

ITS-Davis e-news, Issue 42 (October 2010)

ITS-Davis e-news presents information on research, education, and outreach from the UC Davis Institute of Transportation Studies and affiliated campus departments that host transportation-related programs. For previous issues, visit the [e-news archives](#).

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Research Update

Dan Sperling Receives 16th Annual Heinz Award

ITS-Davis Director Dan Sperling last month learned he is one of ten national environmental innovators to receive a prestigious [Heinz Award](#). Sperling was honored for his significant contributions to revolutionary transportation and energy research.

The Heinz Award commends Sperling for his creativity in developing the unique academic model that is the heart of ITS-Davis, an approach that merges research, policy studies, and entrepreneurship in pursuit of clean, equitable transportation options. The award also recognizes Sperling as instrumental in passage of California's groundbreaking Low Carbon Fuel Standard.



Dan Sperling

"To have a member of the UC Davis faculty receive this year's Heinz Award recognizes the university's embrace of global sustainability and green technology," said UC Davis Chancellor Linda Katehi. "I congratulate Dr. Sperling and all in the university community who cultivate a culture of innovation, effectiveness, and stewardship."

Researchers Contribute to State's Smart Growth Policy-Setting



California is adopting revolutionary policies to reduce greenhouse gas (GHG) emissions by encouraging “smart growth” so that people can live close to where they work and play and reduce vehicle use. ITS-Davis researchers from the Urban Land Use and Transportation Center (ULTRANS) are involved in a multi-year project that is guiding state and local policy makers as they implement a new state law that sets these new practices in motion, ultimately improving transportation choices.

Last month, the California Air Resources Board adopted targets for reducing GHG emissions by reducing sprawl and vehicle use. These GHG targets are applied to each of the state’s 18 metropolitan planning areas. The decision capped a two-year, bottom-up process in which cities, counties, the public, and ARB worked together to define the targets for each region. How the regions meet their targets will depend on the policies they develop.

ULTRANS researchers played a key role in the design and adoption of the law and are working closely with many of the largest metropolitan planning agencies on a suite of tools to help them design and implement their local policies. UC Davis researcher Deborah Salon, Professor Dan Sperling and others proposed how to design the targets in a paper presented in early 2007 to key decision makers, and later published as [“City Carbon Budgets: Aligning Incentives for Climate-Friendly Communities.”](#)

Susan Handy, UC Davis Sustainable Transportation Center director, contributed critical data to support ARB’s target-setting process. Handy and Marlon G. Boarnet of UC Irvine, with assistance from UC Davis post-doc Gil Tal and UC Irvine graduate student Steven Spears, prepared a [series of policy briefs](#) that summarize what is known about the effectiveness of strategies designed to reduce vehicle miles traveled. Topics include road pricing, parking pricing, access to transit, residential density, regional accessibility, connectivity, bicycle and pedestrian strategies, and transit services. Each brief summarizes selected research literature and describes the range of effects of each strategy shown in the literature.



In some cases, the findings in the literature suggest a narrow range of effects, giving decision-makers confidence that a chosen policy will have the expected effect. In other cases, the range of effects is very wide, demonstrating lack of certainty about some strategies. And in some cases there is not enough evidence to pick a range at all. For example, the parking pricing brief notes that while there is a strong correlation between parking prices and a reduction in demand for parking spaces, there is relatively little available evidence of the direct impact of parking pricing on vehicle miles traveled.

“The available data still stops short of providing the information policy makers need,” Handy laments. Despite the shortcomings of data, the work serves a critical clearinghouse function that state and local planners didn’t have before.

“The study of travel behavior is interesting, but to feed that knowledge into the policy process—that’s what earns our keep. It’s incredibly satisfying to contribute to development of policies that will help us reach our climate goals.”

Handy and Salon are already developing the next generation of evidence. They are collecting on-the-ground data through “before” and “after” surveys around projects in Davis, including a new Target store, a planned road diet through downtown, and a new residential neighborhood adjacent to campus. They see similar evaluation opportunities occurring throughout the state and plan to engage local governments as active participants in these studies.

The stakes are enormous, Handy adds. “If we want to do good planning it needs to be based on realistic analysis. It’s easy to make assumptions and guesses about how much difference policies can make. But if we make wrong guesses we can go in the wrong direction or end up investing in policies that won’t help.” To that end, the ULTRANS team provides a needed reality check.

ITS-Davis Launches Research Findings

ITS-Davis has launched a new communications program, "Research Findings" to highlight interesting and important results from our diverse research program. ITS-Davis will occasionally send out single-topic e-mails that highlight key results and provide links to the published research report, the researcher's web page, and other relevant information.

Recent Research Findings features include the following:

[Feebates: A Complementary Strategy for Reducing GHG from Vehicles](#)

[Travel Behavior: Commuter Response to the Fix I-5 Project](#)

[Road Ecology: Measuring the Wildlife Death Toll along California Roads](#)

UC Researchers Cited in *Science Direct* Top 25

Four papers authored by ITS-Davis researchers made the Elsevier Publications *Science Direct* "Top 25 Hottest Articles" list for April to June, 2010.

Jonn Axsen, Kenneth S. Kurani, and Andrew F. Burke (2010) "[Are Batteries Ready for Plug-in Hybrid Buyers?](#)" *Transport Policy*, 17 (3), May 2010, 173-182.

Jonn Axsen and Kenneth S. Kurani (2010) "[Anticipating Plug-in Hybrid Vehicle Energy Impacts in California: Constructing Consumer-Informed Recharge Profiles.](#)" *Transportation Research Part D: Transport and Environment*, 15 (4), 1 June 2010, 212-219.

Mark A. Delucchi and Timothy E. Lipman (2001) "[An Analysis of the Retail and Lifecycle Cost of Battery-Powered Electric Vehicles.](#)" *Transportation Research Part D: Transport and Environment*, 6 (6), 1 November 2001, 371-404.

Timothy E. Lipman and Mark A. Delucchi (2006) "[A Retail and Lifecycle Cost Analysis of Hybrid Electric Vehicles.](#)" *Transportation Research Part D: Transport and Environment*, 11 (2), 1 March 2006, 115-132.

UC Research: Warming Climate Means Harsher Smog Season for California



Rising temperatures from climate change will increase ozone levels in California's major air basins. That's the finding of a [UC Davis report released recently by the California Air Resources Board](#). UC Davis Civil and Environmental Engineering Professor Michael J. Kleeman was lead author.

The study provides evidence of what is becoming known as the climate penalty, where rising temperatures increase ground level ozone and airborne health-damaging particles, despite the reductions achieved by programs targeting smog-forming emissions from cars, trucks and industrial sources.

"Our study reveals that climate change and regional air pollution are intertwined problems," said Kleeman in an ARB news release. "We must consider climate change and air pollution together as we plan for the future."

Contributing authors were Shu-Hua Chen, Department of Land, Air, and Water Resources, UC Davis and Robert A. Harley, Department of Civil and Environmental Engineering, UC Berkeley.

The study found that California could experience as many as six to 30 more days with ozone concentrations that exceed federal clean-air standards, depending on the extent of increased temperatures and assuming criteria-pollutant emissions in California remain at 1990-2004 levels.

The researchers predicted the effects of climate change on California regions by merging the results from large-scale global

models with detailed models for the South Coast and San Joaquin Valley. These narrow-focused models utilize high-resolution information about the geography, meteorology and emissions of these areas.

Sustainable Transportation Center Update

California Connectivity Forum 2010

The Sustainable Transportation Center and the Road Ecology Center at UC Davis are teaming up to present [California Connectivity Forum 2010](#) on December 1.

California Connectivity Forum 2010 expands on the successful 2008 Forum, which brought together scientists and practitioners to discuss wildlife movement and landscape connectivity, and to incorporate humans into the discussion of ecosystem connectivity. Topics will include: Wildlife movement, habitat connectivity, multi-modal transportation within communities, regional community connectivity, social and ecological network analysis, integrated analysis, and planning for connectivity.

Research Webinars Return

The STC and Caltrans Division of Research and Innovation are again offering [New Research Webinars for Transportation Professionals](#) this fall. Webinars are free and can be viewed in-person or online. Interactive Q+A sessions take questions from both the in-person and online audiences.

The season concludes in November with “Equity Considerations in Transportation” featuring:

- “Equity Analysis of Land Use and Transport Plans Using an Integrated Spatial Model” by Caroline Rodier
- “Travel Behavior among Latino Immigrants: The Role of Ethnic Neighborhoods and Ethnic Employment” by Gary Painter

The October webinar topic was “Encouraging Sustainable Travel, Part II” and the September webinar topic was “Efficient Management of Road Construction & Operations.” [Recordings of past webinars are available on the STC website.](#)

STC Sponsors Undergraduate-to-Graduate Symposium

The Undergraduate-to-Graduate Symposium offers a time for the STC summer undergraduate fellows to cement their understandings and connect with other transportation-interested undergraduates. Last month’s symposium started with presentations by the fellows on their research projects. Just like researchers at a conference, the students took questions from the audience, which included faculty, STC-funded graduate student fellows, and other undergraduates. Then, to help the students better understand and imagine themselves doing transportation research, three STC graduate students presented their research and insight into their career paths. Juhong Yuan, an STC program fellow and Ph.D. candidate in the Transportation Technology and Policy program, presented her research project on food miles in honey production.



Juhong Yuan takes questions from the audience.

New Initiatives

PH&EV Center Develops Strategic Plan for Plug-in Electric Vehicles in California



The UC Davis Plug-in Hybrid & Electric Vehicle Research Center is facilitating a statewide collaborative effort to create a strategic plan to ensure success of the early market and large-scale deployment of plug-in electric vehicles.

The [California Plug-in Electric Vehicle Collaborative](#) is a diverse group of

committed stakeholders including elected and state agency officials, academic experts, automakers, utilities, infrastructure providers, and environmental and non-governmental organizations. They came together to develop a thoughtful strategy for California to move forward with PEVs, said PH&EV Center Director Tom Turrentine.

“This is an effort to build on current progress, identify remaining challenges and opportunities, and begin developing solutions,” said Turrentine. “We also expect to develop suggestions for additional research to understand consumer use and behaviors to inform future policy and funding decisions.”

A team of PH&EV Center researchers is developing the plan for release this winter and facilitating a series of webinars this fall for important stakeholder groups such as public and commercial fleets and small governments. Approximately 30 stakeholders are participating in Collaborative meetings and providing input to UC Davis on the strategic plan.

Education Highlights

Profile: Bryan Jones, B.S., CEE 1999



On any given day, you might find Fresno City Traffic Engineer Bryan Jones approving traffic control permits, reviewing environmental impact reports and traffic impact studies, overseeing the intelligent transportation system or addressing street design and traffic signal issues. You might also find him talking to a reporter about the city’s new “road diet” that his department is instituting, through a resurfacing and repurposing process, to calm traffic, install bike lanes, and create safer roadways for all users in California’s fifth-largest city.

Jones loves to combine his vision as a professional transportation planner with

implementation as a traffic engineer to improve mobility and safety. The UC Davis 1999 Civil and Environmental Engineering graduate recently elevated his forward-thinking profile with the completion of a comprehensive and progressive [Bicycle Master Plan](#) for the City of Fresno. The BMP was designed, he says, to bring “a lot of innovation to ways we can navigate the city other than with a single-occupant vehicle.” It contains what he says are the necessary components for prioritizing projects and building a user-friendly, effective bicycle transportation network.



“Having lived in Davis, I discovered how livable a community could be with bikes. We want to make Fresno more livable and sustainable environmentally, economically and from a public health standpoint,” he explains. Fresno has air quality, public health, and economic challenges as a result of its expansive roadway and freeway system built for the automobile. Making Fresno’s transportation system more conducive to bicycle use is part of the solution, he says.

Jones caught the transportation bug as an undergrad at UC Davis where he took classes from ITS-Davis professors Pat Mokhtarian, Dan Sperling, Michael Zhang, and Deb Niemeier. While at UC Davis he was a research intern on a groundbreaking carsharing project, directed by then-graduate student Susan Shaheen under the Institute’s New Mobility Center. Dr. Shaheen now holds joint research positions with ITS-Davis and UC Berkeley. Jones calls Shaheen an “important mentor” and says his ITS-Davis experience inspired him to “enter the transportation field and make a difference, and not accept status quo.” He posits: “Maybe the American dream of a single-family home with two cars in the garage is not ideal.”

In Fresno, the BMP and accompanying [road diets](#) are presenting opportunities for ongoing citizen education. “We are changing the perception of many generations that the roadways can be used and shared by bike riders as well as motorists.” Ultimately, he says, it makes Fresno’s roads safer for motorists, more inclusive and safer for bike riders, and safer for pedestrians.

By stepping up and taking action, he adds, the city can be a leading example for the region’s many smaller jurisdictions. “They may not have resources to do their own bicycle plans and campaigns, but they can borrow ideas and concepts from ours,” and in doing so, improve the air quality and livability in their communities and throughout the Central Valley.

Friends of ITS-Davis Outstanding Dissertation and Thesis Awards

The joint winners of the 2009 *Friends of ITS-Davis* Outstanding Ph.D. Dissertation Award are Changzheng Liu and Ryan McCarthy. Liu's dissertation is "[A Stochastic Programming Approach for Transportation Network Protection](#)." McCarthy's dissertation is "[Assessing Vehicle Electricity Demand Impacts on California Electricity Supply](#)."

In evaluating this year's submissions, the awards committee commented: "The two winning dissertations have selected problems of outstanding importance, and applied rigorous and sophisticated technical approaches to addressing those problems."

Rachel Carpenter received the 2009 Friends of ITS-Davis Outstanding Master's Thesis Award for "[Sacramento's Fix I-5 Project: Impact on Bus Transit Ridership](#)." Carpenter's nomination letter noted: "The combination of techniques she applied is quite sophisticated for even a transportation Ph.D. student (let alone an M.S. student ...)."

ITS-Davis Congratulates Recent Grads

As the new academic year begins, the Institute congratulates an impressive group of graduates who have completed studies over the last 18 months. Degrees were given in Transportation Technology and Policy (TTP), Mechanical and Aerospace Engineering (MAE), Civil and Environmental Engineering (CEE), Agricultural and Resource Economics (ARE), Geography and Ecology.

June 2010

Jonn Axsen, Ph.D., TTP

Adviser: Ken Kurani

Dissertation: "Interpersonal Influence within Car Buyers' Social Networks: Observing Consumer Assessment of Plug-in Hybrid Electric Vehicles (PHEVs) and the Spread of Pro-Societal Values"

Current Position: Post-doctoral researcher at UC Davis

Amine Mahmassani, M.S., TTP

Adviser: David Bunch

Thesis: "An Equity Analysis of Proposed Feebate Policies for California Households"

Wei Tang, Ph.D., TTP

Adviser: Pat Mokhtarian

Dissertation: "An Investigation of E-shopping for Clothing and Books, with a Focus on Taste" Heterogeneity: Evidence from Northern California

Alexandra Timoshek, M.S., TTP

Adviser: Deb Niemeier

Thesis: "Mobile Source Air Toxics: Project Level Emissions Analysis Framework and Emissions Sensitivity Testing"

January 2010

Bradley Brown, M.S., MAE

Adviser: Paul Erickson

Exam

December 2009

Rachel Carpenter, M.S., CEE

Adviser: Michael Zhang

Thesis: "Sacramento's Fix I-5 Project: Impact on Bus Transit Ridership"

Current Position: San Francisco Municipal Transportation Agency

Brenda Chang, M.S., TTP

Adviser: Alissa Kendall

Thesis: "Initial Greenhouse Gas Emissions from the Construction of the California High Speed Rail Infrastructure: A Preliminary Estimate"

Current Position: International Council on Clean Transportation

Pengcheng Fu, Ph.D., CEE

Adviser: John Harvey

Dissertation: "Micromechanics for Foamed Asphalt Stabilized Materials"

Current Position: Lawrence Livermore National Laboratory

David Heres Del Valle, Ph.D., ARE

Adviser: Richard Howitt

Dissertation: "Essays on the Comparison of Climate Change Policies: Land Use Regulations, Taxes, and Tradable Permits"

Ryan McCarthy, Ph.D., CEE

Adviser: Dan Sperling

Dissertation: "Assessing Vehicle Electricity Demand Impacts on California Electricity Supply"

Current Position: California Science and Technology Policy Fellow, California Legislature

September 2009

Karen Beardsley, Ph.D., Geography

Advisor: James Wilen

Dissertation: "An Impact Analysis of Future Human Settlements on Biological Resources and Greenhouse Gas Emissions in California, and on Wildlife Corridors in a Maasai Group Ranch in Kenya"

Current Position: Project Manager, UC Davis Environmental Science and Policy

Giovanni Circella, M.S., ARE

Adviser: Pat Mokhtarian

Exam

Current Position: Post-Doctoral Researcher at UC Davis

Jonathan Hughes, Ph.D., TTP

Adviser: Chris Knittel

Dissertation: "Essays on Environmental Economics and Empirical Industrial Organization in Transportation Markets: Gasoline Demand; Low Carbon Fuel Standards; and Market Power in the Rail Transport of Ethanol"

Current Position: Assistant Professor, University of Colorado, Boulder

Changzheng Liu, Ph.D., CEE

Adviser: Yueyue Fan

Dissertation: "A Stochastic Programming Approach for Transportation Network Protection"

Current Position: Oak Ridge National Laboratory

Douglas Saucedo, M.S., MAE

Adviser: Andrew Frank

Exam

Current Position: Pursuing Ph.D. at UC Davis

Wei Shen, Ph.D., CEE

Adviser: Michael Zhang

Dissertation: "System-Optimal Dynamic Traffic Assignment: A Graph-Theoretic Approach and Its Engineering Application"

Current Position: Post-doctoral Researcher, IBM Watson Research Center

Terrance Williams, M.S., MAE

Adviser: Andrew Frank

Thesis: "Control System Development for a Pre-Transmission Parallel Plug-In Hybrid Electric Vehicle Powertrain with a Mechanical Continuously Variable Transmission"

June 2009

Brendan Connors, M.S., MAE

Adviser: Mont Hubbard

Farshidi Faramarz, M.S., CEE

Adviser: John Harvey

Exam

Current Position: Pursuing Ph.D. at UC Davis

Adam Henry, Ph.D., TTP

Adviser: Paul Sabatier

Dissertation: "Tying it All Together: Networks and Policy-Oriented Learning in Regional Planning Processes"

Current Position: Assistant Professor, West Virginia University

Bryan Jungers, M.S. CEE

Adviser: Dan Sperling

Thesis: "The Evolution of Sustainable Personal Vehicles"

Laura Poff, M.S., TTP

Adviser: Michael Zhang

Exam

Current Position: Graduate Studies, Vanderbilt University

Dana Rowan, M.S., Ecology

Exam

Current Position: Seeking Ph.D. at UC Davis

Ru Wang, M.S., TTP

Adviser: Deb Niemeier

Exam

Current Position: Seeking Ph.D. at UC Davis

March 2009

Eung Jin Jeon, Ph.D., CEE

Adviser: John Harvey

Dissertation: "Comprehensive Performance Evaluation of In-Place Recycled Hot Mix Asphalt as Unbound Granular Material"

Current Position: URS Corporation

Matthew Seitzler, M.S., MAE

Adviser: Paul Erickson

Thesis: "The Electrical and Mechanical Performance Evaluation of a Roof-Mounted, One Kilowatt Wind Turbine"

Current Position: Consultant, Spectrum Renewable Energy Engineering

Yan Xing, M.S., TTP

Adviser: Susan Handy

Welcoming New Students

Faculty, staff, and continuing graduate students gathered to welcome new students and kick off the academic year at the annual ITS-Davis fall barbeque.



ITS-Davis Highlights

People: Awards, Accolades, and Activities

Professor Nicole Woolsey Biggart of the Graduate School of Management assumed leadership of the UC Davis Energy Efficiency Center in July. ITS-Davis Director Dan Sperling had been serving as acting director since 2008. Biggart is also the first recipient of the Chevron Chair in Energy Efficiency.

Pat Mokhtarian is one of 20 "Thinkers" who share their view on how broadband connectivity and mobility are changing the world in a new online campaign launched by Ericsson. [Mokhtarian describes her research](#) that links increases in telecom connectivity to increases in travel demand, not the opposite as most would intuitively expect.



Nicole Biggart and Dan Sperling

Author Lecture: Political Insight on Climate Action

ITS-Davis co-hosted a campus visit by Eric Pooley, author of [The Climate War: True Believers, Power Brokers, and the Fight to Save the Earth](#) in September. Pooley delivered a public lecture on the issues and players in the battle over climate action in the U.S., and signed copies of his book. "We all benefit from Eric Pooley's insight into the behind-the-scenes politics that shape our country's response to climate change," noted ITS-Davis Director Dan Sperling. Other campus hosts were the UC Davis Energy Efficiency Center, Sustainable Transportation Center, Energy Institute, and John Muir Institute of the Environment.



Photo by Michael O'Neill

Coming Event: Governor's Global Climate Summit 3 at UC Davis

Governor Arnold Schwarzenegger will host the [Governors' Global Climate Summit 3](#) at the Mondavi Center on the UC Davis campus November 15 and 16. The third annual summit will bring together leaders from around the world to collaborate on efforts that will further the global fight against climate change, work toward collaborative actions to help reduce emissions, and build green economies.

The governor chose UC Davis as the host location to take advantage of the university's long history of world-class research and development in environmental sustainability and green jobs. The previous summits were held in Los Angeles.

Last fall, more than 1,200 attendees from more than 70 states, provinces and countries attended the summit. As the largest gathering of regional leaders focused on climate solutions, the summit helped to develop cooperative partnerships and promote collaborative actions needed to reduce greenhouse gas emissions, build green economies and fight global climate change.