



*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](#).

This special issue is devoted to news and activities involving hydrogen and fuel cell research.

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Special Hydrogen and Fuel Cell Update, April 2004

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### IT'S OFFICIAL: HYDROGEN HIGHWAY NETWORK LAUNCHED

#### UC Davis Hosts California Governor's Announcement, Signing of Executive Order



The governor gives thumbs-up to his fueling experience

After months of media buzz, California Gov. Arnold Schwarzenegger launched his long-anticipated Hydrogen Highway Network in an event at UC Davis — his first visit to a UC campus — on April 20.

Hundreds of industry, government, academic and NGO representatives watched the governor arrive in one of UC Davis's two Toyota FCHV fuel cell vehicles, step out of the car, and begin refueling from the university's new hydrogen fueling station. The first member of the general public to use the hydrogen station, Schwarzenegger flashed the thumbs-up sign and smiled at a wall of television cameras and still photographers, who captured the image and distributed it around the world.

"What you see here today is the future of California," Schwarzenegger said. "This starts a new era for clean California transportation."

Flanked by state officials and UC Davis Chancellor Larry Vanderhoef, the governor signed an executive order to create a statewide hydrogen transportation network by 2010. UC Davis's station is the first publicly accessible station in the network.

The governor chose to formally announce the program at UC Davis because it is home of the world's largest university research and teaching program on clean transportation, the Institute of Transportation Studies.

"UC Davis is the pre-eminent university in hydrogen-fuel research and teaching," said Vanderhoef. "Just as California's university-based innovators and visionaries launched the global computer and biotechnology revolutions, UC Davis is helping California launch the clean-transportation revolution."

More than 40 faculty members, 15 research staff and 80 graduate students are affiliated with ITS-Davis.

"None of us knows what the future of transportation will be. But we do know change is needed," said ITS-Davis Director Dan Sperling. "We should take steps now to address the long-term challenges in transportation and energy. Intelligent demonstrations, strong research and public education are imperative if California will continue to lead in efforts to clean our air and reduce greenhouse gases that are warming the planet.



Signing the Hydrogen Highways Executive Order

"At UC Davis we have a rich history of programs supported by industry and the state that we will build on," concluded Sperling.



Gov. Arnold Schwarzenegger and Chancellor Larry Vanderhoef

Institute researchers are expected to lend technical support to the research effort launched as a result of the executive order. The order calls on the state to identify strategies for accelerating hydrogen use through mechanisms such as incentives, bonds, procurement agreements, and public-private partnerships. It urges state negotiation with industry to speed the introduction of efficient and cost-effective hydrogen-powered cars, and encourages state agencies to purchase an increasing number of clean, hydrogen-powered vehicles when they become available. The executive order also calls for the creation of safety standards, building codes, and emergency response procedures for hydrogen fueling installations.

The university's new hydrogen station, which was built with funds provided by the Federal Transit Administration and Toyota, fueled more than the governor's car. Two Honda fuel cell cars participating in a demonstration

project of the city and county of San Francisco drove to the event from San Francisco and refueled in Davis for their return trip.

"We have an opportunity to prove to the world that a thriving environment and economy can co-exist," the governor added. "This vision for California is real and attainable; however, it will take time so we must plant the seeds now," Schwarzenegger said.

Throng of TV cameras and reporters from all the major media outlets covered the event, bringing significant attention to UC Davis's fuel cell and hydrogen research programs. Among them were: *San Francisco Chronicle*, *The Sacramento Bee*, AP, Reuters, *The Davis Enterprise*, *Woodland Daily Democrat*, *California Aggie*, *The Australian*, and numerous local TV and radio stations.



Gov. Schwarzenegger and Dan Sperling after the formal announcement

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## FUELING THE FUTURE: UC Davis's Role in a Hydrogen Economy

Following the governor's Hydrogen Highway announcement at UC Davis, Chancellor Larry Vanderhoef, Vice Chancellor Barry Klein, Provost Virginia Hinshaw, and Engineering Dean Enrique Lavernia, along with ITS-Davis Director Dan Sperling and others convened an Executive Forum to solicit input on the ideal contribution that UC Davis should make to California's movement toward hydrogen infrastructure and vehicles, and clean vehicles. Approximately 30 high-level industry, government and environmental group representatives attended.

"We need to understand how the University can provide the greatest benefit through its core programs of research, education and outreach," Sperling said, adding that the forum provided the perfect opportunity to bring together high-level industry and governmental experts who were already on campus for the governor's announcement.

## DOE H2 and FCV GRANTS: UC Davis Central to Partnerships for Research, Outreach and Demonstration

UC Davis has just learned that it will participate in multiple separate hydrogen research and demonstration projects funded by the U.S. Department of Energy. Energy Secretary Spencer Abraham announced the winners of President Bush's Hydrogen Research Initiative this week. Thirty lead organizations and more than 100 partners are participating in the \$350 million program.

ITS-Davis is included in three of the four major programs announced: Hydrogen Grand Challenge; Controlled Hydrogen Demonstration; and Fuel Cell Research. Within the Controlled Hydrogen Demonstration, the institute is a partner in four of the five grants that were awarded.

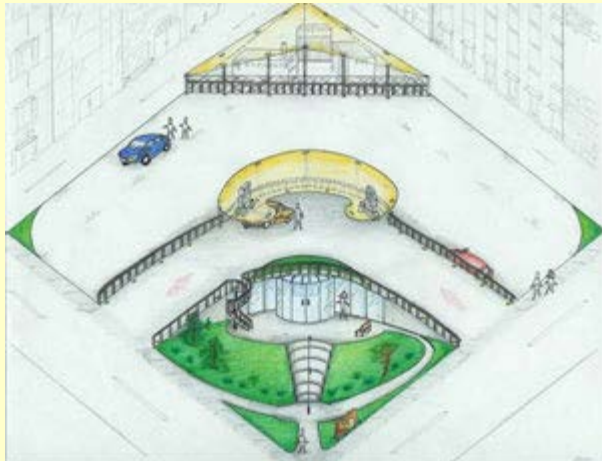
UC Davis will partner with energy suppliers and automotive companies to provide its unique expertise in four areas:

- Education and outreach
- Hydrogen production from an advanced energy station
- Fleet operation and demonstration
- Research on infrastructure cost and lifecycle modeling

One project includes a state-of-the-art energy station and hydrogen fueling island to be constructed on campus by ChevronTexaco. The major ITS-Davis partners include: ChevronTexaco, Air Products and Chemicals, BP, Toyota, Hyundai and Ford. The City of Davis will also host vehicles in the demonstration program with Ford.

The \$350 million represents nearly one-third of the president's \$1.2 billion commitment in research funding announced during his 2003 State of the Union address.

## HIGH PROFILE: Hydrogen Pathways Researchers Active at NHA Conference



UC Davis Team Eno's entry is a three-level station designed to maximize the safety and aesthetics of the fueling experience.

A large contingent of researchers from the Hydrogen Pathways research program is attending the National Hydrogen Association conference in Hollywood, Calif. through April 30.

Eight Hydrogen Pathways researchers are presenting papers at the conference. In addition, a team of UC Davis students finished second by the narrowest of margins this week in the first annual Hydrogen Fueling Station Design Contest sponsored by the U.S. Department of Energy.

The contest requires interdisciplinary teams of students to develop the technical design; conduct necessary safety, economic, and environmental analyses; and outline a marketing and education campaign to raise public support for hydrogen as a vehicle fuel. Fifteen teams from universities around North America competed in this landmark event.

ITS-Davis Team Captain Jonathan Weinert says the contest was a terrific learning experience.

"This competition was, by far, the most rewarding experience of my graduate career. We learned so much about hydrogen technology, the hydrogen industry, and project management," he said.

He also praised his teammates. "We had excellent students from a diverse set of backgrounds all who contributed their considerable talents toward the final report." ITS-Davis students Matt Caldwell, Rusty Heffner, and Ryan McCarthy, plus five other UC Davis students, joined Weinert on the team.

To learn more about the team and its Eno Fueling Center:

<http://www.fuelcelltrek.com/EnoHydrogen.htm>

The following papers are being presented at NHA:

Bouwkamp, Nico, "**Understanding Transitions and Lessons Learned**"

Miller, Marshall, "**Evaluation of Hydrogen Enriched Natural Gas Transit Bus Technology at the University of California, Davis**"

Nicolas, Michael, "**Siting and Network Evaluation Methods for Hydrogen Stations Using Geographical Information Systems**"

Ogden, Joan, "**Hydrogen Delivery**"

Sperling, Daniel, "**Is Hydrogen Different?**"

Weinert, Jonathan, "**The LAX Hydrogen Fueling Station Development: A Historical, Technical, and Economic Overview with a Discussion of Obstacles**"

Williams, Brett, "**Innovative Drivers for Hydrogen-Fuel-Cell-Vehicle Commercialization: Establishing Vehicle-to-Grid Markets**"

Yang, Christopher, "**Defining Low-Cost Hydrogen Pathway Strategies to Meet an Evolving Hydrogen Demand**"

## HYDROGEN PATHWAYS PROGRAM GROWING: GM, NRCAN and Subaru are Newest Members

ITS-Davis's Hydrogen Pathways research program announces its newest member, General Motors, bringing to 16 the total number of contributing industry partners. Current members now include: Air Products, BP, ChevronTexaco, ConocoPhillips, ExxonMobil, GM, Honda, Hyundai, NRCAN, Nissan, Shell, Subaru, TOTAL, Toyota, U.S. DOE, and U.S. DOT. For more information on the program, see

<http://www.its.ucdavis.edu/Hydrogen/>

## HYDROGEN LEARNING CENTER: UC Davis Shares Grant Award

UC Davis is collaborating with other universities and agencies on an 18-month project to develop hydrogen technology learning centers for

California, Florida, and New York. Under the project, funded by the U.S. DOE through the State Technologies Advancement Collaborative, participants will develop interactive displays and exhibits, set up a website, produce information publications, and conduct a national conference. In addition to UC Davis, participants include: University of Central Florida-Florida Solar Energy Center, San Diego Miramar College, Rochester Institute of Technology, New York State Energy Research and Development Authority (NYSERDA), and the California Energy Commission.

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