

ITS-Davis e-news is the electronic newsletter of the UC Davis Institute of Transportation Studies. Written for alumni and friends, *ITS-Davis e-news* reports information from ITS-Davis and affiliated campus departments that host transportation-related programs. For previous issues, see the [e-news archives](#).

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► New Initiatives

CALIFORNIA'S LOW-CARB DIET: UC Researchers to Craft State Plan for Cleaner Fuels



Gov. Arnold Schwarzenegger, flanked by environmentalists, state agency and alternative fuel industry representatives, signs an executive order establishing California's low-carbon fuel standard. ITS-Davis's Dan Sperling is second from right.

Two teams of researchers from UC Davis and UC Berkeley will work together to develop a plan for California to meet the world's first low-carbon fuel standard announced by Gov. Arnold Schwarzenegger in January.

ITS-Davis Director Dan Sperling and UC Berkeley Assistant Professor Alex Farrell are leading the effort. Also on the UC Davis team are professors Joan Ogden and Bryan Jenkins, researchers Mark Delucchi and Marc Melaina, and grad student Jonathan Hughes.

The last few weeks have been filled with meetings, [media interviews](#) and complex policy discussions at the highest level of government, says Sperling. While most of the action has been here in California, there is significant interest in Washington, too, where Sperling and Farrell briefed Congressional staff while attending the annual Transportation Research Board conference in late-January. They also briefed Senate Energy and Natural Resources Committee Chairman Jeff Bingaman (D-New Mexico).

Sperling says he is honored and excited to be working on this innovative and important policy that will be a model for the rest of the world.

"It is great to see the governor grab hold of this. I think it is a profoundly and fundamentally good policy and strategy. It will help the state reduce oil imports, reduce greenhouse gases, and boost investments in alternative fuels. It will steer energy policy and investments for many years and provide a framework that we can build on in the future," Sperling says.

The European Union announced a similar program following California's lead on January 31.

The fuel standard sets a goal to reduce the carbon intensity of California's passenger vehicle fuels by at least 10 percent by the year 2020. This is expected to replace 20 percent of our on-road gasoline consumption with lower-carbon fuels.

As envisioned, the standard will be designed around market competition: oil refiners will have to find ways to reduce their lifecycle greenhouse gas emissions to meet the standard while providers of other fuels, such as ethanol, natural gas, hydrogen or electricity, will have the market incentive to grow.

Exactly how the plan is developed is up to the UC Davis and UC Berkeley researchers. It's all new territory, Sperling acknowledges. "No one understands exactly how to achieve or implement this 10 percent goal."

In the next few months, the UC researchers will tackle many thorny issues. For example, they must decide how to measure and verify upstream emissions related to fuel production, which means everything from farming practices for biofuels to oil refining to electricity generation. They must decide how to account for the greater efficiency of diesel, electric, and fuel cell vehicles. And they must develop a structure to allow trading between refiners and other energy providers. It will be a fully joint effort between UC Berkeley and UC Davis, with the Berkeley team leading the effort to analyze and model the costs and greenhouse gas impacts of the rule, and the Davis team leading the policy design effort.

Once the policy proposal is designed, the California Air Resources Board will incorporate it into its regulatory proceeding as a potential early action measure for reducing greenhouse gas emissions under Assembly Bill 32 enacted last summer.

"This is a great opportunity for us to do some very important and valued work for the state," Sperling adds, noting that the next few months will probably be among the busiest in his life. The UC researchers are committed to completing their analysis for the state by June.



Alex Farrell and Dan Sperling

PLUGGING IN TO FUTURE VEHICLES: State Funded Plug-in Hybrid Research Center at UC Davis

UC Davis will serve as the hub of research on plug-in hybrid vehicles, thanks to a three-year, \$3 million grant from the California Energy Commission (CEC). ITS-Davis will administer the Plug-in Hybrid Electric Vehicle (PHEV) Research Center, Researcher Tom Turrentine will direct the program, and the Center will coordinate with Mechanical Engineering Professor Andy Frank, who is widely known as the father of PHEVs.

"Our mission is to develop and implement a strategic research agenda for the State of California, and to provide technology and policy guidance to the state as it moves forward with this technology," says Turrentine. "The CEC knew that UC Davis was an independent expert they could trust, and I intend to do everything possible to live up to their expectations."

In a press release announcing the contract, CEC Vice Chairman James Boyd said, "The center will serve as a magnet for innovative research by advancing and demonstrating technology which will greatly reduce our dependence on petroleum."

Turrentine says his first priorities are to develop an Advisory Council and a research roadmap to steer the Center's strategic goals and vision. The Advisory Council will be comprised of academics, government and non-governmental organizations, PHEV advocates and industry representatives from the electric utility, fuel provider and automotive manufacturing sectors.

Among the research topics that likely will be woven into a comprehensive program are consumer response, which is Turrentine's expertise, with ITS-Davis Researcher Ken Kurani; vehicle systems analysis, led by Professor Frank and Researcher Andrew Burke; and lifecycle emissions modeling, directed by Researcher Mark Delucchi. Additionally the Center will reach out and engage other stakeholders with interest and expertise in PHEVs.



The Institute's Emily Winston joined PHEV advocate Felix Kramer of CalCars at an alternative fuel vehicle exhibit at the Capitol in January.

Bob Graham, electric transportation program manager at the Electric Power Research Institute (EPRI) and a longtime advocate of PHEV research, says he looks forward to working with the CEC and ITS-Davis in the coming years. "It's good that the state has initiated a program to focus on R&D that hopefully will enable California to provide products and systems support for the electric drive revolution."

Graham, and EPRI colleague Mark Duvall, a UC Davis graduate and former manager of Professor Frank's PHEV lab on campus, will bring to the Center the benefit of several years of PHEV research. The EPRI-led research, funded collaboratively by utilities, government, and industry, will help inform the follow-on research directions of the new PHEV Center at UC Davis.

The Center's funding comes from the CEC Public Interest Energy Research (PIER) program, which supports energy research, development and demonstration projects that improve the quality of life in California.

The future looks promising for PHEVs. Indeed, only weeks after CEC awarded the contract, General Motors showed its PHEV concept, the Chevy Volt at the Detroit Auto Show and Ford introduced a PHEV concept vehicle that uses a fuel cell and batteries.

Research Results

TRACKING THE TRENDS: UC Davis Researchers Give All at TRB

A sizeable crowd of UC Davis researchers has just returned from Washington D.C., re-energized with fresh information and new contacts from the annual Transportation Research Board conference. ITS-Davis and UC Davis transportation researchers presented at more than 40 sessions and meetings during the three-day get-together.

[List of TRB session chairs, meetings and presentations.](#)

Other TRB stories in this issue:

[CLEAN SWEEP: ITS-Davis Celebrates Awards at TRB](#)

[ON THE HILL: UC Davis Researchers Brief Congress, Make the Rounds](#)

LOOKING AHEAD: Upcoming Conferences

Many ITS-Davis students are looking forward to presenting at and attending the annual University of California Transportation Center (UCTC) Conference February 15 – 17. The conference, which rotates among campuses with University Transportation Centers, is scheduled for UCLA this year. Also on the agenda is Energy Crossroads, a national conference hosted at Stanford University March 1 – 2, organized by the student-run Roosevelt Institution.

ARE HYBRIDS MAKING A DIFFERENCE? Yes, Say UC Davis Researchers



ITS-Davis participated in AAA's Greenlight Initiative road rally last year.

UC Davis researchers teamed up with AAA of Northern California last fall to quantify the benefits of hybrids on the road today. Their work, part of the auto club's "[Greenlight initiative](#)," showed that hybrid vehicle benefits to society are relatively small right now, because of their limited market penetration. But the potential oil savings and greenhouse gas reductions are significant.

On average, the study found that each hybrid vehicle reduces lifecycle greenhouse gases by about 30 percent and fuel consumption by about 35 percent compared to a conventional vehicle. Equally as important as the environmental benefit of hybrids is their impact on the marketplace, says ITS-Davis grad student Rusty Heffner, who led the research.

"Think of hybrid cars as a gateway to other vehicle advancements," Heffner says.

"By introducing a new kind of technology into the marketplace, hybrids have encouraged innovation in the market and have sparked interest in other developing technologies like plug-in hybrids, electric cars, and fuel cell vehicles."

AT YOUR FINGERTIPS: ITS-Davis Online Publications Ordering System

Research publications have always been an important product of the Institute's outreach activities. And now, accessing those publications is easier than ever before. The new ITS-Davis online publications database enables online searches by keyword, author, year and title. Each listing includes an abstract of the document; many are fully downloadable. Check out all 1,042 online publications!

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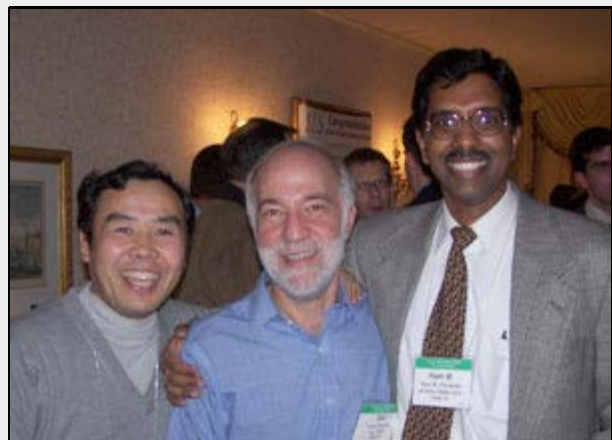
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Education Highlights

CLEAN SWEEP: ITS-Davis Celebrates Awards at TRB



Xinyu Cao flanked by Professor Pat Mokhtarian and former Secretary of Transportation Norman Mineta at TRB



Dan Sperling, center, with grad student Shengyi Gao and alumnus Ram Pendyala, Ph.D. '92

UC Davis faculty and students won praise from across academia during the annual Transportation Research Board (TRB) conference in Washington. In addition to accepting an award from TRB, the winners were recognized and toasted at the annual ITS-Davis reception.

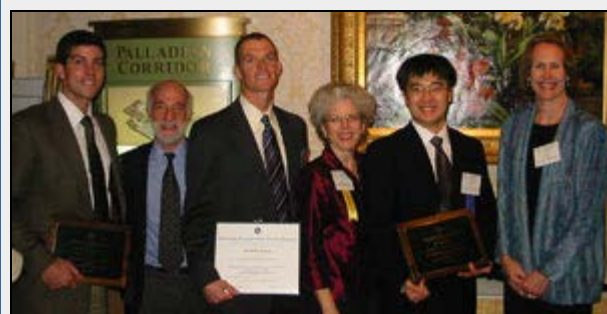
One of the most prestigious annual awards given to graduate students in transportation is the Council of University Transportation Center's C. V. Wootan award for Policy and Planning. ITS-

Davis proudly announces that its students won BOTH awards for 2006. **Xinyu Cao** (best Ph.D. dissertation) and **Jonathan Weinert** (best master's thesis) follow previous UC Davis Wootan winners Sangho Choo (best Ph.D., 2005) and Tim Lipman (best Ph.D., 2000).

"We are thrilled at this double recognition of our extraordinary students," said Professor Pat Mokhtarian, who directs the Institute's education program. "The Wootan policy and planning awards attest to the real-world relevance as well as the academic rigor of their work."

Cao, a student of Mokhtarian's, is an associate research fellow at North Dakota State University. His dissertation was "Causality between the Built Environment and Personal Travel: Evidence from Northern California."

Weinert conducted his thesis, "Near-Term Economic Analysis of Hydrogen Fueling



ITS-Davis award winners and faculty at TRB: Jonathan Weinert, Dan Sperling, Nic Lutsey, Pat Mokhtarian, Xinyu Cao and Susan Handy



Students Gil Tal, Nic Lutsey, Julia Silvis, Belinda Chen and Kristin Lovejoy with ITS-Davis Director of Development Joe Krovoza (in the back)



Joan Ogden and Mike Nicholas

Stations,” under Professor Joan Ogden’s guidance. He is now pursuing a Ph.D., living in Shanghai, China.

Professor Joan Ogden accepted the TRB Barry McNutt Award for the best energy policy paper, “Detailed Analysis of Urban Station Siting for the California Hydrogen Highway Network,” presented at the previous TRB meeting in 2006. Ogden accepted the award on behalf of her student and the paper’s primary author, **Mike Nicholas**, who was unable to attend.

Ph.D. student **Nic Lutsey**, also recognized at the TRB festivities, received the first annual UC Davis University Transportation Center (UTC) Outstanding Student of the Year award. The award is given to a student who excels in research, academic performance, and professionalism and leadership.

Always a big crowd-pleaser, the annual ITS-Davis reception drew several hundred alumni and friends for a few hours of relaxation and merriment. Special thanks to grad students **Julia Silvis** and **Kristin Lovejoy**, and ITS-Davis Events Coordinator **Stacy Mello**, for their work organizing the reception, and grad students **Belinda Chen, Anthony Eggert, Jonathan Hughes, Nathan Parker and Ben Sharpe** for helping out in D.C.

Other TRB stories in this issue:

- [TRACKING THE TRENDS: UC Davis Researchers Give All at TRB](#)
- [ON THE HILL: UC Davis Researchers Brief Congress, Make the Rounds](#)

AND STILL MORE AWARDS: Scholarships Closer to Home

Michael Keteltas, a Transportation Technology and Policy student, won one of three California Transportation Foundation scholarships, offered by Caltrans, in late 2006. Keteltas has been interning at the Caltrans Division of Research and Innovation in Sacramento. He also worked as a student intern at ITS-Davis, and is widely credited for the Institute’s fabulous new online publications ordering database. Way to go, Mike!



Michael Keteltas

Two UC Davis students have been awarded scholarships from the Sacramento Chapter of WTS, the Women’s Transportation Seminar. Transportation Technology and Policy student **Julia Silvis** and **Anna Young**, an undergraduate student advised by Susan Handy, attended an awards ceremony in Sacramento in late January. The mission of WTS is to help women advance and succeed in transportation.

The Institute is pleased to announce three sets of winners of the 2007 *Friends of ITS-Davis* Competitive Research and Project Grants. They are:

Students: **David Vernon and Philipp Pischke**

Faculty Advisor: Paul Erickson

Title: Adaptation of a Proton Exchange Membrane Fuel Cell for Using Liquid Oxygen Carriers

Students: **Kurt Kornbluth and Bryan Jungers**

Faculty Advisors: Paul Erickson and Andy Frank

Title: Load Leveling of Renewable Energy in the Galapagos Islands

Student: **Jonathan Weinert**

Faculty Advisor: Andrew Burke

Title: Electric Bicycle Testing

ENGAGING WITH GOVERNMENT: Scholars Program Connects Academia and Lawmakers

Six UC Davis researchers were among 16 fellows who participated in the prestigious Inter-University Scholars Program on engaging with California government on climate change, sponsored by Stanford University's Woods Institute for the Environment. The program last fall brought together researchers from UC Davis, UC Berkeley and Stanford for three in-depth trainings to improve the understanding, communications and connections between university researchers and Sacramento policy makers who focus on climate change. Representing UC Davis were Steven Cliff, Anthony Eggert, Chris Knittel, Cynthia Lin, Marc Melaina and Chris Yang.

ITS-Davis and Campus Highlights

ON THE HILL: UC Davis Researchers Brief Congress, Make the Rounds



Tom Turrentine, Joan Ogden, Anthony Eggert and Dan Sperling

A team of ITS-Davis researchers, in D.C. for the annual TRB meeting, educated elected officials and Congressional staff on the future of transportation energy. Congressman Mike Thompson hosted the Capitol briefing, "New Breakthroughs in Transportation Technology," which drew more than 70 people. ITS-Davis acknowledges Thompson's longstanding interest in transportation energy and thanks representatives John Doolittle, Dan Lungren and Doris Matsui, who co-signed the invitation letter with Thompson.

ITS-Davis Director Dan Sperling, Professor Joan Ogden, Researcher Tom Turrentine, Hydrogen Pathways Program Manager Anthony Eggert and David Greene, a senior researcher at Oak Ridge National Laboratories, offered critical examinations of future automotive technologies and fuels. They discussed biofuels, hybrid vehicle technologies and hydrogen fuel cell vehicles.

"We discussed the challenges and opportunities of all the promising alternatives that have the potential to simultaneously address the problems of petroleum dependency and greenhouse gas emissions," said Eggert, who worked with Thompson's office to set up the hearing.

[See the presentations.](#)

FREE AND OPEN TO ALL: ITS-Davis Seminars

The weekly seminar series is one of the hottest tickets around for anyone interested in learning more about transportation technology and policy. The free weekly seminars, from 1:30 – 3:00 p.m. Fridays, are held in 1065 Kemper Hall on campus.

[See the Winter Quarter schedule.](#)

ITS-DAVIS PEOPLE: Welcome, New China Center Manager



Yunshi Wang

The ITS-Davis China Center on Energy and Transportation announces the appointment of Yunshi Wang as center manager. Wang will take the lead in developing research funding for the Center and building stronger ties with researchers in China and elsewhere. An energy economist, Wang has worked on energy projects in over ten developing countries, with the World Bank, the United Nations and the Japan International Corporation Agency. Before coming to Davis he worked on Chinese energy issues as a research fellow with Dean Emeritus Lester Thurow, of the Sloan School of Management at MIT. Wang earned a Master's Degree in International Development at American University.

ITS-DAVIS PEOPLE: Ogden Named to ARB Advisory Committee

Professor Joan Ogden has been named to the Economic and Technology Advancement Advisory Committee of the California Air Resources Board. The committee is one of two advisory committees that will help determine how the state's sweeping climate change initiative will be designed and how it will achieve the goals set forth in the California Global Warming Solutions Act of 2006 (Assembly Bill 32).

EXTRA! READ ALL ABOUT IT! ITS-Davis and UC Davis Researchers in the News

Dan Sperling, in multiple national and state papers, on radio and TV in January, on California's low-carbon fuel standard, including the following:

Christian Science Monitor

San Francisco Chronicle

The Sacramento Bee

The Oakland Tribune

Contra Costa Times

National Public Radio

Capital Public Radio, Sacramento

The California Report, KQED and NPR affiliates statewide

KFWB radio, Los Angeles

Dan Sperling, January 20, *San Francisco Chronicle*, on price elasticity of gasoline

UC Davis benefits of hybrids study, January 18, in *The Mercury News*, and January 5, in *The Oakland Tribune*

UC Davis paper on price elasticity of gasoline, January 15, *The New York Times* online

Anthony Eggert, January 3, in *The Sacramento Bee*, in an article on the Inter-University Scholars Program on engaging with California government on climate change

Student Obadiah Bartholomy, January 2, in *The Sacramento Bee*, in a story on biodiesel

Chris Knittel, January 1, in the *San Francisco Chronicle* and Dan Sperling, January 1, on *KCBS-TV*, on price elasticity of gasoline

Debbie Niemeier, December 19, in *The New York Times*, in a feature on women in science and engineering



Dan Sperling's photo appeared five times in this issue of Dateline, the campus newspaper for UC Davis staff