Commemorating the 20th Anniversary of the National Automated Highway Systems Consortium Demo ‘97 in San Diego

Richard Bishop, Kevin Dopart and Steven Shladover
Section 6054(b) of Intermodal Surface Transportation Efficiency Act of 1991:

“The Secretary shall develop an automated highway and vehicle prototype from which future fully automated intelligent vehicle-highway systems can be developed. Such development shall include research in human factors to ensure the success of the man-machine relationship. The goal of this program is to have the first fully automated roadway or an automated test track in operation by 1997.”
National Automated Highway Systems Consortium (NAHSC)

Team formed to compete for FHWA cooperative agreement to deliver the AHS program ($200 M from 1994-2002, with 20% cost share)

- General Motors
- Delphi Automotive (Delco Electronics)
- Hughes Aircraft
- Lockheed-Martin
- Bechtel
- Parsons-Brinckerhoff
- Carnegie-Mellon University
- University of California PATH Program
- California Department of Transportation
Post-Demo Roadmap Toward Deployment
Demo ‘97 Sites in San Diego

• On I-15 HOV lanes in San Diego and adjacent Miramar College campus (exhibits and mini-demos)
• August 7-10, 1997
Demo Scenarios

• NAHSC Core Team Demos:
  – Free Agent Multi-Platform Demo (CMU, GM, Delphi, Hughes, Houston Metro) – 2 buses + 2 cars
  – Platooning Demo (PATH, GM, Delphi, Hughes) – 8 cars

• Associate Demos:
  – Toyota – 2 cars
  – Honda – 2 cars
  – Ohio State University – 2 cars
  – Eaton-Vorad – 1 truck (warning) + target car
  – Caltrans/U.C. Davis AHMCT – 2 maintenance vehicles
Free Agent, Multi-Platform Scenario
Platooning Scenario
Control Transition Scenario (Honda)
Evolutionary Scenario (Toyota)
Alternative Technology Scenario
(Ohio State University)

THE STRIKE
The strike of objects, designed at Ohio State and manufactured by DL, made their way onto the highway, but is a crucial component of automated technology. Special radar sensors and radar sensors on-board the vehicle are the eyes to see the cars through clear vision, such as when the car is in the blind spot of the lane, changing lanes in panic, or when entering the corner of the lane. Another challenge is the impact of the roadway profile. These sensors are used to adjust the width of the lanes or the edges of the lanes.

THE VISION
The vision system on the Ohio State vehicles provides a function to the road traffic system technology. In case one vehicle is not following the rules, the vehicle’s blind side radar and laser scanner determine the presence of other vehicles. This fusion of technology — radar, vision and laser — helps accommodate a variety of traffic situations that include autonomous and non-autonomous vehicles, and provides extra control for increased safety.

THE BRAINS
When it comes to the term “a car”, in the book, it means something off the roads, providing information to the corporation which applies depending on the car type.

THE STATUS
Status displays received in the headrest and on the center of the instrument panel are not part of the current highway system equipment. The automated technologies are virtually transparent on the Ohio State car. The status displays were intended to keep passengers informed of what is happening at any given moment. By watching the display, they can see whether the car is in a manual or automatic control, which engine is operating, and what the car “thinks” about adjacent vehicles.

THE SCENARIO
In the “Real” scenario of demonstration, Ohio State is demonstrating the use of other vehicle steering technology in a test situation involving three vehicles — two special and one conventional Honda vehicles.
- Car A is normal and drives at exactly at right throughout, simulating a slow-moving non-automated vehicle.
- Car B is automated and is driven at a steady 65 mph.
- There is a car C, 65 mph, changing lanes to the left side of the road.
- Car A and car B are automated.
- Car B changes lane at 65 mph, enters lane at 65 mph, enters lane at 65 mph, enters lane at 65 mph.
- Car A then changes lane at 65 mph.
Eaton-VORAD Warning Demo
Caltrans/UC Davis AHMCT Program
Highway Maintenance Demo
VIP Visitors and Media Attention
Demo ‘97 Statistics

• 21 vehicles drove over 8,000 automated miles

• Visitors:
  – Exhibit - 3500
  – Mini-Demo riders: 3100
  – On–road demo riders - 2850

• Media coverage:
  – ABC, CBS, NBC, CNN, MSNBC, PBS television coverage
  – NPR All Things Considered
  – International coverage in 12 countries on 5 continents
  – Total of 120 media outlets represented
Celebration at the End