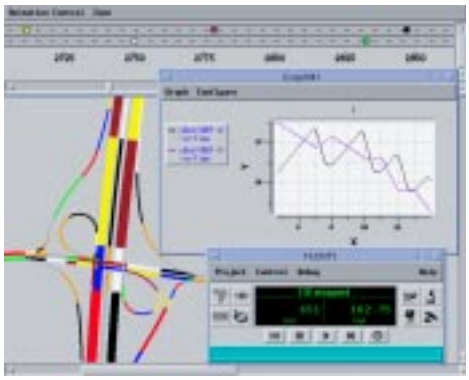
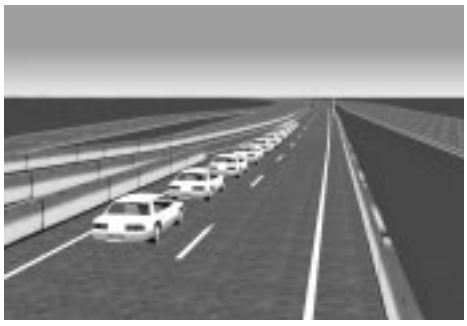
PATH Program–University of California, Berkeley

The California Partners for Advanced Transit and Highways (PATH) Program is a collaboration between the University of California and the California Department of Transportation (Caltrans), together with other public and private institutions and private industry, with the mission of applying advanced technology to improve highway capacity and safety, and to reduce traffic congestion, air pollution, and energy consumption.

PATH research emphasizes areas that offer potentially dramatic improvements in the operation of the transportation system, rather than areas where only incremental improvements can be made. The growth of population and travel demand is so rapid in California that the effects of incremental solutions are likely to be absorbed by this growth by the time that they are implemented. PATH addresses relatively long-term, high-impact solutions, together with the progressive steps necessary to bring those long-term solutions to pass.

The first program of research on intelligent transportation systems (ITS) in the United States, PATH was established in 1986 by agreement between Caltrans and the University of California's Institute of Transportation Studies. PATH's founders actively encouraged the formation of other ITS programs throughout the United States, leading eventually to the involvement of the federal Department of Transportation in 1992. PATH has about forty full-time research and support staff people at its headquarters and testing facility in Richmond, California, five miles north of Berkeley. However, many of the research projects are conducted by forty professors and about eighty graduate students at both UC Berkeley and other universities throughout the state.





Above right: 8-car platoon of PATH test cars on Interstate 15 at Demo '97 in San Diego. Above (clockwise from left): binocular machine vision for obstacle detection, SmartAHS microsimulation of automated highway, animated simulation of I-15 demonstration, video image processing for traffic surveillance

The core of the PATH Program is its research projects funded by the Caltrans New Technology and Research Program. There are about eighty current projects, selected on the basis of an annual request for proposals, from proposals that are submitted from throughout California. These eighty research projects are subdivided into three broad categories:

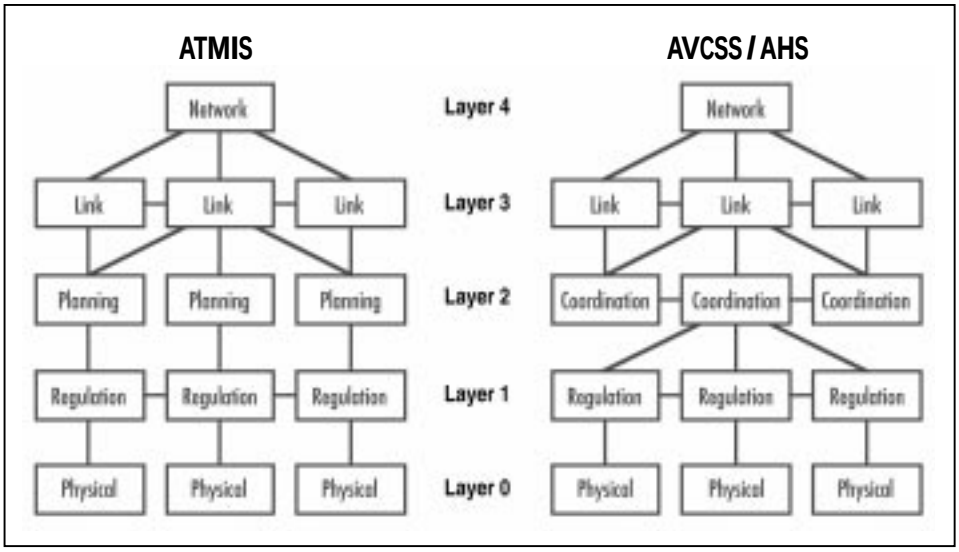
- ATMIS–Advanced Transportation Management Information Systems (which includes the traditional categories of Advanced Traffic Management, Advanced Traveler Information, and Advanced Public Transportation Systems)
- AVCSS–Advanced Vehicle Control and Safety Systems (which includes Automated Highway Systems–AHS)
- Systems–the cross-cutting and institutional issues that apply to both ATMIS and AVCSS, as well as communications and system architecture.

PATH has participated actively in the national program of ITS research in the United States, in projects funded by the US Department of Transportation:

- National ITS Architecture Program–subcontractor to the Rockwell team, focusing on evaluation of transportation impacts of ITS
- Human Factors Design of Automated Highway Systems–subcontractor to Honeywell, defining AHS operational scenarios
- Evaluations of California ITS Operational Tests:
  - TravInfo (San Francisco Bay Area traveler information)
  - Smart Call Box (San Diego)
  - Adaptive Traffic Control (Anaheim)
  - Integrated Ramp/Signal Control (Irvine)
  - Mobile Surveillance (Orange County)
  - Wireless Spread Spectrum Communication (Los Angeles)
  - TransCal (Bay Area to Reno, NV)
  - SmartCard (Ventura)
- National Automated Highway Systems Consortium (NAHSC) – one of ten core participants in this major program, with lead responsibility for developing AHS modeling and analysis tools and for the platoon demonstration scenario, as well as substantial participation in evaluation and selection of AHS operational concepts and enabling technologies.

PATH also cultivates working relationships with other research institutes and private industry. PATH uses experimental vehicles provided by:

- General Motors
- Ford
- Honda
- Chrysler
- Freightliner (Class 8 tractor/trailer).



PATH has an active research exchange program with INRETS in France and has conducted research projects in cooperation with or sponsored by:

- AHSRA
- BMW
- Daimler-Benz
- Honda
- IMRA America (Aisin Seiki)
- US Office of Naval Research
- TNO/TPD (Combi-Road)
- TRW.

PATH researchers are eager to work with other leading researchers throughout the world, in both the public and private sectors, on projects that extend the boundaries of knowledge and technology in ITS topics such as:

- Advanced traffic operations
- Traffic surveillance
- Transportation system modeling
- Vehicle control systems
- Automated highway systems
- Driver warning and control assistance systems
- System safety evaluations
- System performance assessment
- Institutional issues.

Above, top to bottom: PATH hierarchical architectures for ATMIS and AVCSS;
PATH ATMIS Testbed at University of California, Irvine; Caltrans Transportation Management Center, Orange County, California

CALIFORNIA PATH

California Partners for Advanced Transit and Highways

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