



# e-news



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](#).

Contents

Issue 13

April 2003

- [Research Highlights](#)
  - [LINKING TRANSPORTATION WITH PUBLIC HEALTH: Community Design a Factor in Healthy Lifestyles](#)
- [Research Results](#)
  - [HIT THE ROAD, JACK: Come Back With Valuable Survey Data](#)
  - [TO WASHINGTON WE GO: UC Davis Well-Represented at Annual TRB Meeting](#)
  - [AIR POLLUTION RESEARCH: UC Davis Researchers Offer Hypothesis on Particulate Matter](#)
  - [TRANSPORTATION PUBLICATIONS FROM UC DAVIS: Hot off the Presses](#)
- [Education Highlights](#)
  - [AWARDS AND RECOGNITION](#)
  - [TRAVELING FOR ITS OWN SAKE: Multidisciplinary Graduate Seminar](#)
- [ITS-Davis and Campus Highlights](#)
  - [ELECTRIC/HYBRID VEHICLE DEVELOPMENTS IN CHINA: Davis Workshop Draws International Crowd](#)
  - [DEVELOPMENT UPDATE](#)
  - [EXTRA! READ ALL ABOUT IT: ITS-Davis and UC Davis Colleagues in the News](#)

## Research Highlights

### LINKING TRANSPORTATION WITH PUBLIC HEALTH: Community Design a Factor in Healthy Lifestyles



Susan Handy frequently commutes to campus on her bicycle

ITS-Davis faculty members Susan Handy and Pat Mokhtarian are expanding the scope of transportation research at UC Davis by examining the link between transportation and public health. Through their participation in separate national committees, Handy and Mokhtarian will offer the latest academic thinking on transportation planning, community design, and travel behavior as it relates to a subject that is gaining national focus: obesity.

Handy has been named to the National Academy of Sciences Institute of Medicine Committee on Prevention of Obesity in Children and Youth. Mokhtarian has been named to the Committee on Physical Activity, Health, Transportation and Land Use, a joint committee of the Transportation Research Board and Institute of Medicine. Handy has also been named to a similarly focused national advisory committee for the Robert Wood Johnson Foundation's Active Living by Design program.

The Institute of Medicine Committee on Prevention of Obesity in Children and

Youth is examining issues related to diet and physical activity, and their links to community planning. The only planner named to the committee, Handy says she will bring a unique perspective to the group. “We’ll be looking at questions such as, ‘How do we create communities that are more conducive to physical activity, where kids can bike and walk instead of being driven everywhere?’”

Handy attended the first meeting of the Institute of Medicine committee in mid-February via conference call. The committee is charged with creating an action plan for the prevention of obesity and will be looking at efforts around the country to implement innovative policies and programs. “One committee member suggested we hold a meeting in Davis, so that we can experience first-hand a community designed for physical activity,” Handy exclaims. “It’d be really fun to take the committee on a bike tour of Davis!”

Mokhtarian’s Committee on Physical Activity, Health, Transportation and Land Use is looking at obesity as a negative outcome of our nation’s car culture—but also plans to examine other issues, such as safety, building design and psychology. For example, peoples’ propensities to walk are affected by their perceptions of whether it is safe to walk in their neighborhoods. Some planners contend that if buildings were designed with lighted, clean and easily accessible stairs, located prominently and opening into a lobby instead of into a well-hidden hallway behind heavy doors, perhaps people would more often use the stairs instead of the elevator.

Mokhtarian warns that such concepts as urban and building design, alone, will not solve our obesity problems. “I’m also getting them to look at the fundamental psychological decisions people make about where they live, how they get around, and how they want to look and eat. What is it that lets people get out of shape? The point is, there are a lot of things that land use, building design, and transportation can’t fix,” Mokhtarian continues.

Mokhtarian’s committee, which is chaired by Prof. Susan Hanson, a geographer at Clark University, has met and is in the process of commissioning papers to be presented at a conference in November. The committee is comprised of roughly half medical experts, half transportation and/or urban planning experts, Mokhtarian reports.

Handy and Mokhtarian are among a small group of transportation planners around the country who are building bridges with the public health community on this issue. “The two communities have not previously interacted much, and it is exciting to be a part of this new dialogue,” Handy says.

Handy and Mokhtarian are also working on a Caltrans-funded project that examines the link between residential location choice, auto ownership and travel behavior. They are asking questions such as: Do people consciously choose neighborhoods where walking and biking are appealing? Does the design of the neighborhood influence how much they walk and bike once they get there?

In addition, Handy’s seminar class, “The Transportation and Land Use Connection” is examining some of these issues. She expects her involvement on these national committees will stimulate creative thought in her own research and in her teaching.



Bikes are a way of life in Davis

---

[| ITS-Davis Home](#) | [Top](#) | [Research Highlights](#) | [Research Results](#) | [Education Highlights](#) | [ITS-Davis and Campus Highlights](#) | [e-news archives](#) |

## Research Results

### HIT THE ROAD, JACK: Come Back With Valuable Survey Data

During the first two months of this year, 18 UC Davis students got a first-hand taste of life on the road for a typical long-haul truck driver as part of an ongoing project that is evaluating the feasibility of using fuel cells as auxiliary power units (APUs) in trucks. The students conducted field research and gained real-world experience with administering surveys at a handful of truck stops across the nation under a research project directed by ITS-Davis Researcher C.J. Brodrick.



TravelCenters of America truck stop where surveying was conducted in Cartersville, GA

For six weeks in January and February several teams of two to three students fanned out across the country—to places like Cartersville, Ga.; Portland, Ore.; Columbia, NJ; Richmond, Va.; Elgen, Il.; and Lodi, Ohio—to talk to drivers about how, where and when they idle their trucks. This is the first of two phases of data collection. Prof. Pat Mokhtarian will join the team for a summer survey that will look in-depth at drivers' attitudes toward new technology.

Truckers idle their diesel engines to power cab accessories such as heat or air conditioning during mandated rest stops. The idling, however, results in significant fuel consumption, fuel and maintenance costs, and emissions—much of which researchers believe could be avoided. The trucking industry has sought alternatives that curb idling but do not compromise driver rest (safety) or create economic hardships. The fuel cell auxiliary power unit (APU) offers a potential solution that is quiet, nearly pollutant-free, and fuel-efficient.

Before researchers can assess alternatives to idling, they must know more about the practice. What is the average idling duration? Where does it occur and what is it powering? What is the truck driver's motivation for idling? What is his level of concern for idling? What are fleet policies regarding idling? How do seasons and geographic location impact idling?

Addressing some of these questions is the goal of this research project.

Dr. Brodrick, with PhD students Nic Lutsey (Transportation Technology and Policy) and David Grupp (Mechanical and Aeronautical Engineering), developed a 10-page survey that generally took about 45 minutes to complete. They collected about 500 usable surveys and received a 50 percent response rate. The preliminary findings are fascinating, Brodrick says.

Because there is limited parking space at truck stops, truckers often park somewhere else, such as at a rest area, or along a quiet side road. Frequently they are ticketed for idling and parking illegally, and are told to move their rigs—even during their required non-drive time, Brodrick explains.

"We were surprised at the number of drivers who reported being ticketed," Brodrick says. She also was surprised that the early results show truckers only idle for an average of six to eight hours. During the remaining hours of their required downtime, they're socializing and participating in recreational activities at the truck stop, such as karaoke.



UC Davis Researcher Ryan McCarthy solicits more truck drivers to complete surveys at a truck stop in Cartersville, GA



Trucks, mostly idling, at a truck stop in Cartersville, GA

The project, funded by Freightliner, LLC, and Sverdrup, is the first phase of a methanol fuel cell APU analysis. It is part of a larger series of U.S. Department of Energy-funded projects being conducted in cooperation with TIAX, that are assessing the technical and economic feasibility of using fuel cells as APUs. TravelCenters of America, a truck stop corporation owned by Freightliner, facilitated the research.

"Freightliner's support enabled us to have necessary access to the drivers," Brodrick notes. "Previously, when we just did surveys in California, we went to rest stops and weight stations where the drivers were rushed." In addition, she adds, having the truck stops' support ensured the surveyors' safety and a higher degree of success in

collecting responses.

In addition to collecting valuable data, Brodrick notes the real-world experience was invaluable for students. "It's important for students to supplement textbook work with some real-world experiences that present data gathering and processing challenges,"

### TO WASHINGTON WE GO: UC Davis Well-Represented at Annual TRB Meeting

At least 25 UC Davis researchers, faculty and students represented the broad spectrum of transportation research on campus at this year's Transportation Research Board Annual Meeting in January. From travel demand modeling and alternative modes, to pavement research and environmental impacts, UC Davis researchers chaired sessions and committee meetings, presented papers, and spoke at poster sessions. ITS-Davis also held a reception, which was well attended.

[Click here](#) for a summary of their presentations.



Pat Mokhtarian chats with Caltrans Director Jeff Morales at ITS-Davis's reception during TRB in January

### AIR POLLUTION RESEARCH: UC Davis Researchers Offer Hypothesis on Particulate Matter

Scientists studying fine particle air pollution recently have focused intently on microscopic particles, roughly 1-2 nanometers in diameter, because of their possibly negative effects on human health and their potential to grow into cloud condensation nuclei, thus affecting cloud formation as well as the global radiation budget.

UC Davis Department of Mechanical and Aeronautical Engineering researchers K. Max Zhang and Anthony S. Wexler have developed a hypothesis about the growth of new particles in the atmosphere that focuses on diesel and automobile exhaust.

"I think this will end up being very important to understanding the contribution of vehicle emitted particles to ambient air quality," says Wexler, an ITS-Davis faculty affiliate.

Wexler and Zhang's work will be highlighted in an upcoming article, "A hypothesis for growth of fresh atmospheric nuclei," to be published in the Journal of Geophysical Research.

### TRANSPORTATION PUBLICATIONS FROM UC DAVIS: Hot off the Presses

#### This Issue's Highlight

**Catalytic Burner for an Indirect Methanol Fuel Cell Vehicle Fuel Processor** Sundaresan, M., Ramaswamy, S., Moore, R. M., Hoffman, M. A., Journal of Power Sources, January 2003 pp.19-36. Publication No. UCD-ITS-RP-03-1

The lack of hydrogen infrastructure and onboard hydrogen storage represent the primary impediments to the wide-scale implementation of hydrogen/air fuel cell vehicles. One proposed source of hydrogen is onboard methanol (and other hydrocarbon) fuel processors. However, onboard reformation faces packaging limitations and fuel processor performance constraints on efficiency and transient response. This recently published paper highlights research conducted at UC Davis on the effects of the catalytic burner on reformer performance in a thermally well-integrated configuration. It is significant because it addresses the proper thermal integration between two major components of the fuel processor, the reformer and catalytic burner, in a fuel cell vehicle.

#### Also New This Month:

**FreedomCAR and Fuel Cells: Toward the Hydrogen Economy?** Sperling, D., Progressive Policy Institute, Policy Report, January 23, 2003. Publication No. UCD-ITS-RP-03-2

Publications can be ordered by fax, e-mail or mail. Some are now available online.

ITS-Davis has recently completed an extensive update of its publications list and is in process of getting all research reports in downloadable pdf format online.

**Ordering information:** <http://www.its.ucdavis.edu/publications>

**E-mail:** [itspublications@ucdavis.edu](mailto:itspublications@ucdavis.edu)

**Fax:** 530-752-6572

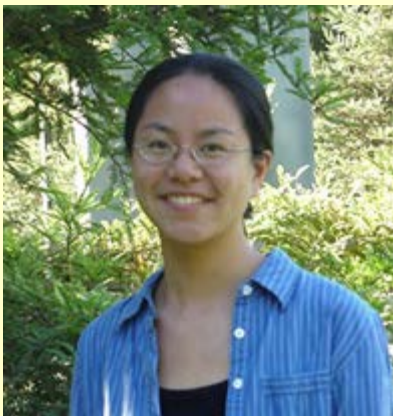
**Mail:** Publications, Institute of Transportation Studies, UC Davis,  
One Shields Avenue, Davis, CA 95616-8762

A List of Fuel Cell Vehicle Modeling Program Papers is located at [http://fcv.ucdavis.edu/fcvprog/FCVMP\\_Publications\\_rev1.html](http://fcv.ucdavis.edu/fcvprog/FCVMP_Publications_rev1.html)

[| ITS-Davis Home](#) | [| Top](#) | [| Research Results](#) | [| Education Highlights](#) | [| ITS-Davis and Campus Highlights](#) | [| e-news archives](#) |

## Education Highlights

### AWARDS AND RECOGNITION



Belinda Chen

#### EPA STAR Fellowship

Belinda Chen, a first-year master's student working toward a PhD, has received the Environmental Protection Agency's STAR (Science to Achieve Results) Program fellowship. The purpose of the fellowship program is to encourage promising students to obtain advanced degrees and pursue careers in environmentally related fields. The fellowship will cover tuition and academic fees, and provide a stipend and expense allowance for Chen for three years. Chen is studying advanced vehicle technology and greenhouse gases.

#### Eisenhower Travel Award

Deborah Salon, a PhD candidate in Agricultural and Resource Economics, received a Dwight David Eisenhower Transportation Fellowship travel award, which funded her trip to TRB and will enable her to attend several other meetings this year.



Deborah Salon

Salon's working dissertation is titled, "Cars and the City: In Pursuit of Transport and Residential Choice Patterns Among Urban Residents." Salon is analyzing survey data from New York City in an attempt to discover, among other things, the determinants of car ownership and use in a dense urban environment with high availability of public transit.

#### Distinguished Researcher

UC Davis Civil and Environmental Engineering Alumnus Dr. Mohamed Abdel-Aty was recently named Distinguished Researcher of the Year for the College of Engineering and Computer Science at the University of Central Florida in Orlando, where he is an associate professor.

### TRAVELING FOR ITS OWN SAKE: Multidisciplinary Graduate Seminar

ITS-Davis Professor Patricia Mokhtarian is offering a unique new multidisciplinary graduate seminar this quarter. Her mission? To question the notion that travel is a necessary evil, and instead consider that, under some circumstances, travel is a desired end in itself.

Just how broad might the subject matter be? Mokhtarian offered a list of 19 possible course discussion topics. A few are listed below:

**African American and African Studies/Native American Studies/Chicana/Chicano Studies/East Asian Languages and Culture:** Are there ethnic and other cultural differences in travel attitudes and behavior? How have issues of equity impacted the transportation industry?

**Agricultural and Resource Economics:** How has our desire for travel impacted our use of land?

**Anthropology:** Do nomadic societies offer any insight into modern-day restlessness?

**Classics/Comparative Literature/English/Humanities:** How has the “travel as metaphor” idea been expressed in literature/poetry/song, both classic and modern?

**Geography:** How do those in different parts of the country (e.g., rural versus urban) relate to automobiles differently? Do they have different emotional responses? How has our willingness/enjoyment to travel/re-locate shaped the distribution of populations across the US? Other countries?

**Law/Political Science:** Is there a legal “Right to Mobility” as political science professor Gerald Houseman has argued in his book of the same name? How do prisoners, who are deprived of mobility, view travel for its own sake?

**Religious Studies:** What role does the journey itself, as opposed to the destination, play in the spiritual value of the religious pilgrimage?

**Sociology:** How has our society embraced, often very emotionally, the automobile? Why are we emotionally drawn to other forms of transportation, such as walking, flight, boating, etc.? For many, a mode of transportation is also a home. Why do some individuals prefer to live in Recreational Vehicles (RVs) or boats or other moving homes? How have the cruise ship and RV industries changed over time?

**Women and Gender Studies:** Are men the wandering hunter/gatherers and women the stay-at-home nest builders? Is there scientific evidence on different “wiring” with respect to mobility? How have mobility constraints been used to oppress women?

Mokhtarian says she is quite excited about this seminar. “In my 13 years at UC Davis I don’t remember seeing another graduate course being advertised having potential appeal across such a broad spectrum of specialties.”

---

[ITS-Davis Home](#) | [Top](#) | [Research Results](#) | [Education Highlights](#) | [ITS-Davis and Campus Highlights](#) | [e-news archives](#) |

## ITS-Davis and Campus Highlights

### ELECTRIC/HYBRID VEHICLE DEVELOPMENTS IN CHINA: Davis Workshop Draws International Crowd

Approximately 40 people attended a workshop on Electric/Hybrid Vehicle Developments in China on the UC Davis campus in December. Professor C.C. Chan, a visiting professor from the Chinese Academy of Engineering at Hong Kong University, ITS-Davis Research Engineer Andrew Burke, and ITS-Davis Director Dan Sperling led the workshop.

Attendees heard presentations on the state-of-the-art of electric and hybrid vehicle development in China, the United States and elsewhere, and discussed technical and commercialization issues, and strategies for fostering international collaboration among governments, industries, and academia. A CD of the presentations is available from ITS-Davis at [itsconference@ucdavis.edu](mailto:itsconference@ucdavis.edu).

### DEVELOPMENT UPDATE

Support from individuals, foundations, industry and government is integral to ITS-Davis’ programs. We are pleased to acknowledge the following gifts and grants since we last reported such in *ITS-Davis e-news*.

#### Individual Major Gifts:

- Jake Peters – \$15,000 to support new mobility systems research
- Neil Otto – Three Ballard Power Systems fuel cell stacks

#### Corporate Affiliate Program:

- ExxonMobil, Nissan Technical Center North America/Nissan North America, Toyota Motor Sales – Patron Level support of \$40,000/year
- Aramco Services Company, Chevron Products Company, Subaru, Superfarad Svenska AB, Volvo Group – Membership support of \$15,000/year or more

#### Fuel Cell APU Research Program:

- Freightliner – Heavy-duty diesel truck
- TaylorMade Environmental – Air conditioner/heat pump
- Webasto – Diesel Heater Unit
- Xantrex – Inverter

**Transportation and the Hydrogen Economy Research Consortial.** The following companies contributed \$50,000 to become Program Sponsors for 2003:

- BP America
- ConocoPhillips
- ExxonMobil
- Honda R&D Americas
- Nissan Technical Center North America
- Shell Hydrogen (U.S.)
- Toyota Motor Sales

**Fuel Cell Vehicle Modeling Program.** ITS-Davis gratefully thanks the Supporting Donors of the Fuel Cell Vehicle Modeling Program. The program concluded its five-year research agenda in December 2002.

• Supporting Donors of \$100,000 over the five years included: BP, ChevronTexaco, DaimlerChrysler, ExxonMobil Research and Engineering, Fiat Research Center, Ford Motor Company, General Motors Global Alternative Propulsion Center, Honda R&D Americas, Inc., Hyundai Motor Company, Nissan Technical Center North America, Petrobras, Regenesys Technologies Limited, Ricardo Consulting Engineers, Schlumberger-Doll Research, Subaru Research Center, Toyota Motor Company and Volkswagen AG.

• Donors providing partial support included: Daewoo Motor Company, Eaton Corporation, Isuzu Advanced Engineering Center, U.S. DOE, California Air Resources Board, and XCELLSiS.

**Additional Gifts and Research Grants:**

- ChevronTexaco – \$9,250 for Chevron Fellowship
- California Air Resources Board – \$200,000 for transportation sector greenhouse gas research
- DaimlerChrysler – \$9,200 to support travel demand research
- ExxonMobil – \$80,000 for hybrid/ICE/EV research
- Toyota Motor Corporation – \$15,000 China Auto Industry Research

**Friends of ITS-Davis**

The Institute launched **Friends of ITS-Davis** last fall to build support from individuals. Donations to **Friends** will enhance student fellowships and projects, and seed new research programs. The Institute's goal is to secure a high percentage of participation from alumni and other followers, and to initiate a legacy of individual giving to ITS-Davis. Chaired by Norm Bryan, an ITS-Davis Board of Advisors member, the founding executive committee includes recent graduates Patricia Hendren and Joshua Cunningham, current student Chris Congleton, faculty Patricia Mokhtarian and Dan Sperling, and Joe Krovoza, the Institute's development director.



Already, **Friends of ITS-Davis** is off to a tremendous beginning. General Hydrogen has donated \$20,000 to **Friends** to be used to match the first twenty \$1,000 gifts. This will provide a wonderful incentive for some individuals to make exceptional first gifts to launch the **Friends** program. ITS-Davis Board Members Paul MacCready, Neil Otto, Norm Bryan and Geoffrey Ballard (Chair), and Dan Sperling have all made gifts to qualify for the first five matches. Thank you, in advance, to everyone who helps with this important new ITS-Davis initiative.

**EXTRA! READ ALL ABOUT IT: ITS-Davis and Associated UC-Davis Colleagues in the News**

Dan Sperling, in *Nature*, March 13, on the need for more university involvement in the FreedomCAR research program.

Dan Sperling in *The Washington Post*, March 5, in an article on General Motors and Shell Hydrogen's partnership in a fuel cell demonstration fleet in Washington, D.C.



ITS-Davis Researcher Ken Kurani talks to reporters outside the Mondavi Center during a press event featuring the new Toyota FCHV

Andy Frank, in [www.evworld.com](http://www.evworld.com), March 2, in a feature on his research and development of plug-in hybrid vehicles.

Ken Kurani, Tom Turrentine and Dan Sperling in *The Mercury News*, (San Jose, Calif.) February 23, in an article on fuel cell progress and challenges facing vehicle development and commercialization.

Dan Sperling in a Q&A article prepared by the Electric Drive Transportation Association, February 21, as part of its Industry Leader Interview Series.

Michael Zhang in *The Sacramento Bee*, February 18, in an article explaining how physics studies help traffic go with the flow.

The photo on the right appeared in the *Davis Enterprise* February 2, with the following caption: "UC Davis Institute of Transportation Studies Davis researcher Paul Erickson, right, and graduate student Matt Caldwell discuss the fuel-cell engine of the Toyota FCHV-4, which runs on hydrogen and gives off only water vapor. The occasion was a news conference Friday on campus. A proposal by the institute's director, Daniel Sperling, for research of zero-emissions fuel-cell vehicles, called 'FreedomFUEL,' was endorsed Tuesday by President Bush in his State of the Union address. A similar fuel-cell-powered Toyota Highlander SUV being studied at UCD is on its way to the White House for a news conference Thursday." (Editor's note: Paul Erickson is assistant professor of Mechanical and Aeronautical Engineering.)



Following President Bush's State of the Union address in late-January, UC Davis's phones rang off the hook; reporters from around the world sought comment from the campus's many experts on alternative fuels, hydrogen, fuel cells, petroleum dependence and related environmental topics. UC Davis researchers talked to reporters from *Tech TV*, *CNN*, *TIME Magazine*, *National Public Radio*, *CBS Sunday Morning*, *Wall Street Journal*, and a host of local Sacramento media.

Patricia Mokhtarian in *Financial Times*, January 23, 2003 and *Reader's Digest*, December 2002, on her recent study finding 42% of respondents satisfied with the length of their commute, and 7% saying they'd actually like it to be longer.

Anthony Eggert and Dan Sperling on *National Public Radio*, December 27, on fuel cell research and Toyota FCVs coming to Davis, as part of a series on U.S. oil dependence.

The December issue of *e-news* featured the announcement that the first Toyota fuel cell vehicles would be tested at UC Davis and UC Irvine. That story received significant and ongoing news coverage over the following weeks, including in the following publications and media outlets:

- Detroit News*, December 15
- Long Beach Press Telegram*, December 9
- Topeka Capital-Journal* (Kansas), December 8
- Oakland County Press* (Michigan), December 7
- Environmental News Service*, December 4
- Discovery.com News Service*, December 4

Close to 150 reporters, congressional staff, and dignitaries attended an early December 2002 press briefing in Washington, D.C. featuring Dan Sperling and Harvard University's Richard Forman, co-authors of the newly published book, *Road Ecology: Science and Solutions*. Feature articles appeared in the following:

- Land Letter*, December 5
- Bureau of National Affairs*, December 4





*Congressional Quarterly*, December 3

Road Ecology press briefing. L-R: Tom Deen, executive director, TRB; Richard Forman, lead author; Dan Sperling, ITS-Davis; Kevin Heanue, co-author and former U.S. Highway Administration official