

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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▶ Sustainable Transportation Center Update

SUSTAINABLE TRANSPORTATION CENTER: UTC's New Name

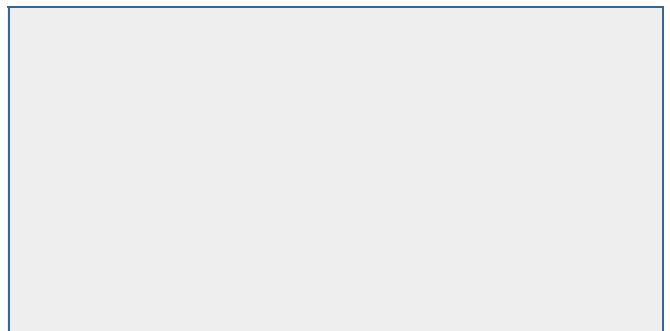
It's official. The University Transportation Center, or UTC, funded through the University Transportation Center program of the U.S. Department of Transportation, with matching funds from Caltrans, will now be called the Sustainable Transportation Center at ITS-Davis. The STC's name and theme emphasize a commitment to better meeting transportation needs while minimizing environmental, societal, and economic costs. The sustainability theme reflects the focus not only of the UTC but of all of ITS-Davis.

Nearly 40 percent of the budget funds fellowships for graduate and undergraduate students in transportation. About one-third of the budget supports small-scale research projects led by ITS-Davis faculty who provide students with research assistantships. Additional funding supports a variety of activities that bring research findings into practice and connect faculty and students to the needs and concerns of public agencies and transportation system stakeholders.

BIKES IN DAVIS: Observing and Preserving the City's Bicycling Culture

For 40 years, Davis has been known as the Bicycling Capital of America. But an increase in car traffic in the last decade has prompted some residents to re-examine the city's commitment to human-powered transportation. Ted Buehler, an ITS-Davis Transportation Technology and Policy student funded in part by the Sustainable Transportation Center, has found a creative way to merge his love of bicycling and concern for community into a master's thesis project that may have a long-term impact on quality of life in the City of Davis and beyond.

"Davis is the only place in the country where people can bike for all their



transportation needs. I was interested in how that came to be and wanted to know if other towns might be able to have similar transportation systems," said Buehler.

"I wanted to understand what conditions would make it better for Americans to get on their bikes, and to apply those conditions more effectively in other places to help solve our environmental problems."

It started as a simple look at the history of bicycling in Davis. Buehler labored for countless hours in the basement archives of Davis City Hall to unearth the root of the town's bicycling culture. He conducted multiple interviews with community bike leaders, historians and advocates; current and former city staff and elected officials; and university representatives.

UC Davis Chancellor Emil Mrak championed bicycling on campus in 1961.

The campus's Long Range Development Plan in 1963 adopted key pro-bicycling policies. Then in 1963, the Davis City Council adopted laws to crack down on deviant bicyclists and allocated funds to build a (gasp!) downtown parking lot. In response, citizen advocates Frank and Eve Child sparked a revolution. In 1966 a new city council was elected on a pro-bicycling slate. In 1967, the nation's first bike lanes opened, on 3rd Street. Through the '70s, '80s and early '90s, bicycling thrived in Davis.



Bicycle activists Frank and Eve Child in Davis Enterprise, 1976



Bicycling is still the primary mode of transportation on campus today. But elsewhere in the city, car travel is up. Traffic is growing. There's a palpable change. Buehler explored numerous factors contributing to the change and developed a suite of possible solutions.

Then he took his research to the people. A crowd of 300 bicycled to the Varsity Theatre in February when Buehler gave his entertaining and motivating presentation on the history of bicycling in Davis. He also has presented his research to the city's Bicycle Advisory Commission, which is developing a new Davis Bicycle Plan. A new DavisBicycles! advocacy group has a growing membership with committees working on policy, outreach, education, planning, research, media relations, and organization.

Change is coming again, Buehler predicts, prompted in part by other cities' efforts to unseat Davis as the bicycling capital. "I hope my work initiates a new age of public advocacy for improved conditions for bicycling, so that citizens choose a future for Davis that builds upon our past."

Buehler is about to submit the final draft of his thesis to his faculty advisor, Professor Susan Handy. He plans to graduate in June.

STC FELLOWSHIPS: Fall Dissertation Winners

Twice a year, in April and November, the Sustainable Transportation Center awards dissertation fellowships. In 2007, STC expects to be able to offer up to four fellowships of up to \$30,000. Winners from the last round are: Matthew Caldwell, Changzeng Liu and Jingtao Ma.

Matthew Caldwell is working with Professor Paul Erickson on sustainable fuel pathways. He is examining the role that biofuels and new biomass conversion technologies can play now and their possible future role as a low-cost renewable source of hydrogen. In particular, the development of a large biofuels industry and infrastructure could lead to a viable and economic hydrogen introduction pathway when using low-grade alcohols, which are less costly and less energy intensive than current



L-R: Matthew Caldwell; Changzeng Liu; Jingtao Ma

ethanol production from corn.

Changzheng Liu is working with Professor Yueyue Fan to develop models and algorithms that consider a variety of factors to help the state make critical decisions about highway and bridge repairs and retrofits. Properly functioning transportation infrastructure is important in day-to-day life, and it's even more critical during and after emergencies such as natural disasters. Optimizing maintenance decisions will help to ensure the long term viability of our transportation system and contribute to sustainability goals.

Jingtao Ma is working with Professor Michael Zhang to design mathematical models of balanced traffic control strategies. He seeks to develop models that consider not just efficiency – getting travelers from point A to point B in the fastest, least fuel-consuming fashion – but also equity or user fairness. As the traveling public is more involved in the decision-making process, balanced efficiency and equity will become an important design criterion for new or updated control systems.

Education Highlights

LITTLE BANG: Two Compete, One Advances

Two ITS-Davis student teams competed recently in the Little Bang! Business Plan Competition and one team advanced to the next round, the Big Bang! Business Plan Competition. Big Bang! is the annual UC Davis Business Plan Competition organized by MBA students of the Graduate School of Management. The goal of the contest is to promote entrepreneurship at UC Davis and throughout the region supported by the University.

Student Kurt Kornbluth's team advanced to the finals with their Smart Fridge concept. The Smart Fridge is a device that can be installed in an existing refrigerator or integrated into a new fridge. It acts as an energy storage device in "off-the-grid" renewable energy applications becoming more common in developing countries. In grid-enabled applications, it communicates with the utility or power generator to act as a load leveling device.

Working with Kornbluth were Ingrid Neumann of the Physics Dept., Transportation Technology and Policy student Ryohei Hinokuma, and Tracy Twist, a GSM alumnus.

The other ITS-Davis student team, SuiteFleet, led by Tai Stillwater, is refining its plan for next year's competition.



Kurt Kornbluth with his Smart Fridge prototype

JUGGLING WORK AND SCHOOL: Ph.D. Candidate Works from a Distance



Jill Hough with Federal Transit Administration administrator Jim Simpson, in Washington, D.C. in January

For the last seven years, Ph.D. candidate Jill Hough, originally from Minnesota, has been juggling full time work half-way across the country while completing her dissertation. After graduating this summer she looks forward to devoting her complete attention to her career as director of the Small Urban and Rural Transit Center (SURTC) within the Upper Great Plains Transportation Institute at North Dakota State University.

"I would not recommend working on a Ph.D. from a distance," she says with a laugh, noting that she's taken on a significant burden and misses the interaction with professors and researchers at UC Davis. But her position with the North Dakota institute similar to ITS-Davis affords her the flexibility to travel back to California when necessary. "It helps that I'm working for an academic institution where a Ph.D. is valued."

That still doesn't make her accomplishments any less amazing. Hough started working at the Upper Great Plains Transportation Institute in 1990 while she was a master's student. She stayed on full time, then decided to pursue a Ph.D. several years later to improve her research skills and gain a better understanding of

transportation problems and issues.

“One of the reasons I chose Davis is that I didn’t want to go to a straight econ program. I wanted to be able to address the issues in a more multidisciplinary way.”

Hough moved temporarily to Davis to complete her course work in the fall of 1999 and lived here through 2000. While here, she wrote a funding proposal for a small urban and rural transit program in North Dakota and traveled to DC during breaks seek support. Eventually Hough’s work paid off with a Federal Transit Administration grant to create SURTC in 2002.

Now funded by a variety of federal, state and regional grants, SURTC provides transportation research, education, and service to several states in the Midwest, with a focus on public transportation and the mobility and accessibility of residents of small urban and rural locations.

Hough credits her advisor, Professor Susan Handy, with encouraging her from afar and making things click. “Susan was really interested in my topic and in helping me move forward. And she could tell that I was really passionate about this issue. She’s my favorite thing about Davis.”

Hough’s daily work life and academic research pursuits coincide nicely. Her dissertation is examining the mobility needs of elderly women living in rural and small urban locations and the factors that contribute to their circumstances. Her findings are based on telephone surveys of women over age 65. With perseverance, she has collected 1,021 responses.

“I was motivated by really wanting to improve mobility in society. It’s particularly challenging for people in rural and small urban areas, because they don’t have as many options. I’ve done work with logistics, freight and goods movement. It’s all interesting, but the people part, the passenger part, is more intriguing to me.”

Research Results

TOURING TEXAS: ITS-Davis at National Hydrogen Association



Prof. Joan Ogden in Texas

A team of ten students, researchers and faculty represented ITS-Davis at the National Hydrogen Association annual conference in Texas last month. They gave presentations and posters, moderated sessions, and mingled with industry and academic experts from around the world. Following is a list of presentations. In most cases, the person whose name is listed first on the paper gave the presentation or poster. Professor Joan Ogden also attended NHA as a session moderator.



ITS Booth at NHA

“Characterizing Gasoline Station Networks: Relevance for Early Hydrogen Stations”
Joel Bremson and Marc Melaina

“Transitional Dynamics Toward a Hydrogen Economy”
Anthony Eggert

“Optimized Pathways for Regional Hydrogen Infrastructure Transitions:
Case Study for Southern California”
David Lin, Steven Chen, Yueyue Fan, Joan Ogden

“Simulating a Hydrogen Infrastructure Rollout in Los Angeles, California”
Marc Melaina, Marshall Miller, Michael Nicholas and Joan Ogden

“Emissions and Cost Impacts of Marginal Electricity Demand for Hydrogen Supply Pathways”
Ryan W. McCarthy, Christopher Yang, and Joan M. Ogden

“Projecting Consumer Demand at Hydrogen Stations: Learning From Current Gasoline Demand Patterns”

Mike Nicholas

“Optimal Design of Hydrogen Production from Agricultural Waste”

Nathan Parker

“A Steady-State Fuel Pathway Model for Hydrogen Infrastructure Costs and CO2 Emissions in U.S. Urban Areas”

Christopher Yang and Joan Ogden

FUEL TAXES AND TRANSPORTATION: Mr. Sperling goes to Washington

ITS-Davis Director Dan Sperling winged his way to Washington last month to testify before a subcommittee of the House Transportation and Infrastructure Committee on the impacts of fuel economy and alternative fuels on the viability of the federal fuel excise tax.

Sperling, who served on the 2005 National Academies committee that drafted the report, “The Fuel Tax and Alternatives for Transportation Funding,” directed his comment to two concerns: how to assure adequate funding for transportation, and how to reduce greenhouse gas emissions from transportation.

Despite concerns of many leaders in the transportation community that rapid reduction in gasoline use and rapid introduction of alternative fuels will empty the Transportation Trust Fund, Sperling said, “Absent dramatic and unexpected changes, the structure of the gas tax is not threatened for some time.”

He told Congress concerns about large drop-offs in fuel tax revenues are unlikely for the next 10 years. The bigger issue, Sperling continued, is that more funding is needed for transportation, and Congress and the state legislatures have been unwilling to raise fuel taxes to provide those funds.

He offered three recommendations:

1. In the near term, Congress and state legislatures should have the political courage to increase taxes on gasoline and diesel fuels to temporarily solve transportation funding problems.
2. Congress should create a longer term solution by restructuring the gasoline and diesel tax to accommodate increasing use of alternative fuels. Tax rates could be designed to impose lower fees on low-carbon fuels, such as cellulosic biofuels, and higher rates on high-carbon fuels, such as gasoline produced from tar sands. This can be done in a way that assures continued increases in the overall revenue stream.
3. Congress should tighten fuel economy standards for vehicles and introduce low-carbon fuel standards for energy providers (as planned for California and the European Union).



TOP 25: UC Davis Researchers Top the Hottest Download Lists

Several UC Davis and ITS-Davis affiliated researchers' publications made it to Science Direct's Top 25 Hottest Articles Downloaded during October, November and December 2006. They include:

[Telecommunications and travel demand and supply: Aggregate structural equation models for the US](#)

Transportation Research Part A: Policy and Practice, Volume 41, Issue 1, 1 January 2007, Pages 4-18; Choo, S.; Mokhtarian, P.L.

[A retail and lifecycle cost analysis of hybrid electric vehicles](#)

Transportation Research Part D: Transport and Environment, Volume 11, Issue 2, 1 March 2006, Pages 115-132; Lipman, T.E.; Delucchi, M.A.

[Multivariate uncertainty analysis of an integrated land use and transportation model: MEPLAN](#)

Transportation Research Part D: Transport and Environment, Volume 11, Issue 3, 1 May 2006, Pages 191-203; Clay, M.J.; Johnston, R.A.

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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ITS-Davis and Campus Highlights

ITS-DAVIS PEOPLE: Faculty and Student Accomplishments



Anthony Eggert and Prof. Joan Ogden

Professor **Debbie Niemeier** has been named Editor-in-Chief of *Transportation Research Part A*, one of the premier academic publications in the world.

ITS-Davis Director **Dan Sperling** has been appointed to the California Air Resources Board, the governing body of the state agency charged with establishing and defending the state's air pollution laws. Gov. Arnold Schwarzenegger appointed Sperling to the seat reserved for a person with expertise in automotive engineering or a closely related field.

"It is an honor to be appointed to the world's premier air agency," Sperling said. "I bring to the position both the desire to serve the state—to help make California a cleaner, healthier place to live—and the technical and engineering expertise to provide the needed perspective to the board. I'll use my strong scientific background to guide my decision-making."

Professor **Joan Ogden** has received the 2007 Distinguished Scholarly Public Service Award. The honor is awarded to four faculty members each year by the Academic Senate for voluntary service in the scholar's field of expertise. It recognizes professors for unpaid dissemination of information from their discipline to the public and nonprofit sector. Ogden is co-director of the Institute's new Sustainable Transportation Energy Pathways (STEPS) Program. She served on the Blueprint Plan advisory panel for the California Hydrogen Highway Network in 2005.

Ph.D. student **Anthony Eggert** has been named an Eno Fellow for 2007, one of 20 outstanding students recognized annually by the non-profit Eno Transportation Foundation. Eggert will participate in the week-long Eno Leadership Development Conference in Washington, D.C., in May. The Eno Fellows Class of 2007 includes representatives from 17 campuses located in 14 states.

Ph.D. Student **Adam Henry** has been invited to Harvard's Kennedy School of Government for one year as a Giorgio Ruffolo Pre-doctoral Fellow in Sustainability Science. Henry, who is this year's Transportation Technology and Policy program student representative, is examining policy networks in regional transportation and land use planning.

ITS-DAVIS PEOPLE: Hellos and Goodbyes

ITS-Davis welcomes **Dahlia Garas**, program manager, UC Davis Plug-in Hybrid Electric Vehicle Research Center. Garas, who will work with center director Tom Turrentine, earned her Master's Degree in Mechanical and Aeronautical Engineering here at UC Davis in 2005 and conducted research in Professor Andy Frank's hybrid vehicle lab, home of the legendary UC Davis plug-in hybrid vehicle design program. She returns to Davis having most recently worked in the electric vehicles testing group at Southern California Edison.

Also joining the ITS-Davis staff is **Aaron Singer-Englar**. Another of Professor Frank's researchers with experience in plug-in hybrids, Singer-Englar recently obtained a Master's Degree in Materials Science Engineering from UC Davis, and will serve assistant program manager for the STEPS program. He will be instrumental in launching the first few events for the new program, supporting fundraising efforts and maintaining the STEPs website.



Dahlia Garas and Aaron Singer-Englar

Another new face around the Institute office is **Por Souza Vue** who was an undergraduate student assistant before graduating in December. ITS-Davis welcomes her into a newly created staff position as a financial/development assistant.

The Institute bids farewell to Are Gjellan, program manager of the Hydrogen Pathways research program. He was instrumental in providing consistent management of the program, and did a great job of wrapping up the program, organizing the final deliverables and keeping the sponsors informed.

PICNIC DAY: Despite the Rain, They Came, They Rode, They Smiled



Lining up to ride in fuel cell vehicle

Despite steady rainfall, hundreds stopped by to test drive clean fuel vehicles and visit with Institute of Transportation Studies students, staff and faculty during the campus's annual open house in mid-April. Picnic Day



Student-designed Pedal-Electric Tricycle

2007 was another big success.

HOT STUFF: Chili Cook-Off a Searing Success



Chef Roberta Devine

Staff, students and researchers flocked to the ITS-Davis conference room recently to test the entries in the First Annual ITS-Davis Chili Cook-Off. Three staffers and one grad student submitted entries. (One enthusiast submitted two recipes for the judges.) The winning entry: Roberta Devine's husband Jack's "evil" recipe known as Cache Creek Hillbilly Chili. We're already placing orders for next year's event.

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

Dan Sperling, April 3, in *The Sacramento Bee*, on the U.S. Supreme Court decision that CO₂ is an air pollutant and EPA has authority to regulate greenhouse gas emissions from vehicles.

Marshall Miller, April 1, in *Fortune Small Business*, in an article on Peoria Ill., promoting green business technologies.

Chris Knittel, March 30, in *The New York Times* in an article highlighting his research conducted with Dan Sperling and Jonathan Hughes on fuel price impacts on gasoline consumption.

Student Obadiah Bartholomy, March 4, in *The Sacramento Bee*, on a carbon offset program he is developing for his employer, Sacramento Municipal Utility District.

Andrew Frank, March-April, in *American Scientist*, in a lengthy article he wrote about plug-in hybrids.

Andrew Frank, Monterey Gardiner and former ITS-Davis staffer John Tillman, the week of February 12, in a multi-part series on *Fox TV* in Los Angeles, on alternative fuel vehicles.

Ted Buehler, February 23, in the *Davis Enterprise*, on his research on the history of bicycling in Davis.

Dan Sperling, early February, on public radio's *The California Report*, about the state's low carbon fuel standard and vehicle technologies, and again on February 11 in *The Sacramento Bee*.

Chris Knittel, February 2, in *The Sacramento Bee*, on Bank of America offering employee incentives to purchase hybrid vehicles.