



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 conduct transportation-related research and education. For previous issues, see the [e-news archives](#).

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New Initiatives

CHINA AUTO INDUSTRY EVOLVING: Study Examines Market Barriers, Opportunities and Issues Associated with Increased Auto Availability

ITS-Davis, University of Hawaii, and China Center for Economic Research at Peking University are launching the continuation of a comprehensive study of the automobile industry in China.

Begun in 2000, researchers set out to measure the impact of government intervention on industry structure, product prices, consumer welfare and industrial development in China, and identify the policy changes likely to result from China's impending entry to the World Trade Organization. They identified significant changes likely to result from WTO accession: import tariffs would likely drop to 25 percent over the next five years, import licensing requirements would be eliminated by about 2006, and foreign companies would be able to import vehicles directly within three years of accession. Researchers also reported that accession would likely enable foreign companies to manage their own distribution, sales, and service of vehicles, and non-bank foreign firms to provide unrestricted auto financing.

In this continuing phase, researchers will examine three specific areas where additional research is needed:

1. Non-tariff barriers to multinational automotive investments

Current Chinese leaders fear that the existing domestic auto industry, including the parts, raw materials and service center

industries, could be threatened by an influx of foreign vehicle exporters. They fear unemployment and the resulting severe social instability.

2. Vehicle purchase behavior in Chinese cities

It is easy to assume that the auto market in China will take off, given the country's rapid industrialization and large population. But there is little market intelligence or data because the government has controlled China's market. Researchers will study China's potential car buying population, focusing on markets for privately owned cars in major cities.

3. The expanding agricultural vehicle market

Year one research identified a large indigenous agricultural vehicle industry in China. Little is known about these vehicles. How are they used, who owns them, and what are their energy, emissions, and performance characteristics? In this continuation phase, researchers will explore the important role these simple vehicles play in personal transportation in rural areas and evaluate their environmental impact.

The following distinguished researchers will work on this joint effort:

Robert Feenstra, Director of Pacific Business and Development Program, Professor of Economics, UC Davis

Wen Hai, Deputy Director, China Center for Economic Research, Peking University, and a tenured Associate Professor of Economics at the University of Colorado, Fort Lewis

Eric Harwit, Associate Professor, University of Hawaii, a fluent Chinese speaker, and leading expert on the development of the Chinese automobile industry

Patricia Mokhtarian, Associate Director of ITS-Davis, Professor of Civil and Environmental Engineering

Scott Rozelle, Professor of Agricultural and Resource Economics, UC Davis, whose research focuses almost exclusively on China

Daniel Sperling, Director of ITS-Davis, Professor of Engineering and Environmental Science and Policy

Thomas Turrentine, Research Anthropologist, ITS-Davis, and internationally known vehicle purchase and travel behavior specialist



Robert Feenstra, UC Davis Economics Department

The continuing research is funded by generous contributions from the Energy Foundation, General Motors, Toyota Motor Corporation and DaimlerChrysler Northeast Asia. For information on obtaining past research results and participation in future research, contact ITS-Davis through Joe Krovoza (jfkrovoza@ucdavis.edu; 530-754-6006).

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Research Results

A LONG AND WINDING ROAD: Pew-Funded Research Examines Strategies for Reducing Greenhouse Gas Emissions in Developing Countries

In the continuation of a series of reports co-authored by ITS-Davis Director Dan Sperling, the Pew Center on Global Climate Change has released two new documents that identify strategies and policies for reducing greenhouse gas emissions in developing countries. The new reports provide an overview and a look at specific strategies in South Africa.

In the overview report, [Transportation in Developing Countries: An Overview of Greenhouse Gas Reduction Strategies](#), Sperling and co-researchers find that transportation-related carbon dioxide



emissions grew at an annual rate of 5.6 percent in the developing countries of Asia between 1980 and 1998. The rate of growth for all developing countries was 4 percent. "If these trends continue," Sperling notes, "the number of motor vehicles in use around the world will double in the next 20 to 30 years, with much of the increase occurring in developing nations." Despite the worrisome projections, the report identifies many inexpensive and attractive options — including advanced technologies and carsharing — to limit emissions growth.

The other report, [Transportation in Developing Countries: Greenhouse Gas Scenarios for South Africa](#), builds on studies released last summer focusing on Shanghai, China, and Delhi, India. (See [E-News Issue #6, September 2001](#)) Lead author, Jolanda Prozzi, is an ITS-Davis graduate in Transportation Technology and Policy. She specializes in transportation economics and policy analysis at the Center for Transportation Research at the University of Texas, Austin.

The report designs two transportation scenarios for South Africa by 2020. The higher, business-as-usual trend projects increases in private passenger car and minibus use with a decrease in public transit use and a stable level of jitney use. Under this scenario, South African greenhouse gas emissions increase by 82 percent from 2000 to 2020.

In the lower scenario, the government plays an active role in land use policies and surface passenger transportation, resulting in a 12 percent decrease in GHG emissions, even with significant increased individual mobility. The strategies in the low-emissions scenario are not necessarily costly, but they do require strong political will and a commitment that has yet to be demonstrated by South African leaders. South Africa is one of the few countries that does not regulate motor vehicle emissions.

Eileen Claussen, president of the Pew Center on Global Climate Change emphasizes that the objective of this series is not to prevent developing countries from growing or from enjoying the convenience of personal transportation. "Rather," she says, "the goal must be to make sure that South Africa and other countries develop transportation systems that are climate-friendly at the same time that they meet the needs of the people who use them."

PUBLICATIONS FROM ITS-DAVIS: Hot off the Presses

This Issue's Highlight

Tilt Control for Gyro-Stabilized Two Wheeled Vehicles, Karnopp, Dean, Vehicle System Dynamics, 2002, Vol. 37, No. 2, pp.145-156, ITS-Davis Pub #RP-02-09

This paper shows how a relatively simple tilt control system using a gyroscope can stabilize a two-wheeled vehicle at standstill or at speed on a low traction surface. The system as defined also can achieve a coordinated turn on a high traction surface. The gyro, as an energy storage device, also can be used in a hybrid system to provide power during acceleration or regeneration capability during braking. The paper's premise for this device is based on the belief that two-wheeled, fully enclosed motorcycles are space- and fuel-efficient vehicles that, with additional built-in stability, may become more attractive for general use.

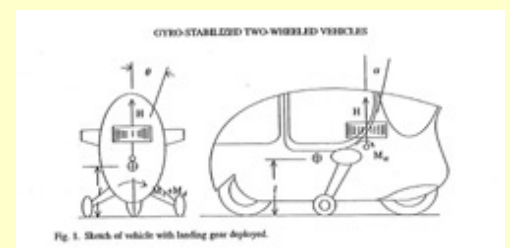


Fig. 1. Sketch of vehicle with testing gyro deployed.

Household Adaptations to New Personal Transport Options: The Reflexive Origination of Household Activity Spaces, Kurani, Kenneth S., T. Turrentine, ITS-Davis Pub #IP-02-01 (\$5)

Classification of Shared Vehicle Systems, Barth, Matthew, S. Shaheen, ITS-Davis Pub #IP-02-02 (\$5)

A Lifecycle Emissions Analysis: Urban Air Pollutants and Greenhouse-Gases from Petroleum, Natural Gas, LPG, and Other Fuels for Highway Vehicles, Forklifts, and Household Heating in the U.S., Delucchi, Mark A., World Resource Review, Vol. 13, No. 1, ITS-Davis Pub #RP-02-02

Commuter-Based Carsharing, Shaheen, Susan A., Transportation Research Record 1760, Paper No. 01-3055, ITS-Davis Pub #RP-02-03 (\$5)

Revisiting the Notion of Induced Traffic Through a Matched-Pairs Study, Mokhtarian, Patricia L., F. Samaniego, R. Shumway, N.

Transportation in Developing Countries: Greenhouse Gas Scenarios for South Africa, Prozzi, Jolanda Pretorius, Naudé, C., Sperling, D., Delucchi, M., PEW Center on Global Climate Change, February 2002, pp. 1-49. ITS-Davis Pub #RP-02-10.

Transportation in Developing Countries: An Overview of Greenhouse Gas Reduction Strategies, Sperling, Dan, Salon D., PEW Center on Global Climate Change, May 2002, pp. 1-39. ITS-Davis Pub #RP-02-11.

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One Shields Avenue, Davis, CA 95616-8762

A special welcome to ITS-Davis Event and Publications Coordinator Lauren Palmer. Contact her at 530-752-4909, or lapalmer@ucdavis.edu.

A List of Fuel Cell Vehicle Modeling Program Papers is located at http://fcv.ucdavis.edu/fcvprog/FCVMP_Publications_rev1.html

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Education Highlights



Visiting students Tim Schwanen (l) and Arno Hendriks, from the Netherlands

INTERNATIONAL VISITORS BROADEN ITS-DAVIS' HORIZONS

ITS-Davis regularly welcomes scholars from around the world. International visitors enrich the campus with their views and perspectives, and in return gain knowledge from their activities and research in this country.

Dr. Koji Sato is in the US for a one-year sabbatical from Kanagawa University at Yokohama, Japan, where he is Associate Professor of Public Policy and on the Faculty of Economics. A close colleague of Pat Mokhtarian's, Sato is comparing international differences in public policy that promotes telework, especially as it relates to information communication technology and women in the workforce. Sato is planning several road trips in his right-hand drive Toyota Prius hybrid car, which he brought with him from Japan.

Dr. Ichiro Fujimoto, with the Department of Mechanical Systems Engineering, Faculty of Engineering, Takushoku University in Japan, visited the campus for several weeks in May.

In addition, ITS-Davis has hosted two visiting students from the Netherlands this spring. Tim Schwanen is a PhD candidate from Utrecht University. Arno Hendriks received a MS in land use planning from Wageningen University. Schwanen's research covers the interactions among travel behavior, time use, socio-demographics, and the built environment. He spoke in April at an ITS lunchtime seminar on his travel behavior research in the Netherlands. Hendriks came to Davis to further his research before starting a new job with the TNO Transportation Research Institute in the city of Delft. Both Schwanen and Hendriks have been working under the supervision of Pat Mokhtarian.

ETHICS IN TRANSPORTATION POLICY: Numbers Can Lie

Students in Pat Mokhtarian's Discrete Choice Modeling class study the theory and application of travel demand models used by planners and policy makers to forecast future transportation conditions and evaluate proposed alternatives. But in a departure from their usual focus on the mechanics of building models, students were recently reminded that models are not value-free, and that political decision makers often use models as a means to a desired end.

In an important ethics component of her class, Mokhtarian invited UC Berkeley Prof. Martin Wachs, an internationally regarded expert and the author of a book titled "Ethics in Planning" to lecture on his experiences with ethics in modeling. The lecture was widely advertised to members of the ITS-Davis community, and a number of people from on- and off-campus attended.

The output of models is heavily dependent on the input assumptions, Wachs explained. He told Mokhtarian's students that he realized how important this issue was when his former students found themselves out in the real world, caught in uncomfortable political situations where they were asked to change certain inputs into a model in order to manipulate the outcome. In some cases they were forced to compromise their judgment — or lose their jobs.

Wachs told students that these are not isolated incidents; the practice is endemic to the planning world. One study of 10 rail construction projects in the US found that ridership was routinely overestimated, while costs were uniformly underestimated. The implication was that these were not just random errors to which any model would be subject, but reflective of a systematic bias.

Mokhtarian has incorporated this component into her class to prepare her students. "I don't want my students to be caught by surprise. I want them to start thinking about these issues now, and how they would respond," she explains.

Wachs is director of ITS-Berkeley, where he is also Professor of City and Regional Planning and of Civil and Environmental Engineering.

WORLD TRAVEL: Mokhtarian Travels to Sweden

Pat Mokhtarian traveled to southern Sweden last month to serve as the external "faculty opponent" at the PhD dissertation defense of Peter Arnfalk, a student at the International Institute of Industrial Environmental Economics at Lund University. The dissertation was titled, "Virtual Mobility and Pollution Prevention." It explores the potential of information communication technology applications such as teleconferencing and teleworking to reduce transportation and hence pollution.



Newly-minted PhD Peter Arnfalk (with the flowers), flanked by faculty opponent Pat Mokhtarian and advisors, Prof. Lars Hansson (l) and Prof. Thomas Lindqvist

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ITS-Davis and Campus Highlights

FREIGHTLINER DONATES TRUCK FOR RESEARCH

UC Davis researchers aren't getting much shuteye inside this Freightliner 70-inch Mid-Roof Sleeper Cab. Thanks to a donation from Freightliner LLC, ITS-Davis researcher CJ Brodrick and grad students David Grupp, Ryan Hammond and Nic Lutsey from the heavy-duty combustion team are retrofitting this big rig to be a testbed for their fuel cell auxiliary power unit (APU) work. During the coming months, the team will hook up a variety of APUs using different energy sources to



The Freightliner Sleep Car arrived in April and is now located at the Institute's Walker Hall laboratory

power various accessories in the truck. They will test the emissions from the APUs vs. emissions from idling the main truck engine, and they will measure accessory power draws. The data will be incorporated into the researchers' enhanced version of the ADVISOR vehicle model.

“This generous donation enables us to obtain empirical data to augment the little idling data currently available in the literature,” explains Brodrick. “This hands-on experience greatly enhances our program.” The ITS-Davis researchers intend for their work to improve truck drivers' rest (and hence highway safety).

COALITION FOR CLEAN AIR HONORS SPERLING

“It is humbling to receive an award of this stature, in the name of a man who I long admired,” said ITS-Davis Director Dan Sperling in his acceptance speech for the Carl Moyer Award at the annual Coalition for Clean Air awards ceremony in Los Angeles in April.

A statewide nonprofit environmental organization, the Coalition for Clean Air awards the Carl Moyer Award each year to an individual who has exhibited scientific leadership and technical excellence in the air quality field. The award is named for the scientist whose work aided the state in identifying critical health impacts of air pollution and supported groundbreaking regulatory response. Previous recipients include California Air Resources Board Chairman Alan Lloyd, California State University-Fullerton Professor of Economics Jane Hall, and Dr. Henry Gong, Chairman of the Department of Medicine, Rancho Los Amigos, and Professor of Medicine at University of Southern California.

ITS-Davis Board member Wendy James, who also serves on the board of the Coalition, presented the award to Sperling. Noting that Sperling is well recognized for his accomplishments and past efforts, James praised his focus on training the scientists of the future and his work to ensure that education is not forgotten in transportation policy development. “Without the Dan Sperlings of the future, we won't have much to applaud,” she said.

Sperling told the audience of several hundred that even though great progress has been made on the air quality front, much still needs to be done. He cited three areas in which the Institute is poised to help: global climate change, the hydrogen economy and new mobility.

He praised his students and colleagues for their commitment to research, and for his academic success. “In reality, my contributions are measured by the success of my students and by my efforts in helping them get started. And their successes are my primary rewards,” Sperling said.



Dan Sperling speaks at the Coalition for Clean Air awards luncheon. ITS-Davis board member Wendy James and Coalition Executive Director Tim Carmichael look on.

GETTING AROUND: ITS-Davis at the Fuel Cell Partnership

ITS-Davis joined industry and NGO leaders in the fuel cell arena at the California Fuel Cell Partnership's second Technology Forum in April. Over 15 people from ITS-Davis including several TTP students, students from the HEV Center and members from the Fuel Cell Vehicle



ITS's Renee Pearl staffing the booth at the CaFCP

Modeling Program, attended the event. Also in attendance were ITS-Davis Board of Advisors members Neil Otto and Ferdinand Panik.

Several of the students worked the ITS booth and answered questions about their classes and the research in advanced vehicle technologies at the Institute. They also took advantage of a terrific networking opportunity with the other OEMs, fuel and components suppliers, and government representatives attending the event.



UC Davis grads Justin Ward with Toyota, Brian Johnston with Nissan, and Anthony Eggert with Ford work at the CaFCP

Recent ITS-Davis grads working in the fuel cell industry include Anthony Eggert with Ford, Brian Johnston with Nissan, and Justin Ward with Toyota. These and the many other graduates who have gone on to work in industry and NGOs help maintain the valuable ties with the Institute.

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EXTRA! READ ALL ABOUT IT: ITS-Davis/UC Davis Faculty and Researchers Quoted in the News

Pat Mokhtarian, in *USA Today*, 5-30-02, on the ideal commute time, in an article on how solo commuting offering refuge from hectic schedules.

Dan Sperling, in the *Car Connection*, an online auto industry newsletter, 5-20-02, on a bill pending in California that would require automakers to reduce automobile greenhouse gas emissions.

Dan Sperling, on *Voice of America*, 5-18-02, on the Pew-funded research on greenhouse gas reduction strategies in developing countries.

Dan Sperling, in *South China Morning Post*, 5-17-02, in an article stemming from the Pew –funded research on greenhouse gas reduction strategies in developing countries.

Pat Mokhtarian, in an *Associated Press* article, 5-15-02, on the increase in time spent commuting to work, part of a story on growth in California citing the recent census release.

ITS-Davis research on induced demand, led by Patricia Mokhtarian, was cited in an article in the *Los Angeles Times*, 4-10-02.

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