes (or why not implemented)<br/>Place Any Photos Here</p>  | <p>N/A: Project in progress</p>   |
| <p>Impacts/Benefits of Implementation (actual, not anticipated)</p>                                     | <p>N/A: Project in progress</p>   |
| <p>Web Links</p> <ul style="list-style-type: none"> <li>• Reports</li> <li>• Project Website</li> </ul> | <p>N/A: Project in progress</p>   |

| <b>UTC Project Information</b>  |  |
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| Project Title   | The Role of Habitat Plans in Facilitating Transportation Infrastructure  |
| University  | UC Los Angeles   |
| Principal Investigator  | Martin Wachs   |
| PI Contact Information  | <a href="mailto:mwachs@ucla.edu">mwachs@ucla.edu</a>   |
| Funding Agencies  | DOT  |
| Agency ID or Contract Number  | 7870   |
| Project Cost  | \$82,163.00  |
| Start and End Dates   | FY2012-2013  |
| Project Duration  | N/A: Project in progress   |
| Brief Description of Research Project                                 | <p>Since the federal Endangered Species Act prohibits any action that causes harm to endangered species or destruction of their habitat, prior to the authorization of Habitat Conservation Plans (HCPs) in 1982, non-federal entities were limited in their ability to proceed with otherwise lawful activities, including transportation infrastructure projects, which might incidentally harm endangered species. HCPs provide a way to move forward on infrastructure projects without fear of criminal or civil endangered species violations by establishing agreed upon conservation or mitigation measures. The proposed research seeks to determine whether HCPs facilitate the delivery of large transportation infrastructure projects undertaken by non-federal entities. The research will involve case studies of six to twelve public HCPs with a specific focus on transportation infrastructure projects and off-site mitigation. The final report will include an assessment of the relationship between HCPs and environmental review processes for large infrastructure projects, and will develop a set of policy implications based on the research findings.</p> |
| Describe Implementation of Research Outcomes (or why not implemented) | N/A: Project in progress   |

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| Place Any Photos Here   |                          |
| Impacts/Benefits of Implementation<br>(actual, not anticipated)                               | N/A: Project in progress |
| Web Links <ul style="list-style-type: none"><li>• Reports</li><li>• Project Website</li></ul> | N/A: Project in progress |

| <b>UTC Project Information</b>        |  |
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| Project Title                         | Honey, Can you pick-up groceries on your way home?<br>Analyzing activities and travel in non-traditional households  |
| University                            | UC Los Angeles   |
| Principal Investigator                | Brian Taylor   |
| PI Contact Information                | <a href="mailto:btaylor@ucla.edu">btaylor@ucla.edu</a>   |
| Funding Agencies                      | DOT  |
| Agency ID or Contract Number          | 7870   |
| Project Cost                          | \$71,561.00  |
| Start and End Dates                   | FY2012-2013  |
| Project Duration                      | N/A: Project in progress   |
| Brief Description of Research Project | <p>Except for walks in the park and cruising on a Saturday night, travel is a means to an end. Economists describe the demand for travel as “derived” because people travel in order to access other things—work, shops, restaurants, friends, and so on. Transportation is often a critical link to education, paid work, recreation, health care, culture, and many other aspects of quality living. While conventional measures like person-miles of travel (PMT) are excellent measures of mobility, they do not tell us much about access, or the utility of personal travel. To examine travel utility or access, we must turn our attention to activity participation—the taking of trips for various purposes. Trip-making is an excellent, albeit indirect and understudied window on activity participation. People’s work habits, shopping behavior, recreational preferences, and so on are revealed by the stated purpose of their travel in surveys like the National Household Travel Survey (NHTS), as well as in activity surveys such as the American Time Use Survey (ATUS). We propose to examine how activity participation differs by household type. This is increasingly relevant as the share of two-sex, married couple households with children continue to decline, while what has been (increasingly misleadingly termed) “non-traditional”</p> |

households continues to grow. How members of this new majority of non-traditional households divide labor, organize activities, and travel about is of critical importance to transportation officials charged with planning for the next generation of travel.

In particular, we aim to add to the existing knowledge of the ways in which sex and gender roles influence activity patterns in households. Numerous scholars have investigated the important differences between men and women in travel and particular outcomes such as employment (e.g. Hanson and Pratt 1991; Hanson and Pratt 1995; McGuckin and Murakami 1999; Blumenberg 2004; Crane 2007), though none have taken a comprehensive look at gender and activity participation more broadly. Further, few researchers have considered the ways in which gender and sexuality may intersect to influence within-household activity allocation (cf. Rapino and Cooke 2011, who use same-sex partnered households as a counterfactual). A deeper understanding of how gender and household arrangements—including same-sex partnerships, opposite-sex partnerships, roommates, and other arrangements—influence activity and travel patterns may shed light on the mechanisms behind the gendered differences in travel. For instance, we expect that our study will suggest whether it is in fact sex in a broad societal context that drives the differences, or rather sex in a very specific context: that of the opposite-sex partnered household—the explicit or implicit subject of most prior studies. We thus propose to examine activity participation by sex and household type using two datasets. The first will be the confidential, geo-coded version 2009 NHTS, which will allow us to examine the connection between gender, household structure, and outside-the-home activity participation, as well as the availability and utilization of transportation resources of individuals in the household. The strength of this dataset is its ability to provide valuable information on specific transportation variables such as details on the vehicles owned by a household. However, a significant weakness of this dataset is the lack of within-household activity participation information, such as household chores and in-home childcare activities. In order to understand how gender, sexuality, and household

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|   | <p>structure influence both within-household and out-of-the-home activity patterns, we will also attempt to employ the American Time Use Survey, a detailed activity survey conducted in conjunction with the Bureau of Labor Statistics' Current Population Survey. From this research, we expect to produce two academic papers—first, one that focuses on automobile usage and activity participation in various household types, with a particular emphasis on the differences between same-sex partnered and opposite-sex partnered women. In the second paper, we will examine the trade-offs between within-household and out-of-the-home activities, again with a special focus on the differences between women in same-sex and opposite-sex partnered households. Finally, we will produce a report for the University of California Transportation Center summarizing our findings from these two analyses.</p> |
| <p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p> | <p>N/A: Project in progress</p>  |
| <p>Impacts/Benefits of Implementation (actual, not anticipated)</p>                                       | <p>N/A: Project in progress</p>  |
| <p>Web Links</p> <ul style="list-style-type: none"> <li>• Reports</li> <li>• Project Website</li> </ul>   | <p>N/A: Project in progress</p>  |

| <b>UTC Project Information</b>        |  |
|---------------------------------------|--|
| Project Title                         | Exploration and Implications of Multimodal Street Performance Metrics: What's a Passing Grade?   |
| University                            | UC Los Angeles   |
| Principal Investigator                | Robin Liggett & Rui Wang   |
| PI Contact Information                | <a href="mailto:rliggett@ucla.edu">rliggett@ucla.edu</a>   |
| Funding Agencies                      | DOT  |
| Agency ID or Contract Number          | 7870   |
| Project Cost                          | \$68,257.00  |
| Start and End Dates                   | FY2012-2013  |
| Project Duration                      | N/A: Project in progress   |
| Brief Description of Research Project | <p>This project aims to analyze new multimodal street performance metrics for transportation projects. Scholars and practitioners have developed these new performance metrics in recent years in an attempt to replace traditional automobile-based level of service (LOS) indicators. Many scholars and practitioners feel traditional LOS overemphasizes the free flow of automobile traffic while neglecting other users of the transportation system. While practitioners and advocates have shown enthusiasm for these new metrics, policy-makers have found it difficult to transition from well-understood and standardized automobile-based LOS metrics to any one of the new multimodal metrics. Similarly, scholars have paid a great deal of attention to the development of these new metrics, but have not documented how these metrics compare to one another. This comparison is necessary, as each of the metrics embodies a number of assumptions about the performance of the transportation network for non-auto users such as pedestrians and cyclists. This project will aid policy-makers by explicating these assumptions, providing a comparability analysis of the various metrics and relating the results to policy implications. Further, this project will enrich our understanding of the ways in which the needs of government regulation results in a reduction of complex transportation systems to simple</p> |

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| Describe Implementation of Research Outcomes (or why not implemented)<br><br>Place Any Photos Here | N/A: Project in progress |
| Impacts/Benefits of Implementation (actual, not anticipated)                                       | N/A: Project in progress |
| Web Links <ul style="list-style-type: none"> <li>• Reports</li> <li>• Project Website</li> </ul>   | N/A: Project in progress |

| <b>UTC Project Information</b>        |  |
|---------------------------------------|--|
| Project Title                         | A Spatial Analysis of Housing and Transportation Affordability in Los Angeles County   |
| University                            | UC Los Angeles   |
| Principal Investigator                | Evelyn Blumenberg  |
| PI Contact Information                | <a href="mailto:eblumenb@ucla.edu">eblumenb@ucla.edu</a>   |
| Funding Agencies                      | DOT  |
| Agency ID or Contract Number          | 7870   |
| Project Cost                          | \$30,014.00  |
| Start and End Dates                   | FY2012-2013  |
| Project Duration                      | N/A: Project in progress   |
| Brief Description of Research Project | <p>Increases in fuel prices, combined with the deep downturn in the economy, have raised concerns about the burdens of transportation costs on low-income families. We propose to investigate this issue, focusing specifically on neighborhood variation in the percentage of household incomes spent on housing and transportation. We hypothesize that the phrase "drive 'til you qualify" (for a mortgage) has some truth; poor and moderate- income households living in suburban areas—particularly inner-ring suburbs—will pay less for housing, but more for transportation than households living in wealthy suburban neighborhoods or in central-city neighborhoods well served by public transit. We will test this hypothesis using individual data on vehicle miles traveled, vehicle type and fuel efficiency, and housing costs. Specifically, the proposed project will combine property-level housing data, vehicle-specific fuel use information, and block-group demographic data for households in Los Angeles County. We, first, will examine spatial variation in housing-transport costs relative to income. We then will analyze how neighborhood affordability has evolved since 2000, a period in which gas prices rose significantly. Finally, we will assess whether there is a relationship between neighborhood income levels and changes in vehicle miles traveled and the fuel economy of neighborhood vehicles.</p> |

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| <p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p> | <p>N/A: Project in progress</p> <p>Thus far, we have (a) geocoded the DMV data and matched the data to parcels and census tracts and (b) assembled Census data. We are now in the process of attaching vehicle information to these data. The data assembly for this project has been time consuming, as we expected. Once all of the data have been assembled, we will conduct our analysis.</p> |
| <p>Impacts/Benefits of Implementation (actual, not anticipated)</p>                                       | <p>N/A: Project in progress</p>   |
| <p>Web Links</p> <ul style="list-style-type: none"> <li>• Reports</li> <li>• Project Website</li> </ul>   | <p>N/A: Project in progress</p>   |

| <b>UTC Project Information</b>  |  |
|---|--|
| Project Title   | Calibration of Traffic Micro-simulation Models for Microscopic Vehicle Emission Modeling   |
| University  | UC Riverside   |
| Principal Investigator  | Kanok Boriboonsomsin   |
| PI Contact Information  | kanok.boriboonsomsin@ucr.edu   |
| Funding Agencies  | DOT  |
| Agency ID or Contract Number  |  |
| Project Cost  | \$79,861   |
| Start and End Dates   |  |
| Project Duration  | N/A: Project in progress   |
| Brief Description of Research Project                                 | To examine if the current state of the practice for calibrating traffic microsimulation models is sufficient to make the simulated vehicle trajectories represent those observed in the real-world at the micro scale, and 2) to develop supplemental calibration criteria and procedures specifically for the purpose of modeling emissions at the micro scale. |
| Describe Implementation of Research Outcomes (or why not implemented) | N/A: Project in progress   |
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| <p>Impacts/Benefits of Implementation (actual, not anticipated)</p>                                  | <p>Traffic microsimulation models have been increasingly used in the regulatory mandated project-level emission analyses. However, the current model calibration practice is found to be insufficient for ensuring accurate emission estimates. The result of this project will provide the transportation and air quality planners/engineers with supplemental calibration criteria and procedures specifically for the purpose of modeling emissions at the micro scale, which would help them better perform the project-level emission analyses.</p> |
| <p>Web Links</p> <ul style="list-style-type: none"><li>• Reports</li><li>• Project Website</li></ul> | <p>N/A: Project in progress</p>  |

| <b>UTC Project Information</b>  |  |
|---|--|
| Project Title   | ECO-Driving Technology and Behavior Research for Heavy-Duty Trucks   |
| University  | UC Riverside   |
| Principal Investigator  | Matthew Barth and Kanok Boriboonsomsin   |
| PI Contact Information  | matthew.barth@ucr.edu,<br>kanok.boriboonsomsin@ucr.edu   |
| Funding Agencies  | DOT  |
| Agency ID or Contract Number  |  |
| Project Cost  | \$145,413  |
| Start and End Dates   |  |
| Project Duration  | N/A: Project in progress   |
| Brief Description of Research Project                                 | To develop and evaluate heavy-duty truck eco-driving technology and to study the behavioral impact eco-driving may have on truck drivers. This truck-based eco-driving research builds upon UC Riverside's current research in eco-driving technology for light duty vehicles. This proposed work also pulls in the heavy-duty truck research being carried out by researchers at Cal State San Bernardino and makes use of their recently acquired unique driving simulators. By combining these two neighboring research organizations (i.e., UCR and CSUSB), this valuable eco-driving study will provide important insight on how better fuel economy and lower CO2 emissions can be achieved in the goods movement arena. |
| Describe Implementation of Research Outcomes (or why not implemented) | N/A: Project in progress   |
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| Impacts/Benefits of Implementation<br>(actual, not anticipated)                               | Truck –based eco-driving technology and algorithms are being developed. If successful, then this technology may save 5% to 10% on fuel consumed, having a major impact for goods movement. |
| Web Links <ul style="list-style-type: none"><li>• Reports</li><li>• Project Website</li></ul> | N/A: Project in progress   |

| <b>UTC Project Information</b>        |   |
|---------------------------------------|---|
| Project Title                         | Air Quality in Transit Oriented Developments  |
| University                            | UC Riverside, UC Los Angeles  |
| Principal Investigator                | Akula Venkatram   |
| PI Contact Information                | <a href="mailto:venky@engr.ucr.edu">venky@engr.ucr.edu</a>  |
| Funding Agencies                      | CalTrans  |
| Agency ID or Contract Number          | 8084  |
| Project Cost                          | \$130,598.00  |
| Start and End Dates                   | FY2012-2013   |
| Project Duration                      | N/A: Project in progress  |
| Brief Description of Research Project | <p>The objectives of the research program are to 1) develop a semi-empirical model to describe the impacts of building morphology and the associated micrometeorology on air quality within transit oriented developments (TOD), and 2) use the model to suggest TOD designs that minimize the exposure of TOD residents to emissions from cars and buses traveling along transit corridors. Our current understanding of the effects of urban structures on the air quality impact of these emissions is poor. We will improve this understanding by conducting field studies in selected TODs under a variety of meteorological conditions to develop a data base that will be used to develop the semi-empirical model. This research, the results of which can be used to help protect public health through better design of transit corridors, fits well into UCTC's research topics: livability and environmental sustainability. The research will be conducted by a multidisciplinary team with the expertise required to achieve the objectives. Akula Venkatram (UCR), PI, will lead activities related to modeling dispersion in urban canopies, Suzanne Paulson (UCLA) will be responsible for air quality measurements, and J.R. DeShazo (UCLA) will provide expertise in urban planning and policy analysis.</p> |
| Describe                              | N/A: Project in progress  |

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| Implementation of Research Outcomes (or why not implemented)<br><br>Place Any Photos Here     |                          |
| Impacts/Benefits of Implementation (actual, not anticipated)                                  | N/A: Project in progress |
| Web Links <ul style="list-style-type: none"><li>• Reports</li><li>• Project Website</li></ul> | N/A: Project in progress |

| <b>UTC Project Information</b>  |  |
|---|--|
| Project Title   | Transit route design for smaller cities: working towards sustainability  |
| University  | UC Santa Barbara   |
| Principal Investigator  | Richard Church & Timothy Niblett   |
| PI Contact Information  | church@geog.ucsb.edu   |
| Funding Agencies  | DOT  |
| Agency ID or Contract Number  | 7872   |
| Project Cost  | \$40,000.00  |
| Start and End Dates   | FY2012-2013  |
| Project Duration  | N/A: Project in progress   |
| Brief Description of Research Project                                 | <p>In this research project Dr. Richard Church and Tim Niblett will develop: 1) a revised version of the Lei and Church (2010) transit access model, along with a documented application, and 2) a model capable of generating optimal routes with one or multiple loops. Existing optimal route models do not allow embedded loops. This new model will be tested on a small representative network data set. We also plan to determine the role in which loop routes can play in optimal route design. The fact that small cities rely on routes with loops to provide transit access and coverage suggests that these structures can increase coverage without significantly adding to overall transit route length. The true value of routes with loops cannot be assessed without the development of a model which is capable of generating an optimal route with an embedded loop (e.g. barbell shaped route, figure eight shaped route, lollypop shaped route, etc.) Without this new model, comparing optimal routes with loops and optimal routes without loops cannot be made. In the long run, this model can help to improve route design in smaller cities and towns.</p> |
| Describe Implementation of Research Outcomes (or why not implemented) | N/A: Project in progress   |

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|---|--------------------------|
| Place Any Photos Here   |                          |
| Impacts/Benefits of Implementation<br>(actual, not anticipated)                               | N/A: Project in progress |
| Web Links <ul style="list-style-type: none"><li>• Reports</li><li>• Project Website</li></ul> | N/A: Project in progress |

| <b>UTC Project Information</b>        |  |
|---------------------------------------|--|
| Project Title                         | Business Establishment Spatial Evolution Microsimulation (BESEM)   |
| University                            | UC Santa Barbara   |
| Principal Investigator                | Kostas Goulias & Srinath Ravulaparthu  |
| PI Contact Information                | <a href="mailto:goulias@geog.ucsb.edu">goulias@geog.ucsb.edu</a>   |
| Funding Agencies                      | DOT  |
| Agency ID or Contract Number          | 7872   |
| Project Cost                          | \$32,000.00  |
| Start and End Dates                   | FY2012-2013  |
| Project Duration                      | 4/2/2012 to 9/30/2013  |
| Brief Description of Research Project | <p>In this research project Dr. Kostas Goulias and Srinath Ravulaparthu will develop a model system and define initial testing of a business establishment spatial evolution microsimulator (BESEM). The main objective of this method is to create a self- standing software that is able to replicate the change in location of each business establishment in California as a function of its relationship with other business establishments and the transportation infrastructure connecting all businesses. This is a much needed method to: a) show the spatial correlation between business location (and implicitly jobs) and infrastructure by each business type at a microlevel; and b) compute activity opportunity based accessibility indicators that capture observed changes due to businesses moving into the state, moving out of thestate, and relocating from one region to another. Schemata for each business type (medical, retail, legal) will be first developed and tested with real world data using point process statistical models. These models will then be used in a small scale simulation as proof of concept to show their spatial and temporal relationship with transportation infrastructure. The tasks include data assembly and assessment of quality, testing of spatial statistics models, creation of the simulator framework, and testing.</p> |

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| <p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p> | <p>Although this project has no applications developed yet, it provided a feasibility test for the development of simulators using this type of data. Patterns were studied using a small portion of the data to test the feasibility of the ideas that resulted in a research report. We also identified a set of transition models for business relocation that need further development and they are created by Ravulaparthi in his dissertation. The accessibility work although interesting was left for another project that will also analyze observed travel patterns. Added directions of this work will be followed by a Fall 2013 new Ph.D. student.</p> |
| <p>Impacts/Benefits of Implementation (actual, not anticipated)</p>                                       | <p>N/A: Project in progress</p> <p>Feasibility of the initial methods designed for this project. Better understanding of the business location decisions complexity. Identified the need to study the network supporting business locations and new research opportunities in this direction. Gained understanding about location and relocation of business establishments.</p>  |
| <p>Web Links</p> <ul style="list-style-type: none"> <li>• Reports</li> <li>• Project Website</li> </ul>   | <p>EXPLORING THE SPATIAL AND TEMPORAL PATTERNS OF BUSINESS CONCENTRATION AND DISPERSION: A CASE-STUDY ANALYSIS FOR COUNTY OF SANTA BARBARA.</p> <p>Ravulaparthi, S., K.G. Goulias, S.S. Sweeney, and P. Kyriakidis</p>  |