



[Traffic Safety Center Builds on Its First Five Years:](#)

Bridging research and practice, helping train new professionals and advising California agencies on key new federal safety requirements.

[Welcome New Students:](#) A diverse group of incoming transportation students began classes last month following a day-long orientation. New ITS students come from as far away as Seoul, Korea and as close as San Mateo.

[First Wachs Lecture—Flybjerg on Megaprojects:](#) Pop quiz. Which of the following five megaprojects DID NOT run over budget and DID NOT result in fewer benefits than forecast? China's Three Gorges Dam, Iraq reconstruction, The EuroTunnel, the Space Shuttle, or Bilbao's Guggenheim Museum.

[ITS Affiliates Program:](#) ITS recently initiated a program that allows transportation firms and individuals to enjoy enhanced access to the institute's resources in exchange for a tax-deductible donation to support ITS activities. ITS welcomes **The Transpo Group, Inc.**, of Kirkland, Washington to the

News Briefs



PATH @ Twenty: Symposium and dinner mark the anniversary, October 26-27. [More...](#)



ITS Named Transportation Organization of the Year: Honor Given to Multi-Campus Unit at California Transportation Foundation Yearly Awards Banquet. [More...](#)

"Making Urban Transport Sustainable: Notes from 4 1/2 Years on the Street in Developing Cities in Asia and Latin America:" Lee Schipper, Director of Research, The World Resources Institute's Center for Sustainable Transport, presents a lecture as part of the new **Global Metropolitan Studies Program.** [More...](#)



1st Annual Park(ing) Day at UCB: Better uses for a parking space tested out by UCTC/ITS and undergrad transportation planning students at a September 21 event. [More...](#)

Danish Parliamentary Delegation Visits ITS: Members of the Danish Parliament's transportation committee visited ITS last month to learn more about the Institute's current traffic safety research. Committee members and the Danish Minister of Transport spent a day touring the new PATH traffic research facilities and the Pavement Research Lab at the Richmond Field Station.

program.

NewsBITS, the magazine of the [Berkeley Institute of Transportation Studies](#), is published four times a year by the Berkeley ITS Publications Office. Your comments are welcome. Address them to the editors listed below.

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Two Recent Ph.D.'s, Soyoung Ahn (Engineering) and Aaron Golub (Planning) Join Faculty at Arizona State: An unusually large share of alumni of UC Berkeley's graduate transportation programs have found careers in academia. [See the entire list of alumni in academia...](#)

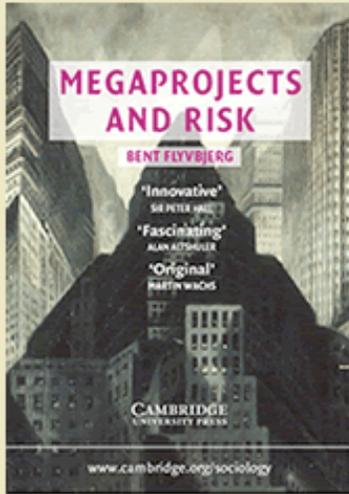
Recent Awards

[Karl Hedrick Wins American Society of Mechanical Engineers 2006 Rufus Oldenburger Medal.](#)

[Samer Madanat Awarded Xenel Distinguished Professorship in Engineering.](#)

[Pravin Varaiya Awarded the Berkeley Citation.](#)

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First Annual Wachs Lecture—Flyvbjerg on Megaprojects

Why the worst ones get built, and how planners can stop them.

Pop quiz. Which of the following five megaprojects DID NOT run over budget and DID NOT result in fewer benefits than forecast?

China's Three Gorges Dam, Iraq reconstruction, The EuroTunnel, the Space Shuttle, or Bilbao's Guggenheim Museum.

If you guessed the Guggenheim Museum, you probably attended the inaugural lecture of the first annual **Martin Wachs Distinguished Lecture** in Transportation on October 17 where **Bent Flyvbjerg**, Professor of Planning at Aalborg University, Denmark, and former Wachs Ph.D. student, told a packed auditorium of current and future transportation, urban and regional

planners the bad news about megaprojects.

"Nine out of 10 megaprojects have substantial cost overruns and benefit shortfalls," he said.

"Boston's Big Dig, for example, is already 224 percent over cost. The tunnel is leaking, and a panel fell and killed a user."

Cost overruns and benefit shortfalls have plagued large projects for decades, not only in the U.S. but virtually everywhere else as well. Copenhagen's new metro system is already 157 percent over budget and still growing, while the EuroTunnel under the English Channel ended up costing twice as much—and providing only half the benefits—as originally forecast. "The British economy would have been better if the tunnel had never been constructed," said Flyvbjerg. (The Frank Gehry-designed Guggenheim Museum in Bilbao, on the other hand, was built on budget, on time, and has turned into a cash cow for the city.)

Flyvbjerg quoted his former adviser and mentor, Wachs, who, in 1986 said "forecasted patronage is always apparently higher than actual patronage, while forecasted costs always seem to be lower than actual costs." What's changed, however, and made this situation worse, is the increasing size and scope of transportation and building projects. Now, reports Flyvbjerg, accompanying cost overruns threaten to swamp economies. For example, construction costs for the Olympic Games in Athens were so over budget that the country's credit rating tumbled.

Another word for "lying"

The causes are three-fold, Flyvbjerg told the audience, but the most pernicious is "the problem of strategic misrepresentation," a term he said he came up with when audiences were uncomfortable with the word he originally used—"lying."

Political and organizational pressures conspire to produce dishonest budgets for projects. "Planners know the budget is too low, but it's difficult to tell the politicians," Flyvbjerg said. They know that high costs reduce the chance of procuring funding. Likewise, they over-promote the benefits of a project as part of the competitive process. Competing against other projects for limited resources leads to "strategic misrepresentation."

Unfortunately, this culture of misrepresentation is "very hard to topple," he said, yet it leads to the worst projects getting built—a result he calls "inverted Darwinism," or survival of the unfittest, the title of his talk. A general rule of thumb, he said, is "the better a project looks on paper, the worse it is."

Wachs Distinguished Lecture: for more information on how to contribute to the lecture fund, click [here](#).

[Bent Flyvbjerg's Web site](#).

[Excerpt from Megaprojects and Risk](#).

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When asked how to combat the problem, he prescribed three things: "Accountability, accountability, accountability." This means asking promoters or developers to come up with a percent of the capital required for the project, as well as paying for cost overruns that previously have been passed on to taxpayers.

What might lead to reforms

On an optimistic note, he suggested that reforms will be made as large cost overruns threaten economies. Public-private partnerships are also gaining traction as a way to finance large projects and may prove to be better at providing realistic budget and benefit forecasts.

The lecture, which was organized by Wachs' current and former students to honor his contributions to education and research in transportation planning, policy and finance, was sponsored by a number of campus organizations including the University of California Transportation Center and Institute of Transportation Studies, where Wachs served as director. Next year, it will be hosted at UCLA, where Wachs was on the faculty before coming to Berkeley.

In his remarks to the audience, Wachs, who retired from academia but works at the RAND Corporation in Santa Monica, said he could imagine no greater tribute than to bring Flyvbjerg to Berkeley to speak at this first annual lecture.



Traffic Safety Center Builds on Its First Five Years

Bridging research and practice to advise agencies and train new professionals, it makes a major contribution to California's federal safety program participation.

When President Bush signed **SAFETEA-LU**, the new federal transportation funding bill, into law last year, it set in motion a top-to-bottom mechanism for states to prioritize **road safety improvements**. It places a number of new requirements on state transportation agencies in order for them to qualify for funds.

On September 26, 2006, less than a year after the federal bill was signed, the California Secretary of Business, Transportation and Housing approved a key document that will enable the state to take part in this new program. It is the

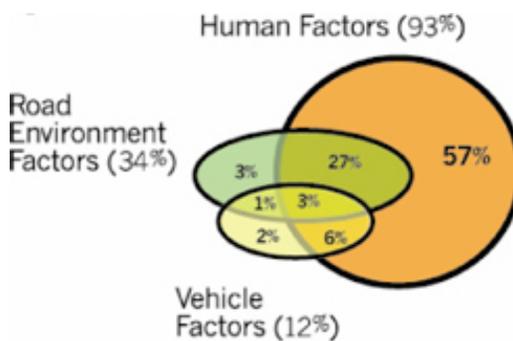
California Strategic Highway Safety Plan, and the UC Berkeley Traffic Safety Center is a member of the advisory board that helped to develop it.

"This is a statewide, integrated, collaborative approach to improving safety on California's roadways," explained **David Ragland**, Director of the Traffic Safety Center and an active participant in advising the **California Department of Transportation (Caltrans)** on how to evaluate safety needs and devise policies and programs to address them in order to comply with the federal law. Traffic Safety Center projects have covered a broad spectrum of topics over the years, ranging from collisions involving alcohol, intersection collision prevention, pedestrian and bicycle safety, child passenger safety, and traffic safety in rural areas.

As required by SAFETEA-LU, states must first devise a plan. The second part of the two-step effort is the development of a **State Highway Safety Improvement Program**. Meeting the federal requirements will make the state eligible for its full share of funds. The plan must be completed by October 1, 2007 in order for the state to qualify.

A Holistic, Proactive Approach

Ragland said that this kind of collaborative, "big-picture" work was necessary to tackle safety issues successfully.



Crashes result from three factors, singly or in different combinations: the **vehicle**, the **driver (human factors)** and the **road environment** (which can include weather as well as pavement, signs, lighting and the like). For example, a collision may result from faulty brakes, an impaired driver, or a curve that is too tight for the prevailing speed. As the diagram (based on national data) shows, human factors are involved in nearly all crashes, some 93 percent, but a closer look shows the interlocking nature of the three elements involved when a crash occurs. Road environment factors are an element more than one-third of the time, and vehicle factors are important in just over one crash in 10. When the other factors are filtered out, human factors are the sole reason for 57 percent of traffic crashes, the road environment is

[The California Strategic Highway Safety Plan](#) that the TSC and a team of stakeholders developed is approved by the Sunne Wright McPeak, California Secretary of Business, Transportation and Housing on September 26, 2006.

[SAFETEA-LU \(Safe, Accountable, Flexible, Efficient Transportation Equity Act\)](#) provision for states (short summary) 20 pp. PDF.

[Putting Safety into Road Planning—a New Diagnostic Approach](#): *Visitors from the Colorado DOT discuss their system to address safety in roadway design—a Traffic Safety Seminar presentation.* (Article from TSC Newsletter, Summer 2006.)

[When Crosswalks Work—and When They Don't](#): *Charles Zegeer discusses his study on marked vs. unmarked crossings.* (Article from TSC Newsletter, Summer 2006.)

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responsible for 3 percent, and vehicle factors for 2 percent. These figures support the importance of a holistic approach to roadway safety.

At approximately the same time that the initial Strategic Highway Safety Plan was approved, Caltrans delivered to the Federal Highway Administration (FHWA) **The 2006 California Highway Safety Improvement Program 5 Percent Report**, another key requirement under the federal law. The Traffic Safety Center made significant contributions to developing this document, too. As stipulated in the enabling legislation, the document, which every state must prepare, describes the 5 percent of public roadways in the state "exhibiting the most severe safety needs" in satisfaction of FHWA requirements under the new law.

In addition to Caltrans and the TSC, participants included:

- California Highway Patrol (CHP)
- California Department of Motor Vehicles (DMV)
- Federal Highway Administration (FHWA)
- Mothers Against Drunk Driving (MADD)
- California State Association of Counties (CSAC)
- County Engineers Association of California (CEAC)
- League of California Cities
- California Department of Health Services (DHS)

This latest round of activity is in keeping with one of the TSC's priorities, which is to bridge the gap between research and practice by participating in and advising task forces. It also provides technical advice to state and local agencies and non-governmental organizations, ranging in size and scope from Caltrans to the small East Bay city of Emeryville, or community groups, such as community activists in Oakland's Chinatown or the farmworker communities of the Central Valley.

"These recent contributions reflect the center's unique capacity to advance traffic safety theory and practice because of its core competencies," Ragland noted. They are threefold, he explained:

- Teaching: training students for future roles in promoting and spreading understanding of traffic safety,
- Applied research: applying findings from the center's academic research to real-world solutions to real-world problems, and
- Technical support for California transportation agencies and non-governmental groups, as well as service on task forces and advisory groups.

Traffic Safety Center faculty teach two graduate courses, one offered through the School of Public Health, and the other through Civil and Environmental Engineering, and jointly sponsored by both. They are: "Public Health Injury Prevention and Control," which explores statistical and policy analysis of public health and injury prevention, and "Traffic Safety and Injury Prevention," which integrates engineering, behavioral science, and vision science into a comprehensive approach to traffic safety.

In addition, the TSC hosts the Traffic Safety Seminar, which is open to the University community and the general public featuring both University and outside experts in traffic safety.

In the 2005-2006 academic year, the Traffic Safety Center hosted on separate occasions pedestrian safety expert **Charles V. Zegeer**, and two leaders in safety assessment methods for road designs, **Jake Kononov** and **Bryan Allery**.

Zegeer is Associate Director of the **University of North Carolina's Highway Safety Research Center** and director of the **Pedestrian and Bicycle Information Center**. He has written numerous reports, including the Federal Highway Administration's *Pedestrian Facility User's Guide* and the 2004 edition of its *Annual Review of Pedestrian Safety Research*.

Zegeer's lecture was closely modeled on a September 2005 report he prepared for the Federal Highway Administration (FHWA), **"Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations."** This is a well-documented contribution to much-debated topic of the appropriate use of crosswalks, and how much safety they truly provide.

The study analyzed five years worth of data about pedestrian crashes at 1,000 marked crosswalks and 1,000 matched unmarked sites in comparable locations. All of them were "**uncontrolled**," meaning there was no signal or stop sign regulating traffic.

Key results from the study were as follows:

- on two-lane roads, marked crosswalks alone were no safer than unmarked crosswalks;
- on low-volume multi-lane roads, marked and unmarked crosswalks provided the same amount of protection;
- on multi-lane roads with high traffic volumes (upwards of 12,00 vehicles per day), a marked crosswalk by itself, without other safety enhancements, was associated with greater pedestrian danger;
- the presence of a raised median provided significantly greater protection on multi-lane roads compared to no median;
- as traffic volume rose, crash rates went up for marked and unmarked crosswalks, but they rose much more steeply for marked crosswalks when rates are above 10,000 vehicles a day.

Zegeer emphasized that the important finding was not that marked crosswalks should not be used, but that they should be used appropriately. ([Read more in the TSC Newsletter.](#))

Kononov and Allery are engineers with the **Colorado Department of Transportation** (CDOT), who have written and spoken extensively on methods that they have devised and deployed to better measure roadway safety that are more transparent and easier to implement.

Roadway designs' effectiveness in moving traffic is traditionally measured by the **Level of Service (LOS)**, which rates speed and ease of travel, volume of traffic that can be accommodated and other indicators of roads' convenience and efficiency for users. However, LOS is not connected to a roadway's safety.

The 1998 federal highway bill, the Transportation Equity Act for the 21st Century, TEA-21, required that safety be explicitly considered in the planning process (similar to the way that environmental impacts must be considered). However, much remains to be understood about the best way to measure safety and how to decide where money for safety improvements would be best spent.

In order to address this issue, the Colorado Department of Transportation has devised a system that expands the LOS ranking to include safety. They call it **Level of Service of Safety (LOSS)**. ([Read more in TSC Newsletter.](#))
