



AHS Update

A NEWSLETTER FOR THE NATIONAL AUTOMATED HIGHWAY SYSTEM CONSORTIUM

NOVEMBER 1994 VOL. 1 - NO. 1

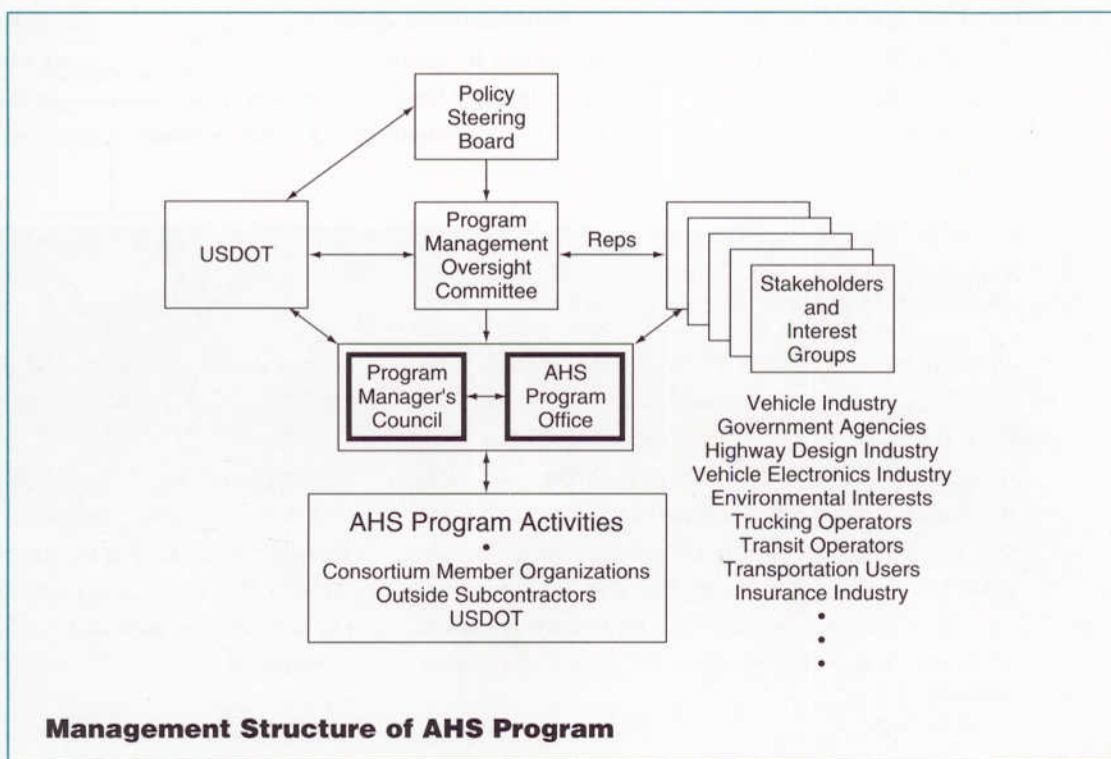
NAHSC Core Participants

- **Bechtel Corporation**
(Transportation Design and Construction Representative)
- **The California Department of Transportation**
(State/regional/metropolitan transportation agencies representative)
- **Carnegie-Mellon University Robotics Institute**
(Center for application of intelligence to vehicle sensing and control, and computer architecture for machine intelligence)
- **Delco Electronics**
(Vehicle electronics industry representative)
- **General Motors**
(Vehicle industry representative)
- **Hughes Aircraft**
(Aerospace systems industry representative)
- **Martin Marietta**
(Aerospace/electronics systems industry representative)
- **Parsons Brinckerhoff/Farradyne Systems Inc.**
(Transportation Infrastructure and Systems Engineering Representative)
- **The University of California Partners for Advanced Transit and Highways (PATH) Program**
(Leading AHS research group in the U.S.)

The Birth of the NAHSC

The National Automated Highway System Consortium (NAHSC) is a collaboration that includes the world's largest automotive, vehicle electronics, aerospace and transportation infrastructure development firms; the transportation authority of the nation's most populous state, and two leading U.S. universities. It was formed in response to a U.S. Department of Transportation (USDOT) Request for Applications to conduct systems design feasibility, definition and prototyping of a safe, reliable, cost-effective automated highway system (AHS) capable of substantially improving vehicle throughput along high-demand urban and rural traffic corridors. The NAHSC has been awarded the cooperative agreement by the USDOT to pursue the design and development of the AHS.

The NAHSC, in partnership with the USDOT and other stakeholders, will carry out the Systems Definition Phase of what ultimately will be deployed as the next major performance upgrade of the nation's vehicle-highway system. This is a major undertaking that will ultimately affect a wide range of interests. For this reason, the consortium believes these interests must play a significant role in the consensus building, analysis and decision-making that will take place throughout the life of the AHS program. To achieve this, the NAHSC is organized to balance the needs of planning, managing and executing a challenging technical project with the need to involve the broadest possible range of stakeholders and interested parties. The structure of the consortium is shown in the figure below. ■



Management Structure of AHS Program

Consortium Participation

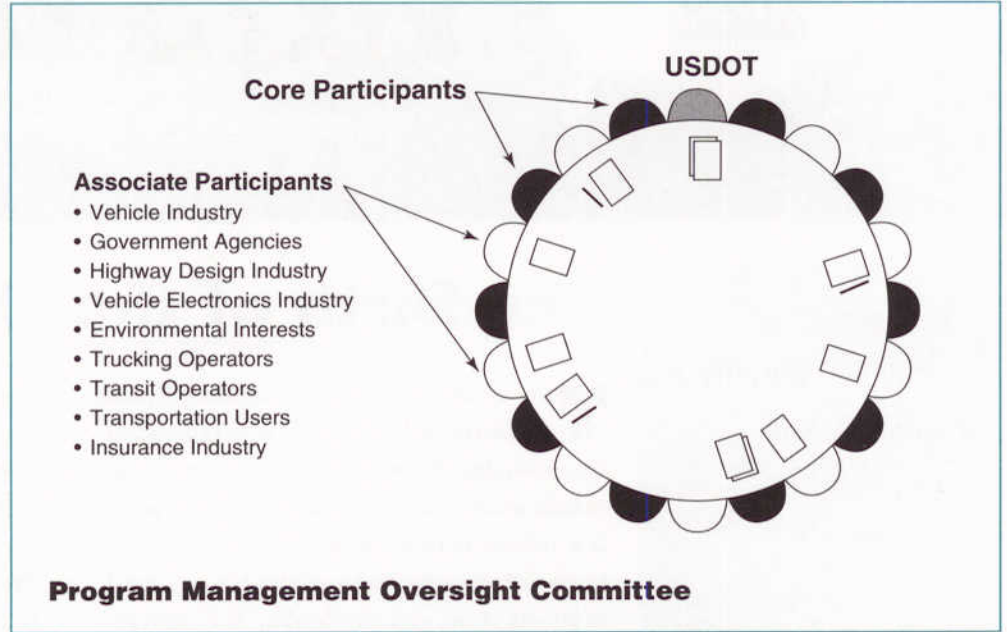
In forming the NAHSC, the objective was to attain a balance between the efficiency of planning and execution possible with a small, highly effective team, and the robustness, diverse viewpoints and broad buy-in possible with a larger team. To meet this challenge, the consortium has two categories of participation: core membership and associate membership.

Core Participants

The core participants (listed on page 1) contribute at least 20% of the total project budget, supply key staff for the project and are ineligible for profit and fees on their work. They all have representatives on the Policy Steering Board and the Program Management Oversight Committee (see figure on page 1). The core participants represent key categories of those who will be involved in the eventual design, deployment and operation of the vehicles and highways of a future AHS.

Associate Participants

Associate participants of the consortium will play a vital role in the many phases of the AHS program. It is through them that the consortium will achieve a truly nationwide stakeholder consensus on major decisions and direction.



Associate participants will be drawn from all classes of stakeholders and interested parties. Several organizations have already responded favorably to preliminary contacts and discussions to become associate participants of the consortium including the following types of institutions:

- State Departments of Transportation
- Metropolitan and County Transportation agencies
- Vehicle Industry
- University Research Centers
- Other Stakeholders, e.g. private enter-

prise, professional standardization organizations, non-profit environmental organizations, air quality management agencies, and intergovernmental agencies.

The extended NAHSC of core participants and associate participants represents a broad set of stakeholders in the next generation of vehicle-highway system in the U.S. It will be expanded and adjusted throughout the program as needed to meet the program's goals and objectives. ■

AHS Vision

The Automated Highway System (AHS) is part of the U.S. Department of Transportation's Intelligent Transportation System (ITS) effort. The AHS will use modern electronics to instrument highways and vehicles in a highly integrated and seamless fashion to provide "hands-off" and "feet-off" but "brains-on" vehicle operation. When fully operational, the AHS is expected to provide a safe, reliable, cost-effective highway system capable of substantially improving throughput, trans-

portation safety, and air quality along high demand travel corridors in both urban and rural areas.

The National Automated Highway System Consortium (NAHSC) has been established to (1) analyze alternative AHS concepts; (2) demonstrate the feasibility of AHS in 1997; (3) develop and test a prototype AHS; and (4) provide specification for a future operational development. ■

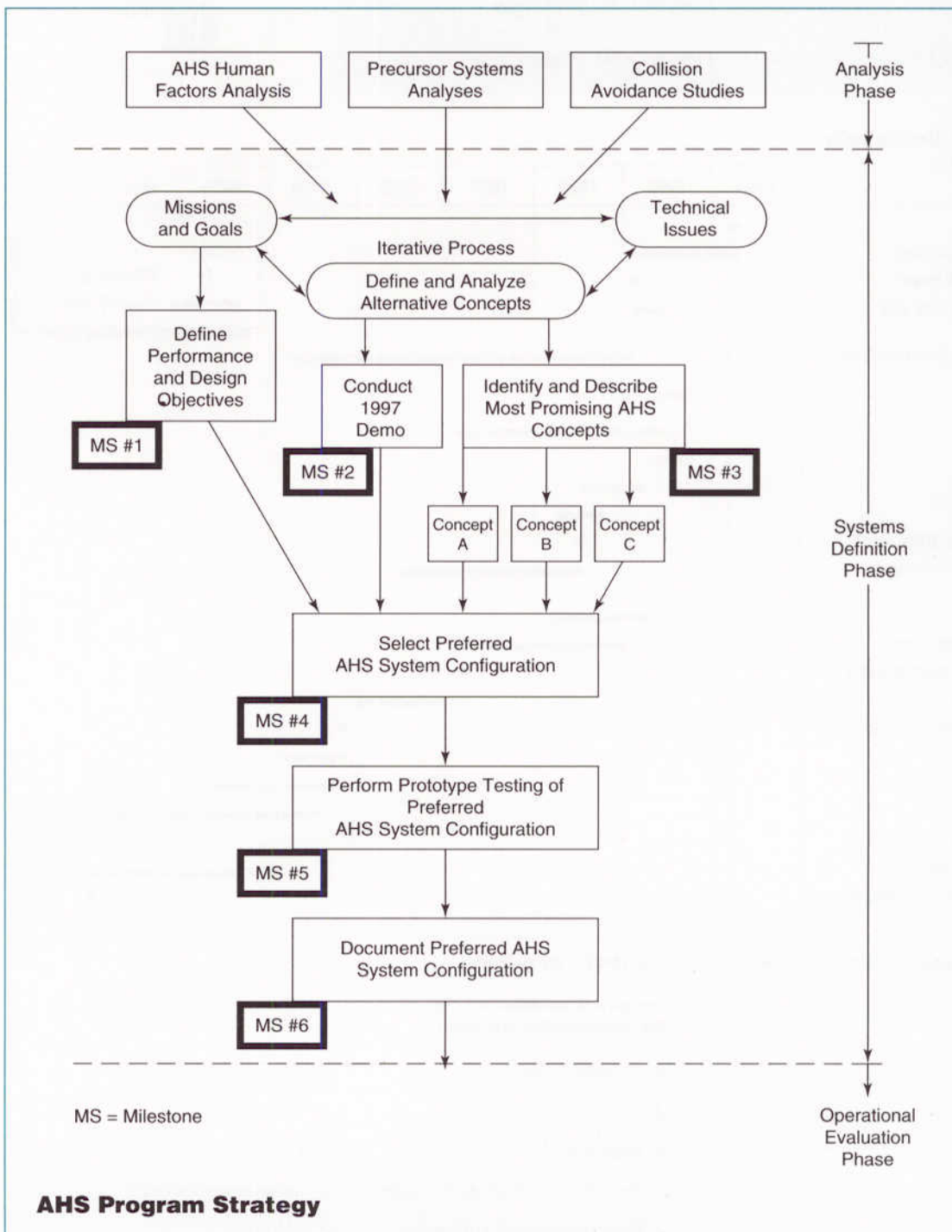
NAHSC's Strategic Approach

The consortium's work plan for the AHS program is broad in scope with an aggressive schedule and a highly organized multi-path approach. The main technical thrust will be to progressively narrow the number of alternative concepts, from a wide-ranging initial suite, to a small number (probably three) of concepts that are partially built and tested to validate high-risk issues, to a final selection

of the best AHS prototype configuration for complete construction and year-long testing. As shown in the figure below, the main flow runs through the middle of the diagram, and includes milestones 1, 3, 4, 5, and 6. In parallel with the main stream of activity, analysis, simulations, tool building and development of critical technologies are shared among multiple concepts. The consortium plans

a proof-of-concept demonstration of parts of the AHS system in 1997.

It may be premature to specify the concepts that will be tested before outreach and analysis. Based on its experience, however, the consortium has outlined the broad scope of the program and used that in developing the program plan. ■



"...this consortium and this undertaking is about much more than technology and systems analysis. At a time when society is not clear as to its values and future direction in surface transportation, it becomes the role of the National AHS Consortium to provide national leadership, focus, outreach and credibility to the AHS program."

LYLE SAXTON
Federal Highway Administration

AHS Calendar of Events

Date	Location	Event
November 1994	Chantilly, VA	Final AHS-Precursor Systems Analyses Conference
January 1995	Washington, DC	TRB Annual Meeting (Visit NAHSC desk)
March 1995	Washington, DC	ITS America Annual Meeting (Visit NAHSC booth in Exhibition Hall)
April 1995	TBD	First NAHSC Workshop
May 1995	TBD	First NAHSC Public Forum

AHS Update is a bimonthly publication of the National Automated Highway System Consortium.

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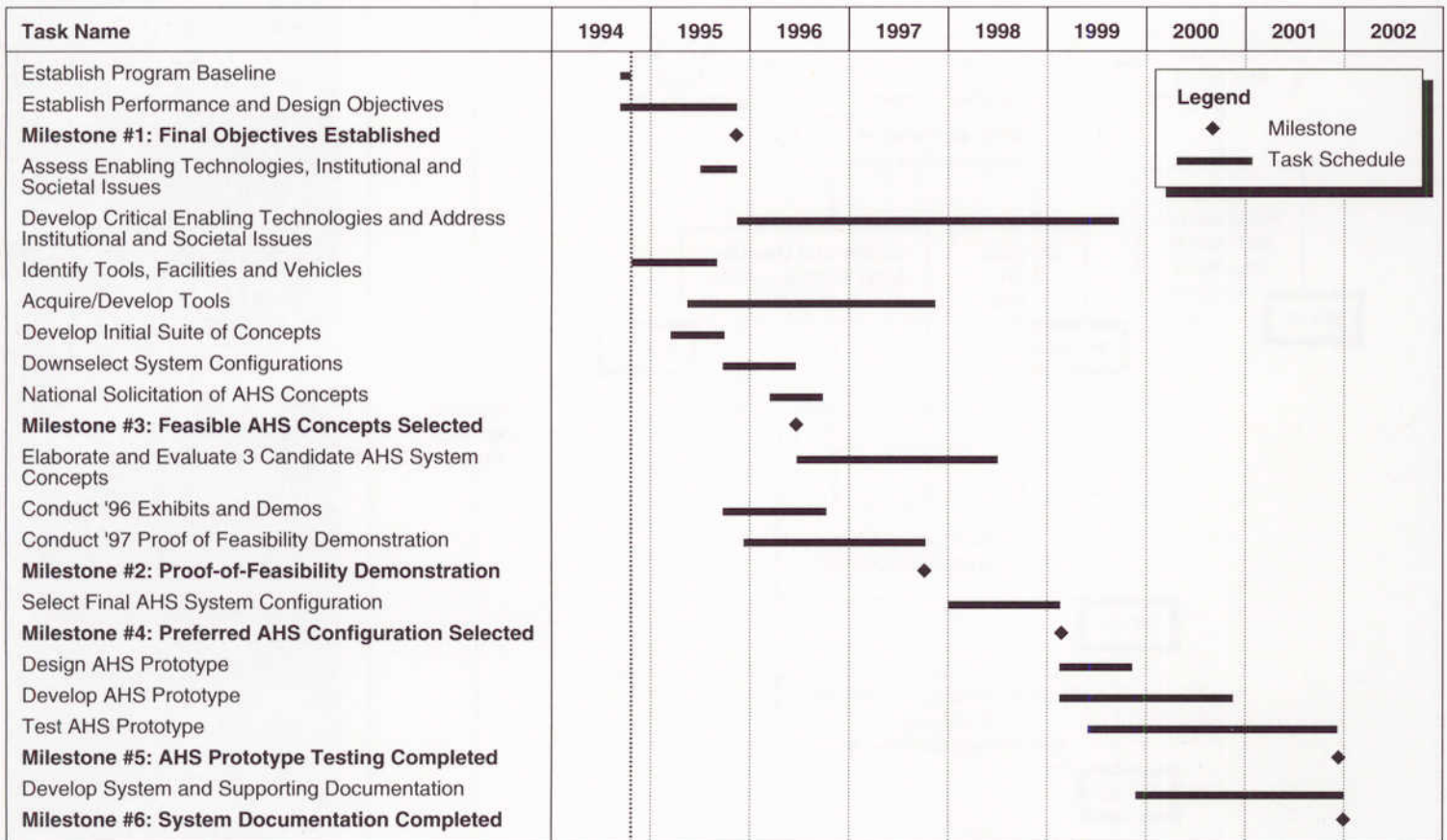
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Amy Geller

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NAHSC Milestone Program Schedule



To have your name added to the mailing list, please fax to (810) 986-3003

Name _____
 Organization _____
 Address _____
 Phone _____
 Fax _____
 AHS Areas of Interest:

Are you a member of one of the stakeholder groups?

- | | |
|---|---|
| <input type="checkbox"/> Vehicle Industry | <input type="checkbox"/> Trucking Operators |
| <input type="checkbox"/> Government Agency | <input type="checkbox"/> Transit Operators |
| <input type="checkbox"/> Highway Design Industry | <input type="checkbox"/> Transportation Users |
| <input type="checkbox"/> Vehicle Electronics Industry | <input type="checkbox"/> Insurance Industry |
| <input type="checkbox"/> Environmental Interests | <input type="checkbox"/> Other _____ |



AHS Update

A NEWSLETTER FOR THE NATIONAL AUTOMATED HIGHWAY SYSTEM CONSORTIUM

JANUARY 1995 VOL. 1 - NO. 2

Help Develop the Next Generation of the US Surface Transportation System

The National Automated Highway System Consortium (NAHSC) is seeking partnerships with sources of technology, concepts, and analysis for the development of a prototype automated highway system (AHS). We invite you to provide information about the products or services that you could supply.

The NAHSC has been selected by the United States Department of Transportation (USDOT) to lead the development of the prototype AHS. The core participants of the NAHSC are Bechtel, the California Department of Transportation, Carnegie Mellon University, Delco Electronics, General Motors, Hughes Aircraft, Martin Marietta, Parsons Brinckerhoff/Farradyne Systems, and

the University of California PATH Program.

The AHS is being developed as a potential next generation component of the US surface transportation system. Our goal is to provide an evolutionary path, beginning with advanced crash avoidance features, progressing through partial vehicle control, to finally demonstrate fully automated operation of private, public, and commercial vehicles, giving greatly increased safety, throughput, and user convenience.

While some of the analysis and prototype technology will be developed within the consortium, we plan to acquire technology and services from outside, so

there will be significant opportunities for others to participate. We are interested in a broad spectrum of support, including but not limited to the following:

Highway Systems Automation

- Highway and urban traffic operations
- Transportation planning models
- Travel demand forecasting
- Transportation system safety and hazard analysis
- Incident management

Social, Economic, and Institutional Issues

- Transportation/land use interaction

Continued on page 3



The Consortium Team: Core Participants of the NAHSC

NAHSC Profile:

Dr. James H. Rillings, GM Researcher, Leads NAHSC

Dr. Jim Rillings' broad experience will come in handy in his challenging role as program manager of the National Automated Highway System Consortium (NAHSC). Since joining General Motors in 1970, he has held positions of increasing responsibility, now serving as a Research Fellow. In his role in the consortium, he is applying many years of experience in research and program management. For example, Dr. Rillings has performed and led research in power train control systems, chassis control systems, collision warning, driver information systems, intelligent vehicles and intelligent vehicle highway systems (IVHS). Most recently he served as overall program manager for the highly successful TravTek, an advanced traveler information systems project, which was a joint public-private venture in Orlando, Florida. This project, winner of the 1992 American Society of Civil Engineers (ASCE) Transportation Achievement Award and the 1994 Intelligent Transportation Society of

America (ITS America) Board of Directors Chairman's Award, is generally regarded as an outstanding example of a USDOT/State DOT/industry cooperative program.

Prior to joining General Motors, Dr. Rillings was a research engineer at the National Aeronautics and Space Administration (NASA) Electronics Research Center. He specialized in spacecraft power systems, for which he developed computer-aided design systems. Dr. Rillings was the first Chair of the Intelligent Vehicle Highway Society of America (IVHSA), now known as ITS America, Advanced Traveler Information Systems Committee and now serves on the ITS America Coordinating Council. He is a senior member of Institute of Electrical and Electronics Engineers (IEEE) as well as a member of Society of Automotive Engineers (SAE) and Sigma XI. An outstanding professional in his field, Dr. Rillings is very capable of meeting the challenges of being the NAHSC program manager. ■



Dr. James H. Rillings

Position: Program Manager

Office: NAHSC Program Office, Troy, Michigan

Place of Birth: Mineola, New York

Education: B.S.E.E., M.S.E.E. and Ph.D. in Systems Engineering, Rensselaer Polytechnic Institute

Family: Wife Charlene

Hobbies: Travel, Woodworking, Art and Antique collecting

Home: Lives in a 55-year old house in Bloomfield Township, Michigan.

Early Notice on National Solicitation of AHS Concepts

The National Automated Highway System Consortium (NAHSC) needs to identify and analyze the most promising automated highway system (AHS) concepts. Many "representative system configurations," known as RSCs, have already been defined by the United States Department of Transportation (USDOT) as part of AHS precursor systems analysis (PSA) contracts. These RSCs will be reviewed carefully. Realistic AHS concepts will be developed based on these initial investigations. These concepts will be defined specifically in terms of their subsystems, interaction among the subsystems, and the overall operation of the designed system.

As part of this activity, the consortium will conduct a national solicitation for additional AHS concepts. This process may involve several contracts to further define concepts, leading to the selection of at least six concepts. Further information will be provided in the upcoming issue of **AHS Update**. ■

AHS Forum and Clearinghouse

ITS America now has an AHS discussion forum in its clearinghouse, facilitated by the NAHSC, for the exchange of the latest information on the AHS program. The forum consists of the following sections:

- NAHSC information and meeting notices
- Membership, outreach and involvement
- Documents and publications
- AHS requirements and system concepts
- AHS technologies

If there are other areas or information you would like to see, please let us know.

Help Develop the Next Generation

Continued from page 1

- Economics and cost/benefit analyses
- Social impacts
- Institutional issues
- Legal issues
- Environmental impacts
- Regulatory environment/process

Human Factors

- In-vehicle
- System operations

System Analysis

- AHS system architecture
- Malfunction management
- Entry and exit architecture
- Fail-safe systems
- AHS deployment

Automation of Commercial Vehicles

- Transit vehicle electronics and control
- Heavy vehicle electronics and control
- Automated ground transportation systems

Infrastructure for Automation

- Highway design
- Highway maintenance
- Advanced construction techniques
- Instrumentation
- Communication and control
- Infrastructure-to-vehicle-to-infrastructure data communication and protocol
- Control center to roadside communications and protocol
- Control systems processing
- Bandwidth allocation and interference
- Sensors: weather, traffic conditions, road impediments, systems status

Vehicles and Components

- Electronically controlled actuators (steering, brake, and throttle)
- Built-in tests and diagnosis
- Customer demand/cost sensitivity
- Model emissions prediction
- Human/machine interface
- Sensors: vehicle systems status, driver condition, object detection, longitudinal separation and closing rate, lateral separation

and closing rate, vehicle position relative to lane and road boundaries

- Command and control systems: vehicle dynamics and modeling, vehicle control theory and technologies, on-vehicle computer processor, failure detection and diagnosis, in-vehicle area data networking, vehicle-to-vehicle data communications and protocol
- Sensing: sensors for monitoring vehicle, states and status, sensors for detecting vehicle position relative to neighboring vehicles and highway markings, obstacle detection and avoidance, sensor fusion

Design for Safety

- Fail-safe systems and components
- Software safety
- Systems safety

Organizations and/or individuals interested in participating in these aspects of the AHS program are requested to:

1. Identify their area of interest from the list above;
2. Provide a brief (1-2 page) description of the product, service, analysis or research they are interested in providing and;
3. Provide a statement of qualifications.

These statements may be accompanied by supporting materials such as product and company brochures. The NAHSC will use this information in the needs assessment phase of the program, and to build the database of potential suppliers and subcontractors. The NAHSC is not seeking nor can it accept any confidential or proprietary information at this stage.

For more information, please write to:
Kurt A. Goddard, Business Manager
NAHSC Program Office
Suite 500
3001 West Big Beaver Road
Troy, MI 48084 ■

Sign Up Now for the First AHS System Definition Workshop

The National Automated Highway System Consortium (NAHSC) and the Institute of Transportation Engineers (ITE) invite you to participate in a workshop to help shape the future of the US surface transportation system. The workshop will be held on April 12 and 13 in Fort Lauderdale immediately following the ITE meeting at the same site. By participating in this important workshop, you will learn what the program is all about, the important contributions an automated highway system (AHS) could make to short-term and long-term transportation planning, and the impacts on you and other stakeholders. In this first workshop, the NAHSC will present the initial set of functional requirements, and you and other stakeholders will have a chance to provide feedback to the consortium. This is the first of several planned workshops and public forums that the NAHSC will sponsor.

AHS Calendar of Event

Date	Location	Event
January 22-28, 1995	Washington, DC	TRB 74th Annual Meeting (AHS Session-179B, Thursday January 26, 10:30 am. Also Visit NAHSC Desk)
March 1, 1995	Detroit, MI	SAE International Conference (AHS Session)
March 15-17, 1995	Washington, DC	ITS America Annual Meeting (Visit NAHSC Booth in Exhibition Hall)
April 10-12, 1995	Ft. Lauderdale, FL	ITE Semi-Annual Meeting (AHS Session, Wednesday April 12)
April 12-13, 1995	Ft. Lauderdale, FL	NAHSC System Requirements Workshop (In Conjunction with ITE Meeting)

To have your name added to the mailing list, please fax to (810) 986-3003

Name _____ Organization _____
 Address _____ AHS Areas of Interest: _____
 Phone _____
 Fax _____

Are you a member of one of the stakeholder groups?

- | | | |
|---|--|---|
| <input type="checkbox"/> Vehicle Industry | <input type="checkbox"/> Environmental Interests | <input type="checkbox"/> Insurance Industry |
| <input type="checkbox"/> Government Agency | <input type="checkbox"/> Trucking Operators | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> Highway Design Industry | <input type="checkbox"/> Transit Operators | _____ |
| <input type="checkbox"/> Vehicle Electronics Industry | <input type="checkbox"/> Transportation Users | _____ |

NAHSC Program Office

Suite 500
 3001 West Big Beaver Road
 Troy, Michigan 48084



NAHSC Core Participants

- **Bechtel Corporation**
(Transportation design and construction representative)
- **The California Department of Transportation**
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- **Carnegie-Mellon University Robotics Institute**
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(Vehicle electronics industry representative)
- **General Motors**
(Vehicle industry representative)
- **Hughes Aircraft**
(Aerospace systems industry representative)
- **Martin Marietta**
(Aerospace/electronics systems industry representative)
- **Parsons Brinckerhoff/Farradyne Systems Inc.**
(Transportation infrastructure and systems engineering representative)
- **The University of California Partners for Advanced Transit and Highways (PATH) Program**
(Leading AHS research group in the U.S.)

In cooperation with the
 United States
 Department of Transportation

AHS Update is a bimonthly publication of the National Automated Highway System Consortium.

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AHS Update

MARCH 1995 VOL. 1 - NO. 3

A newsletter for the

NATIONAL AUTOMATED HIGHWAY SYSTEM CONSORTIUM

NAHSC Workshop Opportunities for Participation

March 27-28, 1995
Sterling Heights, Michigan

Monday, March 27, 1995

9:30 am - 1:00 pm

Registration

1:00 pm - 2:15 pm

Welcome and Introduction

1. Purpose and Objectives of the Workshop

2. Agenda

3. Description of the National Automated Highway System Consortium

4. Status of the Automated Highway System Program, Schedules, Deliverables

5. Opportunities for Participation in the AHS Program

- Core Participants
- Associate Participants
- Outreach Participants
- Contractors

6. Discussion

2:15 - 2:30 pm

Break

2:30 - 3:00 pm

7. Organization of Workshops

- Schedules
- Intended Deliverables

3:00 - 5:30 pm

Breakout Workshops

5:30 pm

Adjourn

Tuesday, March 28, 1995

8:00 - 8:45 am

Continental Breakfast

8:45 - 9:30 am

8. Reconvene Plenary Session

- Status of Workshops
- Questions and Answers

9:30 am - 12:00 noon

Reconvene Workshops

12:00 noon - 1:30 pm

Lunch

1:30 - 4:00 pm

Reconvene Workshops

4:00 - 5:00 pm

Final Plenary Session

9. Summary, Conclusions and Action Items

- Status of Workshops
- Discussion
- Action Items and Datelines

5:00 pm

Adjourn

Investigate Opportunities for Participation in the National AHS Consortium

The National Automated Highway System Consortium (NAHSC) will hold an *Opportunities for Participation* Workshop on March 27-28, 1995.

The Workshop

The NAHSC invites you to participate in a workshop that will inform interested organizations about the Automated Highway System (AHS) program and provide information regarding opportunities for participation in the consortium. Central to the NAHSC approach is the development of a national consensus among stakeholders on the optimum AHS system configuration and deployment strategy. Involvement of a broad range of stakeholders in program activities is a key aim of the NAHSC; this workshop is one step in the process.

The Location

Workshops will be held at the following site and we recommend conference lodging at the site:

Sterling Inn

34911 Van Dyke Avenue

Sterling Heights, Michigan 48312

Tel: 810-979-1400

Fax: 810-979-0430

Maps will be provided after you confirm your registration. Please contact the hotel directly for your accommodations. If you call Monday through Friday, 9:00

am to 5:00 pm EST, ask for Christine Woodruff and cite group number G5295 for a special rate of \$64.00 per day.

Registration

A registration fee of \$100 is required to help cover out-of-pocket meeting expenses, including meeting rooms, lunch on March 28, and all refreshment breaks. No telephone requests for registration will be accepted. Payments may be made by check or money order. Space is limited, so early registration is recommended. There is no discount for multiple attendance from a single organization. Registration forms and information are available from Ms. Linda Buys, NAHSC Coordinator (Tel: 810-816-3403).

Questions regarding the workshops may be directed to William M. Spreitzer, NAHSC PMOC Chair (Tel: 810-986-2916). ■

New NAHSC Program Office Opens

Good news! The NAHSC program office is in full operation. The new office now houses 13 staff members (a lucky start?). Details follow:

NAHSC Program Office
Suite 500, 3001 West Big Beaver Road
Troy, Michigan 48084
Tel: 810-816-3400, Fax: 810-649-9569

The program office manages the day-to-day operations of the AHS program and provides the focus and discipline necessary to achieve the AHS program goals.

**University of California
PATH Program**

Dr. Steven Shladover (ScD in Mechanical Engineering), technical director of the Partners for Advanced Transit and Highways (PATH) program, has been conducting AHS research for more than 20 years. He supervises the AHS research of PATH staff, including work on the Honeywell AHS Human Factors project and a variety of AHS-Precursor System Analysis projects.

Parsons Brinckerhoff (PB)

Donald Orne, a Michigan registered civil engineer, has 39 years of experience in transportation. He recently joined Farradyne Systems, Inc., a PB company, and serves as program manager for the AHS program. Mr. Orne was the director of transportation systems at TRW/ESL and was also director of the UC PATH program. Previously, he served under various transportation engineering positions for 36 years at the Michigan DOT.

Martin Marietta (MM)

Walter Faulconer has spent 16 years working on advanced technology projects in the space program. He manages MM's IVHS projects organization. Notable projects include the AHS lateral/longitudinal precursor contract and the definition of the Denver traffic operations center. Mr. Faulconer has a BS in space science and an MS in systems management.

Hughes Aircraft Company

James Lewis is senior engineer and project manager in the advanced systems development organization. He managed Hughes' participation in the TravTek demonstration project in Orlando, Florida, and led the development of control system concepts for the Federal Railroad Administration's National Maglev Project. Mr. Lewis has an MS in electrical engineering.

United States

Department of Transportation

Richard Bishop, Jr. is the AHS program manager for the Federal Highway Administration (FHWA). Previously, Mr. Bishop served as a communications/systems engineer for the National Security Agency of the United States Department of Defense for 10 years. He holds a BS in electrical engineering and an MA in technical management.

Bechtel Corporation

Dr. Joseph Perkowski (PhD in civil engineering) has 17 years of experience in new communication technology, advanced transportation systems research and planning, and direct application multifunctional metropolis planning, such as technology systems integration for high rise structures. He is the manager of advanced civil systems in Bechtel's applied physics and civil programs department.

Who's Who in the PMC?

The Program Manager's Council (PMC), led by program manager Dr. James Rillings, plans and manages the AHS program with the support of the program office. The PMC consists of the nine AHS project managers from the core participants and the United States Department of Transportation agreement officer's technical representative (AOTR). These PMC members individually manage the project activities of their home organizations to assure their contribution to the overall program. The PMC meets monthly with the program office staff to review program progress and coordinate the work of the core participants.

**California Department of
Transportation (Caltrans)**

Sompol Chatusripitak, a California registered electrical engineer and an MBA graduate, has more than 14 years of experience with Caltrans. He is responsible for Caltrans' research efforts on advanced vehicle control systems, infrastructure modification for intelligent vehicle-highway systems (IVHS), and alternative fuels/vehicles, among others.

**Carnegie Mellon University,
Robotics Institute**

Dr. Charles Thorpe (PhD in computer science), a senior research scientist, directs the Navlab project. The Navlab vehicles are prototypes for autonomous outdoor driving. The underlying techniques include neural networks, image understanding, and artificial intelligence. The Navlab project has focused on investigation of robotics in hazardous environ-

General Motors (GM)

Dr. Roger Fruechte (PhD in electrical engineering) currently heads the vehicle systems research department at the GM research and development center. He is responsible for several research projects related to IVHS, crash avoidance, vehicle control systems, and advanced suspension systems. Dr. Fruechte has also directed programs on gasoline-electric hybrid vehicles and maglev transit vehicles.

Delco Electronics

Ashok Ramaswamy holds MS degrees in nuclear engineering and electrical engineering. He was responsible for software development at the integrated circuit design group and the IVHS and mobile communications development group. He was the program manager of Delco's TELEPATH IVHS concept vehicle, state-of-the-art in communication navigation and display technologies.

Join the Workshop on AHS Performance Objectives and Characteristics

The National Automated Highway System Consortium (NAHSC) is hosting a workshop to examine and clarify issues that will guide the Automated Highway System (AHS) specification development. The workshop will be held at the Marina Marriott Hotel in Ft. Lauderdale, FL, on April 12 and 13, 1995. This is the first of several forums for stakeholder participation in the AHS Program to seek input on the definition, demonstration, and selection of an AHS design and operations concept.

Workshop Goals

The goal of the workshop is to ensure AHS performance objectives and characteristics reflect the needs of various stakeholders and balance different stakeholder viewpoints. These objectives will serve as the principal guidance to NAHSC in specifying and developing a prototype AHS over the next few years. Active stakeholder involvement is critical to ensure the AHS program responds to the collective transportation demands of our society. Stakeholders from vehicle and vehicle electronics industries, government agencies, the highway design industry, environmental interests, trucking operators, transit operators, transportation users, the insurance industry and others are invited to contribute their viewpoints. Interactive involvement between stakeholders and the NAHSC will clarify performance objectives and system characteristics that reflect the principal AHS goals of increased highway safety and efficiency, mobility of people, movement of goods, productivity, and the quality of life.

The NAHSC will present a description of the AHS performance objectives and characteristics to the diverse stakeholder

audience and receive constructive feedback during the workshop. Interactive sessions are planned to facilitate incorporating stakeholder viewpoints into the NAHSC AHS design process and to establish a common understanding of AHS within the transportation community. This common understanding of the performance objectives and system characteristics will support subsequent interactive discussions during this workshop covering critical issues facing implementation of AHS and examining the ramifications to the system requirements currently under development by the NAHSC.

Workshop Registration

Registration information is available from Irene Hay in the NAHSC Program Office (Tel: 810-816-3400). All pre-registrants will receive a draft copy of the AHS system description document approximately three weeks before the April 12 session. The document will include:

- An AHS system overview
- Definition of the principal AHS performance objectives and characteristics
- Description of the AHS system boundaries with respect to users, adjacent highway operations, vehicle subsystems, and others
- Description of AHS functions
- Description of critical issues for discussion in guiding the development of detailed system requirements

Specific interactive sessions are planned for the discussion of performance objectives and characteristics and critical issues to AHS program implementation. The NAHSC encourages you to register in advance and receive the system description materials which will help you experience a productive workshop. All attendees will receive the system description materials at the workshop. ■

NAHSC Workshop AHS Performance Objectives and Characteristics

April 12-13, 1995
Ft. Lauderdale, Florida

Wednesday, April 12, 1995

- 9:00 am – 1:00 pm
Registration
- 1:00 – 1:15 pm
Welcome & Workshop Overview – Plenary Session
- 1:15 – 2:00 pm
AHS Program Overview – Plenary Session
 - Federal Government Perspective
 - AHS Program Plan & Status
 - Current Activities (including 1997 Demo)
 - Core Participants & Associate Participants
 - Subcontractor Opportunities
- 2:00 – 2:30 pm
Requirements and Review Process – Plenary Session
- 2:30 – 2:45 pm
Break
- 2:45 – 5:00 pm
AHS Objectives & Characteristics – Parallel Breakout Sessions
 - Answer the Question:
 - What Attributes Will Make AHS Worth Implementing?
- 5:00 – 7:00 pm
Reception and Poster Session – Breadth of NAHSC Activities
 - Plans for 1997 Demonstration
 - Plans for Solicitation, Evaluation, and Selection of AHS Concepts
 - Plans for Identification and Development of Technologies Enabling AHS
 - Plans for Addressing Institutional and Societal Issues
 - Opportunities for Stakeholder, Associate and Subcontractor Participation

Thursday, April 13, 1995

- 7:30 – 8:30 am
Coffee and Rolls
- 8:30 – 12:00 noon
AHS System Requirements – Parallel Breakout Sessions
 - Objectives and Characteristics Feedback
 - Parallel Sessions Focus on Critical Issues
 - Safety and Performance
 - Operations and Infrastructure
 - Institutional and Societal Needs
 - Driver Involvement
 - Evolution and Deployment
- 12:00 noon – 1:00 pm
Lunch
- 1:00 – 3:00 pm
Feedback on All Breakout Sessions – Plenary Session
- 3:00 – 5:00 pm
Questions and Answers – Plenary Session
- 5:00 pm
Adjourn

AHS Calendar of Events

Date	Location	Event
March 1, 1995	Detroit, MI	SAE International Conference (AHS Session)
March 15-17, 1995	Washington, DC	ITS America Annual Meeting (Visit NAHSC Booth in Exhibition Hall)
March 27-28, 1995	Sterling, MI	NAHSC Opportunities for Participation Workshop
April 10-12, 1995	Ft. Lauderdale, FL	ITE Semi-Annual Meeting (AHS Session, Wednesday April 12)
April 12-13, 1995	Ft. Lauderdale, FL	NAHSC Workshop on AHS Performance Objectives and Characteristics (In Conjunction with ITE Meeting)

To have your name added to the mailing list, please fax to (810) 649-9569

Name _____ Organization _____
 Address _____ AHS Areas of Interest: _____
 Phone _____
 Fax _____

Are you a member of one of the stakeholder groups?

- | | | |
|---|--|---|
| <input type="checkbox"/> Vehicle Industry | <input type="checkbox"/> Environmental Interests | <input type="checkbox"/> Insurance Industry |
| <input type="checkbox"/> Government Agency | <input type="checkbox"/> Trucking Operators | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> Highway Design Industry | <input type="checkbox"/> Transit Operators | _____ |
| <input type="checkbox"/> Vehicle Electronics Industry | <input type="checkbox"/> Transportation Users | _____ |

NAHSC Core Participants

- **Bechtel Corporation**
(Transportation design and construction representative)
- **The California Department of Transportation**
(State/regional/metropolitan transportation agencies representative)
- **Carnegie-Mellon University Robotics Institute**
(Center for research on machine/vehicle intelligence)
- **Delco Electronics**
(Vehicle electronics industry representative)
- **General Motors**
(Vehicle industry representative)
- **Hughes Aircraft**
(Aerospace systems industry representative)
- **Martin Marietta**
(Aerospace/electronics systems industry representative)
- **Parsons Brinckerhoff**
(Transportation infrastructure and systems engineering representative)
- **The University of California Partners for Advanced Transit and Highways (PATH) Program**
(Leading AHS research group in the U.S.)

In cooperation with the
**United States
Department of Transportation**

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AHS Update is a bimonthly publication of the National Automated Highway System Consortium.

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AHS Update

MAY 1995 VOL. 1 - NO. 4

A newsletter for the

NATIONAL AUTOMATED HIGHWAY SYSTEM CONSORTIUM

April AHS Objectives and Characteristics Workshop a Success

The Automated Highway System (AHS) Objectives and Characteristics Workshop, the first for the National Automated Highway System Consortium (NAHSC), was held on April 12 and 13 in Ft. Lauderdale, Fla., in conjunction with the Institute of Transportation Engineers (ITE) semi-annual meeting. Over 70 representatives from industry, state departments of transportation, local transportation agencies, environmental organizations and universities attended the workshop. The workshop included interactive sessions on AHS performance and safety, driver involvement, operations and deployment, and institutional and societal issues. Attendees were also able to meet with NAHSC task leaders to exchange ideas on concept evaluation, the '97 demonstration and other ongoing tasks.

A draft of the AHS Objectives and Characteristics Document, produced by the NAHSC, was distributed to all attendees for their review and comment, and to provide a focus for the workshop. This document provides a description of the overall benefits that must be derived from a developed AHS if it is to be viable from a technical, economic, and social perspective. The interactive sessions provided valuable feedback to the NAHSC team. A new

Continued on page 3



March Workshop Covers NAHSC Participation

More than 110 organizations attended the NAHSC's Opportunities Forum in Sterling Heights, Mich., on March 27 and 28. The forum included workshops on Consortium participation for Outreach and Associate participants, Core participants and Contractors. All interested organizations were provided with outreach and associate participation documents. These documents, when completed, commit an organization to the Consortium in a mutually beneficial way.

Forum attendees also learned about USDOT contract requirements, including the cost-share expectation and contract award evaluations.

Bill Spreitzer, the Forum Coordinator and Chairman of the NAHSC Program Management Oversight Committee, expressed his gratitude with the attendance. "This was above and beyond our expectations," he commented. One of the successes of the Forum was the establishment of leadership by volunteer organizations in a few of the Outreach categories.

If your organization would like to know how you can participate in the Consortium, fax your request to Kurt Goddard at (810) 649-9569. ■

OUR VISION...

The AHS will be a key part of the next generation surface transportation for the United States. It aims to enhance life's quality by significantly improving transportation's safety, mobility and quality with beneficial environmental effects. The AHS will provide automatic transit, commercial and private vehicle operation in special lanes and facilitate more productive intermodal movement of people and goods.

OUR MISSION...

NAHSC will specify, develop and demonstrate a prototype AHS. The specification will provide for an evolutionary deployment that can be tailored to meet regional and local transportation needs. The Consortium will seek opportunities for early introduction of vehicle and highway automation technologies to achieve benefits for all surface transportation users. The NAHSC will incorporate public and private stakeholder views to ensure that an AHS is economically, technically and socially viable.

AND OUR OUTREACH COMMITMENT...

The Consortium is committed to achieving national consensus on major AHS decisions by engaging all stakeholders to help define system requirements, evaluate system concepts and apply enabling technologies. This will ensure that an AHS is viable and responds to regional and local, as well as system user, needs.

NAHSC Profile: William M. Spreitzer

Chair, NAHSC Program Management Oversight Committee (PMOC)

Bill Spreitzer brings forty-three years of relevant experience to Intelligent Transportation Studies and is a recognized world leader in Intelligent Transportation Systems (ITS) and transportation research. His areas of experience include advanced automotive gas turbine engine development, full-scale and on-the-road concept vehicle development in applications of gas turbines, advanced transmissions and automatic vehicle controls to automobiles, buses, heavy trucks and a variety of wheeled and tracked military vehicles. In addition, he has worked in research development programs in advanced transportation systems (U.S. Department of Housing and Urban Development: Study of New Systems for Urban Transportation) and interdisciplinary studies of future transportation systems.

Presently, as the Technical Director of General Motors ITS Program, Mr. Spreitzer is responsible for planning and coordination of General Motors ITS Program throughout the Corporation and worldwide.



William M. Spreitzer

Position: Program Management Oversight Committee (PMOC) Chair

Office: ITS Program Office, Detroit, Michigan

Place of Birth: Highland Park, Michigan

Education: B.Ae.E. and P.Ae. E. in Aeronautical Engineering, University of Detroit

Family: Wife Rose Marie, Children Barbara and Christopher

Home: Beverly Hills, Michigan

Mr. Spreitzer started as a college-graduate-in-training at General Motors Research Laboratories. He then joined the Gas Turbines Department as a research engineer. Later, he was appointed senior

liaison engineer with GM's Research Laboratories. Mr. Spreitzer held various managerial positions in GM until 1991, when he was named technical director of General Motors ITS Program, the position he currently holds.

Mr. Spreitzer is also involved in national and international ITS efforts. He is a member of ITS America Coordinating Council, ITS America Planning Committee, chair of the United States Delegation for Technical Advisory Group (TAG), International Standards Organization (ISO), and Transport Information and

Control Systems (TICS). He is the chair of American Automobile Manufacturers Association (AAMA) ITS Council, member of National Research Council and a member of Transportation Research Board (TRB), ITS IDEA Review Board and ITS World Congress. ■

News Briefs

- Dr. James Rillings, the NAHSC program manager, and Eugene McCormick of Parson Brinckerhoff provided testimony before the House Transportation Appropriation Subcommittee regarding the NAHSC Program on March 23, 1995.
- American Association of State Highway and Transportation Officials (AASHTO) was the first to join the NAHSC as an associate member representing state Departments of Transportation. Dr. Robert Maki, Michigan State DOT's traffic and safety engineer, represents AASHTO in the Consortium.
- The NAHSC staff participated in the Second Annual Symposium for a Smart New Jersey. The program generated a lot of interest at the local and state level.
- The NAHSC system engineering teams are currently incorporating the final comments on the AHS System Objectives and Characteristics Document and it should be mailed to the April workshop participants shortly. Others interested to receive a copy should call the program office at (810) 816-3400.
- The AHS is generating a lot of news media interest. Dr. James Rillings, the NAHSC program manager, had an interview with CNN on March 21, 1995. The NBC Siber show is planning to show clips of the AHS video in the near future.

Status Report on Assessment of Enabling Technologies

One of the key goals of the NAHSC is to develop enabling technologies for the AHS prototype. As part of this effort, the Consortium has formed a Technology Group to review and assess critical enabling technologies. The group has identified 29 technology categories, grouped into the following seven areas:

- On-vehicle sensing devices
- Roadway and infrastructure sensing devices
- Vehicle actuators

- Vehicle-to-vehicle and vehicle-to-roadway communication
- Command and control processing
- Algorithms
- Infrastructure and configuration

The Technology Working Group is currently reviewing state-of-the-art technologies for each category and will develop performance specifications based on the system requirements being identified under the Consortium system engineering effort. The group will also identify technologies

that are critical for implementing AHS functions but are not yet available and will develop a plan for experimentally evaluating the potential technologies for the AHS prototype.

The development of some of the technologies that require a long lead time will be initiated this June. In addition to the NAHSC development efforts, opportunities for participation in the technology development will also be available through solicitation. ■

NAHSC Addresses Societal and Institutional Issues

Addressing Societal and Institutional issues has been part of the Consortium commitment from the beginning. A working group of NAHSC Core Participants has reviewed the research completed as part of FHWA's Precursor Systems Analyses to determine what additional research is needed. Among other activities, the working group is examining how to measure societal impacts, identifying stakeholders on the state and local levels that may be involved in deploying AHS and what kind of information would be most useful to them. At the same time the Societal and Institutional Working Group is coordinating with other early tasks in the NAHSC process, including systems requirements, concept development and the 1997 demonstration, to determine what is needed in the outreach, development, demonstration and prototype deployment process and when.

Problem Statements were defined, which became the basis of the following subtasks:

Institutional Issues

- Impact of federal regulations on AHS development and deployment
- How AHS can fit into local and community goals

April Workshop

Continued from page 1

draft document was distributed to all workshop attendees in late May and will incorporate the views of the many stakeholders who participated in the workshop.

The AHS Objectives and Characteristics Document will serve as a guide throughout the AHS specification and development process. The AHS concept identification, evaluation and selection process has begun. The NAHSC will rely on the objectives and characteristics identified for AHS as a central criterion for evaluation

- Integrating AHS and the MPO/State DOT planning and decision process
- Identifying the most viable public and private roles in construction, operations and maintenance, and the best match to current institutions
- Monitoring and addressing legal issues

Societal Issues

- How AHS can fit into the concept of a sustainable community
- Identifying user needs and how AHS can meet them: market issues
- Identifying user needs and how AHS can meet them: human factors/psychology of automation
- How the AHS development process might incorporate social equity issues

User Needs

- Institutional constraints and considerations for operations and maintenance
- Institutional and societal issues relative to commercial vehicles in the AHS concept
- Institutional and societal issues relative to public transit vehicles in the AHS concept

Other Issues

- Institutional and societal costs, benefits and tradeoffs for MPOs, state DOTs,

individual consumers and society in general

- NAHSC's response to other environmental, jurisdictional and communications issues

The issues were discussed in sessions at the AHS Ft. Lauderdale workshop in April, eliciting some constructive input from a variety of stakeholders. The Societal and Institutional Statement of Work calls for continued efforts to solicit stakeholder input through research and development, case studies as well as the NAHSC's outreach program, the 1997 demonstration and all phases in the program.

Planners, environmental and social scientists, policy analysts and researchers from Bechtel, Caltrans, Carnegie Mellon University, Parsons Brinckerhoff and the PATH Program at the University of California are current members of the Institutional and Societal Working Group. Two initial small subcontracts have been awarded. Request for Proposals (RFPs) will be prepared and announced for some subtasks during the next quarter. It is anticipated that a significant amount of the work involved in addressing these 14 subtasks will be subcontracted. ■

and selection of promising concepts. The NAHSC is planning its second workshop for this October in San Diego in conjunction with the American Society of Civil Engineers (ASCE) 1995 Transportation Conference on AHS Concepts Evaluation.

Plan to join us at the Second Consortium Workshop scheduled for October 1995 in San Diego

The first NAHSC workshop provided invaluable guidance to establish substantial progress in clarifying the objectives and characteristics of an AHS. We have planned several future interactive ses-

sions with specific stakeholder groups, such as transit, trucking and environmental groups to further refine the objectives of AHS. These meetings will occur throughout the summer and fall. The results will be reflected in an updated version of the document and will be available at the October workshop. The NAHSC is committed to achieving a national consensus on the major aspects of AHS and continued stakeholder participation is very important.

Please contact the NAHSC Program Office at (810) 816-3400 to obtain a copy of the Objectives and Characteristics Document and to join in the AHS program activities. ■

AHS Calendar of Events

Date	Location	Event
August 5-8, 1995	Denver, CO	Institute of Transportation Engineers (ITE) Annual Meeting (AHS Session)
October, 1995	San Diego, CA	NAHSC Second Workshop on AHS Performance Objectives and Characteristics (In conjunction with ASCE Transportation Conference)
November 9-10, 1995	Yokohama, Japan	ITS World Congress
November, 1996	Orlando, FL	ITS World Congress
August, 1997	San Diego, CA	Test Track Demonstration

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 Address _____ AHS Areas of Interest: _____

 Phone _____
 Fax _____

Are you a member of one of the stakeholder groups?

- | | | |
|--|---|---|
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| <input type="checkbox"/> State Government Agency | <input type="checkbox"/> Environmental Interests | <input type="checkbox"/> Insurance Industry |
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| <input type="checkbox"/> Highway Design Industry | <input type="checkbox"/> Transit Operators | |

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- **Delco Electronics**
 (Vehicle electronics industry representative)
- **General Motors**
 (Vehicle industry representative)
- **Hughes Aircraft**
 (Aerospace systems industry representative)
- **Martin Marietta**
 (Aerospace/electronics systems industry representative)
- **Parsons Brinckerhoff**
 (Transportation infrastructure and systems engineering representative)
- **The University of California Partners for Advanced Transit and Highways (PATH) Program**
 (Leading AHS research group in the U.S.)

In cooperation with the
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- EDITOR:
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Faraz Angha
- GRAPHIC ARTIST:
Amy Geller



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NAHSC Announces Associate Participants

National Automated Highway System Consortium invites Stakeholders to Assist in the Development of Automated Highway System Plan

The National Automated Highway System Consortium (NAHSC) has announced its first Associate Participant members. These participants are expected to bring broad expertise on technical, social and environmental issues to what will ultimately be deployed as the next major performance upgrade of the nation's vehicle/highway system. The Associate Participants are:

- American Trucking Associations
- Argonne National Laboratory
- BRW Inc., Phoenix
- CCG Associates, Inc.
- Colorado Department of Transportation
- Contract Compliance, Inc.
- Creative Transit Alternatives
- Daniel Consultants, Inc.
- Dunn Engineering Associates
- Dynamic Technology Systems, Inc.
- Idaho National Engineering Laboratory
- Honda Research and Development North America
- IMRA America, Inc.

- ITS America
- Gallegos & Associates, Inc.
- Matrix Corporation
- Metropolitan Transit Authority of Harris County
- Michigan Department of Transportation
- Ministry of Transportation
- Montana State University, Western Transportation Institute
- National Institute of Standards & Technology
- New Jersey Institute of Technology/Institute for Transportation
- Oakland University, Rochester, MI
- The Ohio State University Center of Intelligent Transportation Research
- Pennsylvania Turnpike Commission
- Red Zone Robotics, Inc.
- Robotic Technology Inc.
- State University of New York at Stonybrook
- Toyota Motor Corporation
- Toyota Technical Center USA, Inc.
- Virginia Department of Transportation

Continued on page 3

NAHSC System Concepts Workshop

October 18-20, 1995, San Diego

NAHSC's Workshop #2 will provide attendees with an overview of the AHS Program status and the system objectives and concepts being developed. Participants will help explore, understand and evaluate the initial set of candidate AHS concepts. The NAHSC will present candidate concepts that respond to the AHS objectives and characteristics. Participation is encouraged to ensure the AHS concept evaluation process includes appropriate evaluation criteria and concepts representing the balance of all stakeholder needs. This workshop is a continuation of NAHSC's commitment to foster a national consensus on major AHS decisions and ensure that a technically, economically and socially viable AHS is possible.

The System Concepts workshop will continue NAHSC outreach to transportation community stakeholders begun at the AHS Objectives and Characteristics Workshop held this year in April. The NAHSC is identifying six concept

Continued on page 2

News



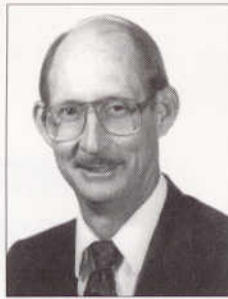
Japanese Minister of Construction Visits NAHSC
(Right to left) Japanese Minister of Construction Yoshiro Mori is greeted by U.S. Federal Highway Administration (FHWA) Associate Administrator of Research and Development John Clements, NAHSC Program Oversight Committee Chairman William Spreitzer, FHWA IVHS Research Chief C. John MacGowan and Kurt Goddard, NAHSC business manager, at a recent visit to the NAHSC program office. Mori was briefed on the formation of the public/private NAHSC partnership and its mission to develop a prototype automated highway system (AHS) in the U.S.

Introducing the new, "official" Consortium logo, depicting the Infrastructure/Multi-Vehicle interface for which the NAHSC is charged to develop the AHS system definition.



Pioneer of Intelligent Highway Systems Retires

Lyle Saxton, one of the leading visionaries and advocates in the intelligent highway systems community, retired from the Federal Highway Administration (FHWA) in June of this year. At FHWA, Lyle was the director of the Office of Safety and Traffic Operations Research and Development in their Turner Fairbank Highway Research Center. Lyle was instrumental in initiating and structuring the U.S. Department of Transportation's Automated Highway System (AHS) program.



Lyle Saxton

Lyle began his career as an electronics engineer. His initial career was in spacecraft system design where he was employed by the Astroelectronics Division of RCA and, later, NASA's Goddard Space Flight Center. He joined the FHWA in 1968 and has held a number of positions primarily involving traffic systems research and development. At FHWA he received various awards including the USDOT's Secretary's Award for Meritorious Achievement and the Transportation Research Board Roy W. Crum Distinguished Service Award.

Lyle is an internationally recognized leader in our Nation's Intelligent Transportation Systems

(ITS) program and was the moderator of the Mobility 2000 group which developed the initial national public/private support and justification for what is now the ITS program. In addition, Lyle has been a primary advocate of automated vehicle control as a supplement to the vehicle-highway system, beginning with work at Ohio State in the 1960s and General Motors in the late 1970s. It was Lyle's vision that led to the inclusion of automated vehicle control as an important part of the USDOT's ITS program. Through his advocacy FHWA pursued a public/private partnership for conducting the Automated Highway System (AHS) program. After formation of the NAHSC, Lyle was the USDOT representative to the NAHSC's Program Management Oversight Committee (PMOC).

Lyle's leadership, expertise and vision will be missed as the NAHSC continues his mission into the next century. ■

October Workshop

Continued from page 1

"families" comprised of AHS operations and design concepts. The concepts were conceived, in part, from a thorough review of the Precursor Systems Analyses contractor efforts and from responses received from a national solicitation for AHS concepts. The Consortium will also establish representative applications for AHS technology deployment and other appropriate criteria by which individual concepts and concept families will be evaluated. The Consortium plans to select three specific concepts by the summer of 1996 for further investigation and analysis.

The initial set of AHS concept families is the second critical step in the development of the AHS prototype. Participation is valued to help ensure that a broad range of candidate concepts is considered. The NAHSC is committed to

engage stakeholder participation, ensuring that the AHS program continues to meet the needs and collective demands of our society.

Subsequent workshop topics will include assessment of three specific concepts and design, testing and evaluation of the AHS prototype.

Who Should Attend?

The NAHSC seeks attendees representing a cross-section of stakeholders to help establish effective AHS functional requirements from the following groups:

- State and Local DOT Officials
- Metropolitan and Local Transportation Agency Officials
- Commercial and Private Vehicle Operator's Representatives
- Transit Operators
- Vehicle Industry Professionals
- Transportation Environmentalists and Planners

NAHSC System Concepts Workshop

October 18-20, 1995, San Diego, California

Wednesday, October 18, 1995

6:00—8:00 pm

Registration, Welcome Reception

Thursday, October 19, 1995

7:30—8:30 am

Continental Breakfast
(registration desk opens)

8:30—8:45

Welcome and Workshop Orientation

8:45—9:45

AHS Program Status

9:45—10:00

Program Status and Issues Breakout
Session Instructions

10:00—10:15

Break

10:00—Noon

Program Status and Issues Breakout
Sessions

Noon—1:00 pm

Buffet Lunch

1:00—1:50

Program Status and Issues Breakout
Session Feedback Plenary

1:50—2:30

AHS System Requirements and Results
from Workshop #1

2:30—2:45

Break

2:45—5:00

AHS System Requirements Breakout
Sessions

5:00—7:00

AHS Workshop Reception and Displays

Friday, October 20, 1995

7:30—8:00 am

Continental Breakfast

8:00—9:30

System Requirements Feedback Plenary

9:30—10:15

AHS Concepts Overview Plenary

10:15—10:30

Break

10:30—Noon

AHS Concepts Breakout Sessions

Noon—1:00 pm

Lunch

1:00—2:30

Concept Breakout Sessions Continue

2:30—2:45

Break

2:45—3:15

Future Concept Evaluations and
Selections Plenary

3:15—4:30

Concept Breakout Session Feedback
Plenary

4:30—5:00

General Question and Answer Session
Workshop Wrap-up

5:00

Adjourn

NAHSC Awards Contracts for Automated Highway System Concepts

The nine-member National Automated Highway System Consortium (NAHSC), in partnership with the United States Department of Transportation (U.S. DOT), has awarded seven contracts for the development of automated highway system (AHS) concepts to improve safety and relieve traffic congestion in the U.S.

NAHSC AHS concept contracts were awarded to Battelle of Cleveland, Ohio; Calspan, Buffalo, NY; Haugen Associates, Troy, Mich.; Honeywell, Minneapolis, Minn.; SRI International, Palo Alto, Calif.; Toyota Motor Corp.; and Virginia Polytechnic Institute and State University ("Virginia Tech") in Blacksburg, VA.

In April, the NAHSC issued a national solicitation for concepts through the Commerce Business Daily and the Internet. Submitted AHS concept proposals were required to have the following characteristics:

- Provide fully automated driving of motor vehicles on limited access highways;
- Provide significantly increased safety and throughput over conventional highways;

- Operate with automobiles, buses and trucks;
- Incorporate a non-contact electronics-based design;
- Reduce the environmental impacts of vehicular travel;
- Be highly reliable and;
- Be feasible and affordable

The NAHSC required proposals for complete AHS concepts rather than proposals for a specific technology. Proposals also addressed operational scenarios and descriptions of baseline functions such as manual/automatic control transitions and road hazard detection, among several other required functions deemed necessary for an automated highway system.

Criteria for concept evaluation were based on merit, uniqueness, responsiveness and the ability of the technology to meet the NAHSC Systems Objectives and Characteristics first released at the Consortium's first public workshop held last April in Ft. Lauderdale, Fla.

The contract awards are being executed by five of the NAHSC Core Participants. Consortium

Core and Associate Participants are evaluating the concepts against the AHS System Objectives and Characteristics. The work done under these contracts will supplement the Consortium's system concept development endeavors.

The NAHSC System Concept Workshop in October will provide the forum for a broad range of stakeholders to work on system concepts development. These analyses will result in a grouping of the AHS concepts into six concept families for further analysis and downselection.

NAHSC Program Manager Dr. James H. Rillings describes the process as "...a whittling down to the best AHS concepts." Rillings adds, "The NAHSC is especially interested to receive input from specialized groups of stakeholders — for example, the people who will use or operate the AHS system. Their feedback is vital to developing the best system for the U.S." For more information about the NAHSC System Concepts Workshop, contact JoAnn Breckenridge at 1-800-296-0995. ■

NAHSC Associate Participants

Continued from page 1

- Virginia Polytechnic Institute and State University Center for Transportation Research (Virginia Tech)
- Wilbur Smith Associates
- Zapata Engineering

NAHSC Associate Participant selection criteria are based upon an organization's commitment to the development of AHS and completion of the Associate Participant Application and Agreement.

Following review by the NAHSC Core Participants, the Associate Participant is placed in a stakeholder category for representation on the NAHSC Program Manager Oversight Committee (PMOC). Stakeholder categories include: the highway design industry, vehicle electronics industry, state/local government

agencies, environmental interests, transportation users, the vehicle industry, insurance industry and transit operators.

In addition to representing their stakeholder category on the PMOC and offering important input by participating in workshops and issues task forces, Associate Participants support the Consortium's technical mission to carry out the systems definition phase of AHS development.

NAHSC Associate Participants

Ray Pethel, interim director of the Virginia Tech Center for Transportation Research describes the Center's Associate Participant role as "...a natural tie-in to our partnership with the Virginia Department of Transportation Intelligent Transportation System (ITS) project." He adds, "We're proud to be named the first NAHSC Associate Participant. Our participation will allow us to help shape the direction and overall character of transportation into the 21st century."

NAHSC Program Manager Jim Rillings explains, "The selection of our first ten Associate Participants is a vital step towards developing a consensus from stakeholders on what an AHS system should be. These Associate Participants are established technology leaders who represent a wide scope of expertise on both societal and technical issues — their input is key to our mission of achieving a national consensus."

Prospective Associate Participants should complete an application, listing their organization's capabilities and interests. To receive an application, fax or write Rob Meinert at:

NAHSC Participant Program Manager
3001 West Big Beaver Road, Suite 500
Troy, Michigan 49084
Fax: 810-649-9569 ■

AHS Calendar of Events

Date	Location	Event
October 1995	San Diego, CA	NAHSC Second Workshop on AHS Performance Objectives and Characteristics (In conjunction with ASCE Transportation Conference)
November 9-11, 1995	Yokohama, Japan	ITS World Congress
April 15-18, 1995	Houston, TX	ITS America, Sixth Annual Meeting
October 14-18, 1996	Orlando, FL	ITS World Congress
August 1997	San Diego, CA	Test Track Demonstration

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- **General Motors Corp.**
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- **Hughes Aircraft Co.**
(Aerospace systems industry representative)
- **Lockheed Martin**
(Aerospace/electronics systems industry representative)
- **Parsons Brinckerhoff Inc.**
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- **The University of California Partners for Advanced Transit and Highways (PATH) Project**
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Delivery of Milestone 1 Marks Successful First Year for NAHSC

In November, the NAHSC delivered its Milestone 1 document to the U.S. Department of Transportation. Milestone 1 consists of the NAHSC Program Plan and AHS (automated highway system) performance & design objectives.

The NAHSC Program Plan includes the

Program description, work breakdown structure, task leader assignments and summaries, and a master schedule. The second part, entitled "AHS System Objectives and Characteristics," contains the system performance and design targets, measures of effectiveness and measures of performance. These will be used to guide the requirements, specifications, constraints and cri-

teria for design, prototyping, testing and ultimate AHS system deployment.

Milestone 1 benefited by substantial critique and feedback by NAHSC Associate Participants and other members of stakeholder groups. With the input incorporated, the final document was issued November 3, 1995. ■



As the key staff members of the NAHSC look on, Program Manager Jim Rillings hands the Milestone 1 document to Dick Bishop, of the FHWA.

More Than 200 Attend the Second NAHSC Workshop

October 18-20, 1995, San Diego, CA

The second in a series of NAHSC Workshops was held October 19 and 20 in San Diego. The System Concepts Workshop was a continuation of NAHSC outreach to the transportation community to build national consensus on the AHS program. Sponsored jointly by ITS America and the California Alliance for Advanced Transportation Systems (CAATS), more than 200 representatives from industry, state Departments of Transportation, metropolitan and local transportation agencies, environmental organizations, universities and transportation users attended.

The NAHSC's System Concepts Workshop provided attendees with an overview of the program status, AHS system objectives and the initial set of AHS concept families. Much like the one held in April in Ft. Lauderdale,

Florida, the workshop included interactive sessions on AHS system requirements and concept development. The attendees were asked to explore and evaluate each of the initial concept families from the perspective of different stakeholders and provide detailed feedback to the Consortium.

The six concept "families" were derived from AHS operations and design concepts conceived, in part, from a review of the Precursor Systems Analyses, NAHSC concepts, and from responses received from a national solicitation for AHS concepts. Based on input provided by stakeholders at the San Diego workshop, the Consortium refined the concepts to five families and plans to select three specific concepts by the end of 1996 for further evaluation and analysis. ■

NAHSC Profile: Gene McCormick

Chairman, NAHSC Program Management Oversight Committee (PMOC)

Gene McCormick may be new in the driver's seat as chairman of the NAHSC Program Management Oversight Committee (PMOC), but he's been behind the wheel, steering the transportation industry toward safer, smarter highways for 31 years. He succeeds Bill Spreitzer of General Motors as PMOC chairman.

A civil engineer, Gene points out the essential role of highways and the importance of state-of-the-art highway technology. "Highways are key to our economic future—making it a necessity to create and apply innovative transportation solutions, like the AHS, to the ever-increasing demands of the U.S. highway systems."

Gene has held influential positions in the public sector. As deputy administrator for the Federal Highway Administration, not only was he responsible for operations of its \$18 billion annual budget and providing policy guidance to the agency, he was also involved in developing the legislative framework of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) which created the federal program for Intelligent Transportation Systems (ITS) and the extension of ITS technologies—the AHS. Gene served, too, as Illinois Deputy Secretary of Transportation and transportation advisor to Saudi Arabia's Ministry of Communications.

Nearly three years ago, he joined Parsons Brinckerhoff (PB), the 110 year-old New York-based Core Participant representing transportation infra-

structure and systems engineering on the NAHSC. At PB, he is the program area manager for highways, director of strategic marketing and a senior vice president.



Gene McCormick

Position: Program Management Oversight Committee (PMOC) Chairman

Office: Washington, D.C.

Place of Birth: Lafayette, Indiana

Education: B.S., Civil Eng., Tri-State University, Angola, Indiana; M.A., Public Administration, Sagamon State University, Springfield, Illinois

Family: Wife Charlotte; Son Jon, who lives near Boston

Home: Arlington, Virginia

Gene is glad to be involved with the NAHSC. "AHS will improve safety, alleviate congestion, enhance driver comfort and provide greater productivity and efficiency on our nation's highways," he explains. "These goals can be achieved through the work of the NAHSC. The Consortium mechanism offers a unique opportunity to integrate technology to improve our highway operations through a broad public/private partnership. Linking vehicle, roadway and driver technologies into an integrated system will effectively lead us into our next era of transportation."

In addition, Gene holds posts in many professional organizations including chairman of the board of directors on the Highway Advisory Council of the American Road and Transportation Builders Association; chairman of the Transportation Committee of the American Consulting Engineers Council; and member of the National Transportation Policy Committee of the American Society of Civil Engineers.

Based in Washington, D.C., Gene is plugged in to legislative and other developments affecting the future of highways. If you want to get up to speed on what's happening in highways, Gene is the person to ask. ■

NAHSC APPOINTMENTS

- Lee F. Deter has been elected the chairman of the NAHSC Policy Steering Board (PSB). He brings to the NAHSC more than 20 years of experience and an in-depth knowledge of transportation studies. Lee has served as the chief of the Caltrans' Office of Traffic Improvement, Division of Mass Transportation, and the Development and Management Division of Aeronautics. Currently, Lee is the deputy director for Caltrans Maintenance and Operations. In addition, he is responsible for the Caltrans Traffic Operations and New Technology Research.
- Jeff Owens, executive director of Delco Electronics Emerging Products & Systems Global Product Unit, has been elected vice chairman of the NAHSC Policy Steering Board (PSB).
- Hamed Benouar has been named as the new Caltrans program manager in the NAHSC Program Manager's Council (PMC). He brings to the NAHSC more than 12 years of public and private management and engineering experience.

Currently, Hamed is the Caltrans manager for the Automated Highway Maintenance and Construction Technology Program, liaison between Caltrans and the University of California PATH Program and interim program manager for the National ITS Architecture Development Program.

Newsbrief

- In late November the NAHSC was featured in a two-minute Fox Business News national feed that was broadcast by more than seven major Fox Network affiliates. The audience was estimated at greater than four million viewers. Computer generated-graphics were used to illustrate and describe the automated highway system as a solution to the growing traffic congestion problems in the U.S. In addition, an NAHSC spokeswoman described how vehicles equipped for the AHS might offer many features such as entertainment, communications equipment and conversation-conductive seating.
- The pros and cons of an automated highway system were discussed in two articles that appeared in the *Detroit News* and the *Chicago Tribune* in mid-October.
- Placement in ITS-related publications included articles in *Inside ITS*, *ITS America News*, and *ITS World*. These publications covered Consortium news such as the seven concept contract awards, Associate Participants program, World Wide Web site establishment and the System Concepts Workshop.
- Efforts for placement in Core and Associate Participant publications gained a foothold with the *Bechtel Globe* feature of the corporation's involvement with the NAHSC project. The two-page article featured perspectives and photos of Bechtel PMC member Joe Perkowski and NAHSC Business Manager Kurt Goddard, also of Bechtel.
- NBC-TV aired a five-minute segment detailing AHS technology as the first segment in a one-hour, prime-time program entitled "Amazing Things to Come." The AHS segment featured the AHS-equipped Buick XP2000 concept car and BRW computer-generated graphics illustrating what an AHS might look like. ■

Visit the NAHSC home page at: <http://web1.volpe.dot.gov/nahsc/>

Make this a bookmark and check our web site regularly—more information is going on-line everyday!

Network

- During Secretary of Transportation Peña's visit to Detroit, in October, he met with the NAHSC Policy Steering Board (PSB) to review the progress of the Program and discuss future plans. Program Manager Jim Rillings described the meeting as upbeat, adding, "During the meeting we enjoyed productive two-way communications between Secretary Peña and the PSB."
- The California Alliance for Advanced Transportation Systems (CAATS) first annual conference was held on November 29 and 30 in Newport Beach, California. More than 30 people attended the AHS sessions, which featured presentations by the NAHSC program manager and other key task leaders.
- The second ITS World Congress was held in Yokohama, Japan on November 9-11, 1995. Four different Japanese automobile manufacturers in conjunction with ITS World Congress demonstrated an automated highway system concept on a test-track utilizing different technologies. Several NAHSC key staff including Terry Quinlan the test and demonstration manager, and the Outreach Task Leader Don Orne, were among the participants. ■

More Associate Participants Sign On

In the first year of the NAHSC program, a second tier of NAHSC participation was formed to formalize the stakeholder feedback process to ensure that the best plan for automated highway systems can be developed. Associate Participants, as the group of stakeholders and technical leaders are called, represent the wide variety of AHS stakeholder categories — vehicle electronics manufacturers, highway designers, state and local governments, trucking and transit operators, the insurance industry, environmental interests and highway users.

In recent months, 15 additional Associate Participants were added to the Consortium's list, bringing the total number to 49. In addition, several applications are awaiting approval by the Program Management Oversight Committee (PMOC) in January.

Below, is the list of the new Associate Participants:

- Maricopa County, Arizona
- San Diego Association of Governments
- I-95 Corridor Coalition
- Aisin Seiki Co., Ltd.
- California Highway Patrol
- University of Wisconsin at Madison
- University of Massachusetts Transportation Center
- Air Force Development Test Center (AFDTC)
- American GNC Corp.
- American Association of State and Highway Transportation Officials (AASHTO)
- Public Technology, Inc.
- QST Electronics, Inc.
- ITS Institute, University of Minnesota
- Shell Oil Products Company
- Calspan SRL Corporation

AHS Calendar of Events

Date	Location	Event
January 7-11, 1996	Washington, DC	Transportation Research Board (TRB) Annual Meeting
April 15-18, 1996	Houston, TX	ITS America, Sixth Annual Meeting
October 14-18, 1996	Orlando, FL	ITS World Congress
August 1997	San Diego, CA	Test Track Demonstration

To have your name added to the mailing list, please fax to (810) 649-9569

Name _____ Organization _____
 Address _____ AHS Areas of Interest: _____
 Phone _____
 Fax _____

Are you a member of one of the stakeholder groups?

- | | | |
|--|---|---|
| <input type="checkbox"/> Vehicle Industry | <input type="checkbox"/> Vehicle Electronics Industry | <input type="checkbox"/> Transportation Users |
| <input type="checkbox"/> State Government Agency | <input type="checkbox"/> Environmental Interests | <input type="checkbox"/> Insurance Industry |
| <input type="checkbox"/> Local Government Agency | <input type="checkbox"/> Trucking Operators | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> Highway Design Industry | <input type="checkbox"/> Transit Operators | |

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NAHSC Core Participants

- **Bechtel**
(Transportation design and construction representative)
- **Caltrans (California Department of Transportation)**
(State/regional/metropolitan transportation agencies representative)
- **Carnegie Mellon University**
(Center for research on machine/vehicle intelligence)
- **Delco Electronics**
(Vehicle electronics industry representative)
- **General Motors**
(Vehicle industry representative)
- **Hughes Aircraft**
(Aerospace systems industry representative)
- **Lockheed Martin**
(Aerospace/electronics systems industry representative)
- **Parsons Brinckerhoff**
(Transportation infrastructure and systems engineering representative)
- **The University of California PATH Program**
(Leading AHS research group in the U.S.)

*In partnership with the
 United States
 Department of Transportation,
 Federal Highway Administration*

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- EDITOR:
Habib Shamskhov
- ASSOCIATE EDITOR:
Faraz Angha
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How the Systems Engineering Team and the Technical Director Coordinate AHS Technical Efforts

All work done by the National Automated Highway System Consortium (NAHSC) toward the goal to define, demonstrate and build a prototype AHS system is defined and structured in the program's work breakdown structure (often referred to as "WBS"). Identified alphanumerically, the WBS describes the tasks to be accomplished, their schedule and their relationship with other NAHSC tasks. These tasks are accomplished by teams, whose leaders and members come from the Consortium's Core Participant organizations. This approach enables Core Participants to apply their expertise to the appropriate areas.

However, substantial cross-team integration is necessary to coordinate activities, address all program aspects and avoid duplication of efforts. This is partially accomplished by periodic Program Manager's Council (PMC) meetings and coordination among team leaders. Additional glue to hold the Consortium's technical efforts together comes from the technical director and the Program Office's Systems Engineering Team (POSET).

The Technical Director and POSET help ensure the efficiency, accuracy and objectivity of NAHSC activities and provide overall system integration. POSET members include Ron Colgin of Hughes, Terry Quinlan of the California Department of Transportation (Caltrans), Bob Smilgis of Bechtel, Tommy Viner of Lockheed Martin, and a to-be-named Parsons Brinckerhoff member. NAHSC

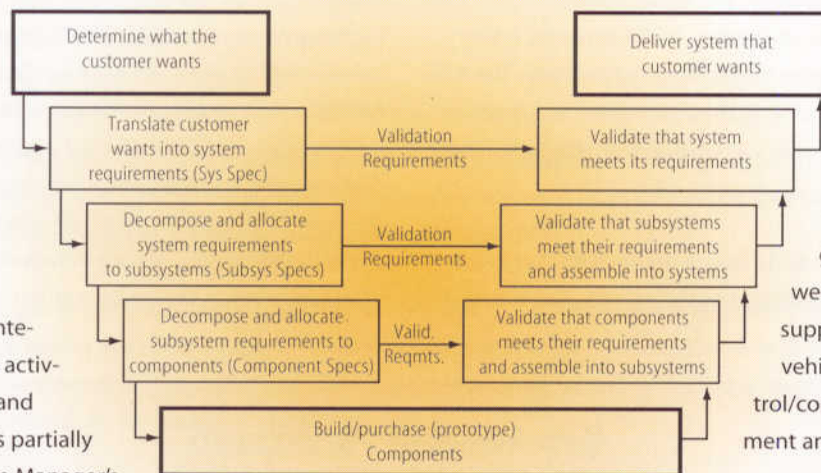
Technical Director Bill Stevens, of the University of California at Berkeley PATH Program, provides guidance to POSET.

Overall, POSET provides structure and methods for conducting the Consortium's technical activities; supplies technical and integration support to the Consortium's task teams; and will manage the testing and validation of the

and manages periodic technical interchange meetings that allow the Core Participants' AHS staff to share work in progress and exchange ideas. POSET also coordinates the AHS interactions with the Intelligent Transportation System national architecture development. Moreover, POSET forms senior advisory "tiger teams" to address particularly tough problems; these special teams may include senior person-

nel from outside of the Consortium.

In addition, the systems engineers support each NAHSC task team. They assist task team leaders in cross-team integration and risk management as well as provide system integration support in roadway engineering, vehicle engineering, command/control/communications, traffic management and experimentation.



The System Engineering Process Model

Automated Highway System (AHS) prototype when built in 2002.

To accomplish these objectives, POSET has developed the NAHSC's Program Management Plan, the Systems Engineering Plan, the Program Notebook and the Risk Management Plan. In addition, POSET reviews Statements of Work for the Program's tasks.

POSET has several duties that cut across task teams, such as overseeing the Program's requirements, development activities and case study coordination. In addition, it sponsors

Recently, POSET has been coordinating the NAHSC's development of AHS requirements. This involves the development of cutting-edge functional and performance requirements and the AHS interface diagram. These efforts form the foundation for continuous development of AHS requirements. POSET has also developed a technology roadmap that will guide the Consortium's technology investment and has integrated electronic actuators onto vehicles to be used in the Proof-of-Technical-Feasibility Demonstration slated for August of 1997 in San Diego. ■

NAHSC Profile: **Bill Stevens, Technical Director**

The Path to Setting Up an Automated Highway System

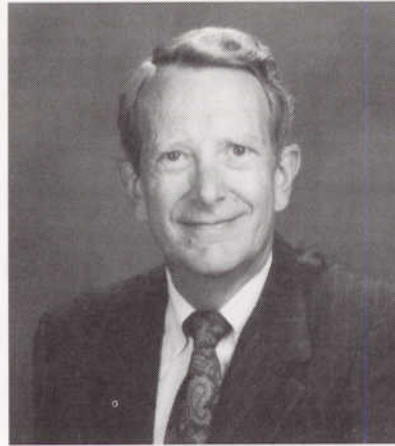
As technical director of the National Automated Highway System Consortium (NAHSC), Bill is coordinating the technical efforts of this ten-member consortium.

Bill believes in the AHS's importance. "Our country's highway system is expected to continue as the main transportation mode through the middle of the 21st century," he says. "It's becoming increasingly congested and some 40,000 people a year die in highway accidents. With the efficiency of AHS, there will be less congestion and safer roads." Highway automation, he notes, will also improve commercial shipping and enhance transit systems.

Bill, who has published numerous papers on automated vehicle control, became the NAHSC technical director this past January, when he joined the University of California at Berkeley PATH (Partners for Advanced Transit and Highways) Program, one of the Consortium's Core Participants.

Since automated vehicle control is a new technology, designing the plan for AHS deployment poses certain challenges. As Bill explains: "A key challenge will be integrating the new technologies into society. The AHS project also requires cooperation among the automakers and highway agencies. That is why a consortium, in partnership with the government [USDOT] is necessary."

Bill's role in the NAHSC keeps him quite busy, working with numerous technical teams from the various member organizations. He's based in



Bill Stevens

Position: Technical Director

Office: Troy, Michigan

Education: B.S., Electrical Engineering; B.S., Business Administration, University of Colorado

Family: Wife Renee; and Sons Randall, Keneth and Will

Home: Bethesda, Maryland

Hobbies and Interests: Astronomy, tennis, jazz, and reading murder mysteries

the NAHSC Program Office in Troy, Michigan, and also works out of his home in Bethesda, Maryland.

Bill first got involved with AHS while working for the MITRE Corporation, a non-profit systems engineering organization that works primarily with federal agencies. Bill was responsible for MITRE's support to the Federal Highway Administration's AHS Program. In that role he provided technical oversight of the AHS Precursor Systems Analyses. Previously, at MITRE, he was responsible on projects for the U.S. Department of Defense and provided technical support to the Urban Mass Transit Administration on the Advanced Group Rapid Transit Project. Earlier at the Control Data Corporation, Bill was systems engineering manager for the Washington, D.C., Metro's automated fare collection system. "That's where my work in the transportation field began," he says. ■

New Associate Participants

The number of NAHSC Associate and Outreach Participants now exceeds 90 organizations with new participants signing up each month. Each participant has been assigned a core member contact whose responsibility is to ensure response to Participants' needs and inquiries. Sompol Chatusripitak is the Participant contact coordinator. He can be reached at (301) 998-6620.

Recently signed NAHSC Associate Participants:

- Automobile Club of Southern California
- Army Tank Automotive Armaments Command (TACOM)
- Aleman & Associates, INC.
- CDW Consultants, Inc.
- Digital Systems
- Geri Inc.
- Harvard Design and Mapping Company, Inc.
- Haugen Associates
- HP Microsystems Inc.
- Louisiana State University
- Michigan State University
- Minagar & Associates
- National Private Truck Council
- NJ Transit Corporation
- Roper and Associates, Inc.
- Ruan Transportation Management Systems
- SAE International
- San Diego Regional Transportation Technology Alliance (RTTA)
- South Coast Air Quality Management District
- Technology Management, Inc.

Mark Your Calendar and Plan to Join Us At the Second AHS Stakeholder Forum

May 29-31, 1996 at the Harborside Hyatt in Boston, Massachusetts

All AHS stakeholders are invited to participate in the Second AHS Stakeholder Forum scheduled for the end of May. This forum is a part of the NAHSC's continuing effort to involve Associate and Outreach Participants and stakeholders in all levels of activities, beginning with representation on the NAHSC Program Management Oversight Committee (PMOC). Forum participants will have the opportunity to meet and caucus with those who share interests and needs, select representatives to be members of the PMOC and to help extend the depth of NAHSC's stakeholder programs. Moreover, participants will discover additional opportunities to become involved in a wide range of NAHSC program areas, including case studies, technology and concept development and the Proof-of-Technical-Feasibility Demonstration.

In little more than a year of existence, the NAHSC has enjoyed considerable support and contributions by a broad base of Associate and Outreach Participants representing key stakeholder groups nationwide. Large attendance numbers at the first AHS Stakeholder Forum, the two

workshops and various technical sessions attest to the importance and the enrichment stakeholders have brought to the Program-and the likelihood of continued support. Many stakeholders have also contracted with the NAHSC to provide critical technical analyses and services. It is the NAHSC management's goal to elevate stakeholder participation to the PMOC level. The Second AHS Stakeholder Forum is designed to achieve that goal.

To ensure stakeholder perspective, the NAHSC encourages all stakeholders to participate in the planning, organizing and implementation of the Second AHS Stakeholder Forum. Please contact Steve Carlton at (202) 646-2089 for more information or fax your request for registration packet to (810) 643-6511. Please include your name, organization, mailing address, phone & fax numbers on your faxed request.

Meanwhile, make sure you mark your calendar and plan to join us at the Second AHS Stakeholder Forum in Boston. ■

Network

- Dr. Steve Shladover, task leader of the AHS system configuration downselection, recently announced opportunities for participation in a series of activities ranging from human factors analysis to concept downselection. Associate and Outreach Participants are encouraged to contribute to these activities. Interested stakeholders should contact Dr. Shladover at (510) 231-9537.
- Walt Faulconer, NAHSC Site Manager at Lockheed Martin, provided an overview of the AHS Program and the mission of the NAHSC to the Rocky Mountain Chapter of ITS America during their first annual conference held in late February in Colorado Springs. In his keynote speech, Faulconer highlighted the AHS Program's involvement in the region and participation opportunities within the Consortium. He also provided an overview of the AHS mini-demo conducted on Colorado Highway 121 last September.
- The NAHSC is sponsoring a booth at the ITS America Sixth Annual Meeting and Exposition. Located next to U.S. DOT's booth (#242), the AHS booth features information about the Consortium, participation opportunities and also information about the AHS-Configured Buick concept car, the XP 2000.

Newsbrief

- *Wired* magazine featured a six-page article about AHS in their February issue, describing the NAHSC mission and the AHS concept.
- Several national television network affiliates, including WSAV-TV in Savannah, Georgia, and WHP-TV in Harrisburg, Pennsylvania, broadcast feature stories about AHS and the NAHSC mission.
- *Car and Driver* magazine ran a feature story detailing ITS and AHS technologies in their February issue. The story discussed the pros and cons of several types of technologies, delving into subjects such as system liability and projected costs of implementation.

AHS Update is a quarterly publication of the National Automated Highway System Consortium.

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AHS Calendar of Events

Date	Location	Event
April 15-18, 1996	Houston, TX	ITS America, Sixth Annual Meeting, and Exposition
May 5-9, 1996	Kansas City, MO	APTA, Bus Operations, Technology and Management Conference
August 5-9, 1996	Vancouver, Canada	SAE, Future Transportation Technology Conference and Exposition
September 15-18, 1996	Minneapolis, MN	ITE Meeting & Expo
September 18-21, 1996	St. Louis, MO	AMPO, Association of Metropolitan Planning Organization, Fifth National Conference, "Pathways to the 21st Century"
October 6-10, 1996	Anaheim, CA	APTA, Expo '96 and Annual Meeting
October 14-18, 1996	Orlando, FL	ITS World Congress
August 1997	San Diego, CA	Test Track Demonstration

To have your name added to the mailing list, please fax to (810) 649-9569

Name _____ Organization _____
 Address _____ AHS Areas of Interest: _____

 Phone _____
 Fax _____

Are you a member of one of the stakeholder groups? Please indicate one:

- | | | |
|--|---|---|
| <input type="checkbox"/> Vehicle Industry | <input type="checkbox"/> Vehicle Electronics Industry | <input type="checkbox"/> Transportation Users |
| <input type="checkbox"/> State Government Agency | <input type="checkbox"/> Environmental Interests | <input type="checkbox"/> Insurance Industry |
| <input type="checkbox"/> Local Government Agency | <input type="checkbox"/> Trucking Operators | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> Highway Design Industry | <input type="checkbox"/> Transit Operators | |

NAHSC Core Participants

- **Bechtel**
(Transportation design and construction representative)
- **Caltrans (California Department of Transportation)**
(State/regional/metropolitan transportation agencies representative)
- **Carnegie Mellon University**
(Center for research on machine/vehicle intelligence)
- **Delco Electronics**
(Vehicle electronics industry representative)
- **General Motors**
(Vehicle industry representative)
- **Hughes Aircraft**
(Aerospace systems industry representative)
- **Lockheed Martin**
(Aerospace/electronics systems industry representative)
- **Parsons Brinckerhoff**
(Transportation infrastructure and systems engineering representative)
- **The University of California PATH Program**
(Leading AHS research group in the U.S.)

In partnership with the
United States
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 Federal Highway Administration

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AHS Stakeholders Gather, Organize at NAHSC Forum

The second AHS Stakeholder Forum was held in Boston, on May 30 and 31. More than 100 attendees met to further define AHS stakeholder categories and to organize representation from each category on the NAHSC Program Management Oversight Committee (PMOC). Members of each category established plans to maintain ongoing participation with the NAHSC and considered various opportunities for participation in the Consortium task-level work. In addition, attendees provided insights and ideas regarding ongoing Consortium activities to assess potential AHS concepts and demonstrate AHS technologies. The NAHSC and AHS stakeholders intend to sustain these and other vital interactions during the process of specifying, prototyping and demonstrating an AHS that reflects a national consensus.

Following introductory remarks by Forum host Gene McCormick (PMOC Chairman), George Ostensen, USDOT PMOC Representative, gave the federal perspective, and Program Manager Jim Rillings gave a Consortium progress report. Then it was time for the forum attendees to engage in the important work of organizing their stakeholder categories. Results yielded the selection of the following individuals as PMOC representatives:

- State DOT's, MPOs and Other Agencies: J.R. Robinson, American Association of State Highway and Transportation Officials (AASHTO)
- Highway Industry: John Mason, Penn State University
- Commercial Vehicles and Trucking: Bill Rodgers, American Trucking Association (ATA)
- Transit Industry: Robert MacLennan, American Public Transit Association (APTA)
- Vehicle Industry: Bill Agnew, Society of Automotive Engineers (SAE)

- Electronics Industry: John McComas, Delco Electronics (Interim)
- Transportation Users: Craig Roberts, Intelligent Transportation Society of America (Interim)

Under the leadership of their selected PMOC Representative, the stakeholder category members established and prioritized an initial list of advantages and concerns about AHS and provided specific feedback on concept development and '97 Demonstration questions posed by the NAHSC task teams.



George Ostensen, addresses attendees of NAHSC Stakeholder Forum; Gene McCormick (center) and Jim Rillings (right) guided the proceedings.

Achieving Consortium goals for AHS development depends on establishing a solid national consensus. The NAHSC is encouraged by stakeholder participation and commitments shown at the Forum and is committed to supporting expansion of stakeholder category membership and an ongoing and produc-

ive engagement throughout the NAHSC process. (See page 2, "Forum Follow-up") ■

NAHSC Workshop #3

Comparisons of Automated Highway System Concepts – Set for September 18-20, in Minneapolis

The dates and location for the next workshop are September 18, 19 and 20 at the Sheraton MetroDome in Minneapolis, Minnesota. To receive your registration packet, fax or e-mail your request with your name, organization, mailing and e-mail address, phone and fax numbers to the National Automated Highway System Consortium (NAHSC) Program Office in Troy, Michigan; fax: (810) 643-6511 or e-mail: scholank@nahs.org. The interim findings of the NAHSC task team's concept studies will be presented for discussion by the stakeholders so that the NAHSC can better understand stakeholder preferences regarding AHS development and deployment alternatives. ■

NAHSC Profile: Terry Quinlan

NAHSC Test and Demonstration Manager

From her position as a senior electronics engineer and chief of Caltrans Advanced Vehicle Control and Automated Systems, Terry Quinlan brings the right mix of highway operation and vehicle control experience to fill the position of the Consortium's test and demonstration manager. As part of the NAHSC Program Office System Engineering staff, the Test and Demonstration manager is responsible for ensuring that all Consortium tests and demonstrations are safe and successful with particular emphasis on the congressionally-mandated 1997 Proof-of-Technical-Feasibility Demonstration and final AHS prototype testing.

Terry explains her role as a member of the System Engineering staff, "...the success of our test and demonstration task is dependent on our ability to integrate all appropriate program elements, such as technology and tool development, concept configuration, societal and institutional studies, and outreach findings in every test and demonstration we perform. Equally important is the successful integration of test and demonstration results back into the AHS Program. My assignment, as part of the System Engineering staff, offers the challenge to provide the perspective needed for this integration."

Terry has been involved in numerous highway development and



Terry Quinlan

Position: Test and Demonstration Manager

Office: Troy, Michigan; satellite office in San Diego, through August 1997

Place of Birth: Willimantic, Connecticut

Education: Bachelors degree in Electrical & Electronic Engineering, University of California Sacramento

Family: Husband Rich; son Patrick, and daughter April

Home: Northern California since 1969

demonstration activities since joining Caltrans in 1988. She developed the prototype Advanced Transportation Controller (ATC), a modular real-time multipurpose control computer for highway operations (now the State of California model 2070 Standard Specification). She was the project engineer directly responsible for several ATC demonstrations including Automated Weigh-In-Motion for commercial vehicle operations on Interstate 80 in Sacramento, California and Adaptive Freeway Ramp

Metering Supervisory Control on U.S. Interstate 50, also in Sacramento. Terry also brings to the program experience in automatic vehicle identification and electronic toll collection systems; roadway-to-vehicle communication and motorist information systems; roadside safety crash testing; quality assurance and materials testing of electrical and electronic components and systems and a variety of other highway instrumentation applications.

Terry is pleased to be involved with the AHS Program and is excited about the opportunity to work with all the stakeholder groups. "The stakeholders really hold the key to the success of AHS," Terry explains. "If we find a way to meet their needs and help them realize the true benefits of AHS, we're well on our way to achieving success — that is, achieving increased mobility, safety and environmental quality in highway transportation." ■

Forum Follow-up

Liaisons and Key Issues Report

With the Stakeholder Forum and the stakeholder group formation completed, the NAHSC is now poised to move on to the next stage of stakeholder relations. Not only did the Forum reach its goal of facilitating stakeholder caucuses, it also generated a tremendous amount of energy and enthusiasm among participants — far beyond most expectations. The NAHSC will build on these results and begin a series of actions to assure stakeholder participation in the Consortium's Program.

To cement these relationships, plans are well underway to appoint liaisons from each stakeholder group to facilitate caucuses, act as information conduits, support broadening of stakeholder group

participation and assisting with group leadership transfer.

In July, a full summary of key issues was distributed to all attendees, along with a schedule of follow-up materials. This will be followed by a response and action plan addressing key issues by Consortium task leaders and management. The report will set a course of actions to identify task owners and expected results. By August 1996, the NAHSC will report to stakeholders the results of actions taken. Although some issues may be ongoing, the second Stakeholder Forum will be officially completed. By then, the NAHSC Workshop #3 will take place and another cycle of stakeholder involvement will begin. ■

Consortium's Demonstration Team Celebrates a Site Preparation Kick-off Ceremony at High Noon on June 28

Guests enjoy festivities while learning about the NAHSC's plans for August 1997

The National AHS Consortium commemorated the start of site preparation and construction activities for the 1997 Proof-of-Technical-Feasibility Demonstration slated for August 1997 with a kick-off ceremony held on the north end of the Interstate 15 express lanes in San Diego County on June 28, 1996.

The mid-day event coincided with and celebrated the 40th anniversary of President Eisenhower's signing of the Federal-Aid Highway Act (signed June 29, 1956), which created the U.S. interstate highway system. It also marked the beginning of what promises to be the next major upgrade to the U.S. interstate highway system — the automated highway.

Dean Dunphy, California Secretary of Business, Transportation & Housing; Julie Cirillo,

Federal Highway Administration (FHWA) regional director; Ed Mertz, general manager of Buick Motor Division; Robert H. Nida, vice president of the Automobile Club of Southern California; San Diego District 75 Assemblyman Jan Goldsmith and Gary Gallegos, Caltrans District 11 director, provided details and insights about the upcoming demonstration and what AHS will mean to the future of U.S. transportation.

Attendees included executives and staff of the NAHSC Core Participant

organizations and representatives from the NAHSC Associate and Outreach Participant organizations as well as academicians, state government and AHS stakeholder group representatives. In addition, local officials, industry leaders and members of the local community served by I-15 joined in the festivities. General, business and trade media were on hand, providing print and broadcast coverage.

To highlight the timely event theme, 1956 and 1996-model vehicles and

Buick's XP-2000 AHS concept car were displayed near the speaker's podium. Instead of the traditional silver-shovel groundbreaking ceremony, silver high-strength ceramic magnets, necessary for specific types of automated vehicle control, were installed in the pavement by the event speakers and special guests.



Dean Dunphy, California Secretary of Business, Transportation & Housing

The kick-off ceremony and luncheon came together because of special efforts by Consortium Core and Associate Participants such as Caltrans District 11, District 7 and Central Office, Buick Motor Division of General Motors, the California Highway Patrol, AAA of Southern California, the San Diego Automotive Museum, the RTTA, SANDAG and Parsons Brinckerhoff's San Diego office. Thanks to all who participated — and get set to see the AHS technologies in action next year! ■

Newsbrief

■ AHS technologies, the Consortium and its Core Participants were featured in newspaper, magazine, TV and radio broadcasts and cable television. A "short list" of these media:

- CNN Science & Technology Week
- BBC Radio
- The Economist magazine
- PBS "America on Wheels" series
- Los Angeles magazine
- San Francisco Chronicle
- WSLs-TV, Roanoke, Va.
- TV Ontario
- San Diego Union-Tribune
- Technopolitics (syndicated PBS)
- Los Angeles Times
- KFMB-TV (CBS), San Diego

Recently, the Discovery Channel's "Next Step" filmed a feature segment of the PATH test vehicles and corresponding AHS technologies. Look for details the next issue of *AHS Update* for broadcast information.

AHS Update is a quarterly publication of the National Automated Highway System Consortium.

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AHS Calendar of Events

Date	Location	Event
August 5-9, 1996	Vancouver, Canada	Society of Automotive Engineers (SAE), Future Transportation Technology Conference and Exposition
September 15-18, 1996	Minneapolis, MN	Institute of Transportation Engineers (ITE) Annual Meeting & Expo
September 18-20, 1996	Minneapolis, MN	National AHS Consortium (NAHSC) Comparisons of Automated Highway System Concepts - (Workshop #3)
October 6-10, 1996	Anaheim, CA	American Public Transit Association (APTA), Expo '96 and Annual Meeting
October 14-18, 1996	Orlando, FL	3rd Annual Intelligent Transportation Systems (ITS) World Congress
August, 1997	San Diego, CA	AHS Technical Feasibility Demonstration

To have your name added to the mailing list, please fax this to (810) 649-9569

Name _____ Organization _____
 Address _____ AHS Areas of Interest: _____

 Phone _____
 Fax _____

Are you a member of one of the stakeholder groups? Please indicate one:

- | | | |
|--|---|---|
| <input type="checkbox"/> Vehicle Industry | <input type="checkbox"/> Vehicle Electronics Industry | <input type="checkbox"/> Transportation Users |
| <input type="checkbox"/> State Government Agency | <input type="checkbox"/> Environmental Interests | <input type="checkbox"/> Insurance Industry |
| <input type="checkbox"/> Local Government Agency | <input type="checkbox"/> Trucking Operators | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> Highway Design Industry | <input type="checkbox"/> Transit Operators | |

NAHSC Core Participants

- **Bechtel**
(Transportation design and construction representative)
- **Caltrans (California Department of Transportation)**
(State/regional/metropolitan transportation agencies representative)
- **Carnegie Mellon University**
(Center for research on machine/vehicle intelligence)
- **Delco Electronics**
(Vehicle electronics industry representative)
- **General Motors**
(Vehicle industry representative)
- **Hughes**
(Aerospace systems industry representative)
- **Lockheed Martin**
(Aerospace/electronics systems industry representative)
- **Parsons Brinckerhoff**
(Transportation infrastructure and systems engineering representative)
- **The University of California PATH Program**
(Leading AHS research group in the U.S.)

In partnership with the
 United States
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 Federal Highway Administration

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National AHS Consortium Presents Vision of 21st Century Automated Highway System at Third Annual ITS World Congress

The National Automated Highway System Consortium (NAHSC) provided a peek into the future of highway travel at the Third Annual Intelligent Transportation Systems (ITS) World Congress, held October 14-18, 1996, at the Orange County Convention Center in Orlando. Automated highway simulators, demonstration vehicles, concept cars and interactive multi-media presentations gave attendees a detailed idea of how they might travel the highways in the 21st century.

ITS World Congress participants were able to experience travel on an automated highway system (AHS) through a high-fidelity driving simulator that featured a Silicon Graphics Onyx Rack System with Reality Engine II graphics, a five-channel directional sound system, a synchronized "road feel" motion platform built around a Saturn sedan - all contained within a mobile trailer. Developed by Battelle, an NAHSC Associate Participant, the interactive, hands-on/hands-off simulator allowed World Congress participants to experience AHS features such as check-in, automated travel, collision-avoidance and check-out in a safe and realistic environment.

Adjacent to the AHS simulator was the Carnegie Mellon University (CMU) demonstration car from which attendees were able to learn about vision-based automated driving. The CMU system uses a camera mounted on the windshield to monitor the road ahead and a computer to process the camera images. The system operates in two modes: In driver-assist mode, it will alert drowsy or inattentive drivers if they start to drift off the road. In automatic mode, it will control the vehicle's steering, keeping the vehicle in its lane. For stationary demonstration purposes, the system steered the vehicle in response to the videotaped scenes of roadways. This is an example of building-block technologies which have the potential to evolve into a fully automated highway system.

Nearby, the California Department of Transportation (Caltrans) and the University of California-Davis exhibited a safer, more efficient way highway departments will be able to perform debris removal in the near

future. Typically this type of maintenance can be a dangerous and inefficient operation but as the prototype Automated Litter Bag/Debris Collection Vehicle demonstrated, pickup of loads up to 100 pounds can be handled by the hydraulic clamshell-type pinch bucket more quickly, using only one worker who remains (safely) in the truck cab.

On display in the Consortium's booth was the Buick XP2000 AHS concept car. The car's sleek exterior sported labels pointing out the kinds and likely placement of components that will make automated highway travel possible. The innovative styling gave ITS World Congress attendees the chance to see what's in store for personal transportation in the 21st century.



Just to the side of the eye-catching XP2000 concept car was a kiosk where attendees selected from a range of AHS-specific information using an interactive computer presentation. They viewed slice-of-life vignettes depicting how AHS might enhance the quality of life for a variety of transportation users, got their frequently-asked questions answered or surfed the NAHSC web site on the Internet.

In addition, nine technical sessions on the world-wide development of AHS were presented during the ITS World Congress. Of the 41 technical papers that comprised these sessions, 16 were presented by members of the Consortium.

Two technical sessions were devoted entirely to the NAHSC Program: *Automated Highway Systems*, was held Tuesday, October 15 and *Automated Highway Systems in the United States*, was held Thursday, October 17.

Additional information about the Consortium, the range of AHS technologies and the National AHS Consortium Technical Feasibility Demonstration set for San Diego next August was forwarded to visitors at the NAHSC-sponsored booth and at identified Consortium Core and Associate Participant booths at the Exposition. ■

NAHSC Profile: **Steven E. Shladover**

NAHSC Site Manager, The University of California PATH Program

Steve Shladover is the site program manager for the NAHSC work at the University of California PATH Program, where he also serves as the deputy director and AVCS program manager. He has been leading PATH's research on AVCS issues, AHS in particular, since 1989.

Steve has been working on AHS and related transportation automation issues since his days as a graduate student at MIT in the early 1970s. He was attracted to research on these topics because of the opportunity to apply control technology to help solve pressing transportation problems. This dual interest in technology and transportation applications was reflected in his dual-major doctoral studies in control engineering and transportation systems planning. His masters and doctoral theses both addressed the automation of vehicle control systems for personal rapid transit and dual-mode transit vehicles (the AHS equivalents in the 1970s). For Steve, one of the most exciting things about working on the AHS program now is the opportunity to turn the theories and ideas of those student days into reality on test and demonstration vehicles.

After leaving MIT in 1978, Steve moved to California to work for Systems Control, Inc. and Systems Control Technology, Inc. for the next eleven years. While there, he led diverse projects in rail vehicle dynamics, rail-



Steven E. Shladover

Position: NAHSC site manager; deputy director University of California PATH Program

Office: Richmond, CA

Place of Birth: New York City

Education: S.B. in Mechanical Engineering, MIT (1972); S.M. in Mechanical Engineering, MIT (1974); Sc.D. in Mechanical Engineering, MIT (1978)

Home: Palo Alto, California

road system operations, transportation system management, computer-aided control engineering and the development of roadway-powered electric vehicles. The latter project involved him in the founding of the PATH Program in 1986, which led to his participation in the formation of Mobility 2000, the predecessor to ITS America. From the start of PATH, his attention has been refocused on the development of the automated highway system. He also has a strong personal motivation to want to see the AHS become a reality quickly, since his daily round-trip commute between home and office is nearly a hundred miles long. ■

Navigating The National AHS Consortium's Web Site:

<http://web1.volpe.dot.gov/nahsc>

The NAHSC Program Office has been working to design and populate a Consortium Web site. A renovated version of the web site has now been posted – the address is listed above and on most outreach materials. This site is linked to the Federal Highway Administration (FHWA) AHS and ITS web sites. The bar on the home page of the site labeled "AHS Home Page" and outlined in blue is the link to the other FHWA site.

The following is a brief explanation of the content of the five main topic headings on the NAHSC web site (information is already posted or will be in the near-term):

- **NAHSC Background and Mission:** General information about the history of NAHSC, the AHS concept, overview of tasks and roles and responsibilities
 - Welcome from the Program Manager
 - Mission Statement
 - NAHSC Vision
 - Organizational Chart
- **Consortium Participation:** Descriptions of Participant roles, invitation to join/contact information, list of participants, Core AHS/ITS overviews (eventually Associates, too)

- Introduction
- Core Participants list (on U.S. map), information and links
- Associate Participant list
- Outreach Participant list
- **Program Activities:** Task-specific information (B, C, D and E "legs") and schedules
 - Main Schedule
 - Systems Definition Schedule
 - Concept Development
 - Demo
 - Schedule
 - Lockheed Martin NAHSC Demo Page
 - AHS Prototypes schedule
- **What's New:** Round up of events and activities
 - Press Releases
 - Articles (where to find coverage of NAHSC/AHS and related information)
 - Newsletters (*AHS Update* current and back issues)
 - Upcoming Events
- **Workshops and Forums:** Announcements of upcoming workshops and forums and reports from past workshops and forums

The Third NAHSC Workshop Provides Greater Insight into the Challenges of AHS Development and Deployment – For Consortium and Stakeholders Alike

On September 19 and 20, the National AHS Consortium held its third technical workshop to review and discuss the development of AHS concepts. More than one hundred participants spent the two days in Minneapolis exploring alternative ways in which AHS could be developed and deployed. This workshop was designed to promote a two-way information exchange between the NAHSC researchers who have been analyzing AHS issues intently for the past year and the broader community of NAHSC Associate Participants and other AHS stakeholders.

The first morning of the workshop was devoted to background briefings about the progress we have made in defining AHS concept attributes

and in analyzing the effects of those attributes on throughput and travel times; safety; civil infrastructure costs; and societal, institutional, energy and environmental issues.

Afterward, the participants divided into four breakout sessions to review the results of the NAHSC work in these four areas in greater depth, reporting back to the full group on recommendations for alternative assumptions and further work.

On the second morning, the breakout groups discussed four of the most challenging topics that must be resolved in the selection of the preferred AHS implementation including operations and technology for automated driving mixed with manual traffic; infrastructure devel-

opment for dedicated lane operations; human factors and driver roles; standardization and local options.

The workshop concluded with a set of four parallel breakout discussions on the common topic of time-staging AHS deployment. There was great interest in the diverse ways in which AHS could be deployed for different applications.

The workshop provided the NAHSC researchers with an enhanced appreciation for the interests and concerns of the broader stakeholder community, while exposing that broader community to the richness and complexity of the issues that must be considered as we continue to develop a national AHS. ■

About Stakeholder Involvement in AHS Concept Definition Process...

The NAHSC concept definition process has been designed to include involvement of AHS stakeholders in a variety of ways. This is important to ensure that the AHS concepts are designed to address the needs of the diverse stakeholder communities and to obtain participation and improved understanding of AHS among stakeholders.

AHS is still a "young" program and many aspects of AHS are still being defined. It's unique to invite stakeholder participation at such an early stage of a program, when so many questions remain unanswered. Many of the questions that are of immediate interest to

the stakeholders cannot be answered until the AHS is defined much more explicitly than it is today and many other specifics cannot be answered about AHS to allow for local deployment conditions.

In spite of these challenges, there has been active stakeholder participation in two public workshops, several sets of focus groups and a stakeholder forum held last May. These activities have already yielded important inputs to the concept definition and evaluation process; the deletion of a sixth concept is an example of this. Further inputs will be sought during the coming years of concept development and

refinement, as we go through multiple iterations of our "spiral" development process. Stakeholder representatives on the Program Management Oversight Committee will be asked to review work in progress and participate in discussions of key concept definition issues. Their input will be combined with the technical evaluation results of the alternative AHS concept attributes to decide the direction for on-going AHS development. In summary, the stakeholder "voice" has been, and will continue to be sought and heard by the Consortium. ■

Newsbrief

■ AHS technologies, the Consortium and its Core Participants were featured in newspaper, magazine, TV and radio broadcasts and cable television. A "short list" of these media:

- *Roads and Bridges magazine*
- *Advanced Transportation Technology News*
- *The New York Times*
- *Flint (Michigan) Journal*
- *ITS International*
- *ITS Quarterly*
- *Geico Direct*
- *Local broadcast network affiliates in Sacramento, Los Angeles, San Francisco and Silver Springs, Maryland.*
- *Columbus (Ohio) Dispatch*
- *Toll Roads*
- *Civil Engineering News*
- *U.S. Auto Scene*
- *ITS World*
- *Governing magazine*
- *FHWA's Public Roads magazine*
- *Traffic Technology International*
- *Kiplinger's Personal Finance Magazine*
- *The Wall Street Journal*

AHS Update is a quarterly publication of the National Automated Highway System Consortium.

■ EXECUTIVE EDITOR:
Don Orne

■ MANAGING EDITOR:
Celeste Speier

■ EDITOR:
Faraz Angha

■ GRAPHIC ART:
Melinda Hodge



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AHS Calendar of Events

Date	Location	Event
January 11-16, 1997	Washington, D.C.	Transportation Research Board (TRB) Annual Meeting
January 22-23, 1997	Denver	C3 Team Meeting
February 5-6, 1997	Washington, D.C.	NAHSC/ITS America Joint Workshop on Liability Issues in Advanced Vehicle Control and Automated Highway Systems
February 10, 1997	San Diego	NAHSC Technical Feasibility Demonstration Team Meeting
February 11, 1997	San Diego	Demonstration '97 Technical Interchange Meeting
February 12-13, 1997	San Diego	Program Manager's Council Meeting #22
February 12-14, 1997	San Diego	Societal & Institutional Issues Team Meeting
June 5-6, 1997	Washington, D.C.	NAHSC Stakeholder Forum
August 7-10, 1997	San Diego	The National AHS Consortium Technical Feasibility Demonstration

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Name _____ Organization _____
 Address _____ AHS Areas of Interest: _____
 Phone _____
 Fax _____

Are you a member of one of the stakeholder groups? Please indicate one:

- | | | |
|--|---|---|
| <input type="checkbox"/> Vehicle Industry | <input type="checkbox"/> Vehicle Electronics Industry | <input type="checkbox"/> Transportation Users |
| <input type="checkbox"/> State Government Agency | <input type="checkbox"/> Environmental Interests | <input type="checkbox"/> Insurance Industry |
| <input type="checkbox"/> Local Government Agency | <input type="checkbox"/> Trucking Operators | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> Highway Design Industry | <input type="checkbox"/> Transit Operators | |

NAHSC Core Participants

- **Bechtel**
(Transportation design and construction representative)
- **Caltrans (California Department of Transportation)**
(State/regional/metropolitan transportation agencies representative)
- **Carnegie Mellon University**
(Center for research on machine/vehicle intelligence)
- **Delco Electronics**
(Vehicle electronics industry representative)
- **General Motors**
(Vehicle industry representative)
- **Hughes**
(Aerospace systems industry representative)
- **Lockheed Martin**
(Aerospace/electronics systems industry representative)
- **Parsons Brinckerhoff**
(Transportation infrastructure and systems engineering representative)
- **The University of California PATH Program**
(Leading AHS research group in the U.S.)

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Demonstration '97: Where the Research Meets the Road

At this time of year, most of us are coming out of the winter doldrums and looking forward to warmer weather, longer days and the other signs of spring. But the National AHS Consortium is focused on some of the "dog days" of summer, when the National AHS Consortium Technical Feasibility Demonstration (Demo '97) will showcase AHS technologies on the high-occupancy vehicle lanes of Interstate 15 just north of San Diego on August 7-10.

Demo '97, represents the culmination of a two-year effort by the Consortium to develop and demonstrate AHS technologies as a viable solution to the mounting challenges that are facing America's surface transportation system. Plans call for the largest

full-scale, live, multi-vehicle demonstration of AHS technologies that will provide stakeholders, elected officials, the media and the general public with a glimpse of the potential safety, environmental and efficiency benefits in a real-world/real-time setting.

"Demo '97 provides a unique opportunity to witness the great variety of cutting edge technologies that are being brought to bear on the feasibility aspect of AHS," explains Pat McKenzie of Lockheed Martin. "Automated lane keeping, for example, will be demonstrated in a variety of ways: one scenario follows magnets imbedded in the roadway, another tracks a radar reflective stripe, several others use a variety of vision based systems. Laser-based systems, radar applications in obsta-

cle detection and lateral control, advanced communications concepts, new technology advancements in infrastructure maintenance ... the list goes on and on. Our challenge is to combine all of these related efforts into a cohesive presentation for Demo '97" said McKenzie, who leads the Demo Systems Integration Team.

In the adjacent AHS Exposition Center at Miramar College, attendees will learn more about AHS, the Consortium's work and associated stakeholder industries and organizations through a series of exhibits, presentations, stand-alone demonstrations, component displays and simulations designed to enlighten and entertain.

Continued on page 5

Demonstration '97 at a Glance

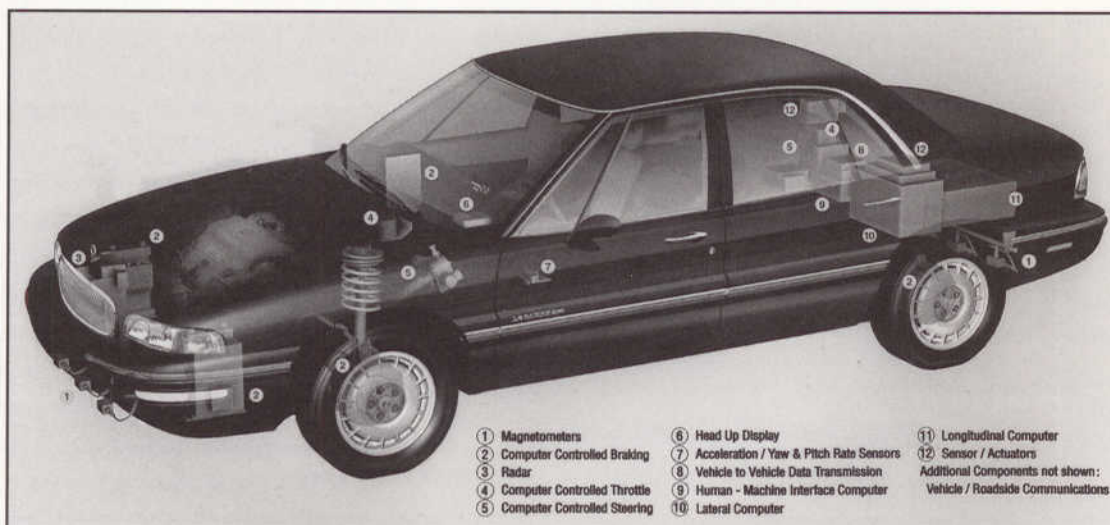
Who: The NAHSC Core Participants (see complete list on the back page) and five NAHSC Demo Associate Participants — Eaton Vorad, Houston Metro, Honda, Ohio State University and Toyota.

What: A demonstration of several configurations of AHS technologies. Vehicle test rides will show how the technologies work together as a complete system in various scenarios. An Exposition Center will include stakeholder booths, small-scale demonstrations, other sponsored facilities and activities, media work room and press conference areas and the Demonstration Presentation Center with live and file video feeds of vehicle scenarios and other activities.

When: Thursday, August 7 through Sunday, August 10, 1997.

Where: The high-occupancy vehicle (HOV) lanes on a 7.6 mile stretch of Interstate 15 just north of San Diego. The Exposition Center will be located at Miramar College, adjacent to the I-15 HOV lanes.

Why: To show stakeholders, policymakers, the media and the general public that AHS technologies are not only possible, but beneficial for transit, trucking and motorists in general. Through continued work towards AHS deployment, the safest, most efficient highway system can be achieved. ■



A cutaway of one of the eight Buick LeSabres, as it will be equipped for Demo '97 in August. Demonstrating the platooning scenario, the Buicks will show automated lateral (steering) and longitudinal (acceleration/braking) operations, obstacle detection and avoidance and the merging of the vehicle into the platoon or virtual train of cars.

NAHSC Profile: Charles "Chuck" Thorpe

NAHSC Site Manager, Carnegie Mellon University

In 1979, Chuck Thorpe was a new doctoral student in Carnegie Mellon's Computer Science Department, wondering what direction to follow, when his future adviser Raj Reddy announced plans to start a Robotics Institute. Thorpe was his first robotics graduate student. Thorpe got the feel of autonomous machines in the lab of his other adviser, Hans Moravec, developer of some of the world's first mobile robots. In 1984, he wrote his doctoral thesis on vision and path planning. He also wrote a proposal to the Defense Advanced Research Projects Agency to develop techniques for driving in hazardous environments. The resulting grant funded development of Navlab I, a blue Chevrolet van that trundled along on its own at a maximum speed of 1.5 miles an hour. It spawned a host of offspring, including those that will play a key role in NAHSC's upcoming Technical Feasibility Demonstration.



Thorpe fell in love with machines as a youngster, growing up in the northwestern corner of Zaire in Africa, where his father was a surgeon and both parents served as missionaries. Thorpe remembers jungles,

grassland, talking drums, exotic food and people, strange languages and a cinder block house with a wood stove and electricity that only worked in the evenings. "The things that got us excited were based on technology," he recalls--"trucks and generators that had to be fixed. It was good preparation for doing robotics research." Thorpe spent eight

Chuck Thorpe

Position: NAHSC Site Manager, Carnegie Mellon University

Office: Pittsburgh, Pennsylvania

Place of Birth: Lansing, Michigan

Education: B.A., Natural Science, North Park College (1979) Chicago; Ph.D. computer science, Carnegie Mellon (1984)

Home: Pittsburgh, Pennsylvania

years in Africa, attending an American day school near his home. Intending to be a doctor like his father, Thorpe went to North Park College in Chicago. But he found himself bored by anatomy and intrigued by computers. He applied to Carnegie Mellon because of the work researchers there were doing in artificial intelligence. He was accepted and the rest is history.

"We've made 12 years of progress on those wheels," Thorpe says. "It's been gratifying to achieve a good level of success -- a lot of credit goes to those who envisioned the potential benefits of this research and made the necessary funding possible." Thorpe adds, "In transportation, we've demonstrated some

exciting capabilities, but we still have a significant amount of work to do before our research is complete. We're looking forward to the Technical Feasibility Demonstration in San Diego and to getting feedback from our stakeholders about the next steps to take." ■

Newsbrief

■ AHS technologies, the Consortium and its Core Participants were featured in newspaper, magazine, TV and radio broadcasts and cable television. A "short list" of these media:

- *The London (England) Sunday Times*
- *The Oakland (Ca.) Tribune*
- *ITS World magazine*
- *CIO magazine*
- *Traffic Technology International (Feb./March issue)*
- *ITS America News (Feb.)*
- *CNBC*
- *Several NBC broadcast affiliates (Boston, San Diego, Miami, etc.)*
- *"Extra" syndicated broadcast news magazine*
- *R & D magazine*
- *Washington Times*
- *USA Today*
 - *Cover story (April 9)*
 - *Rilling's editorial response (April 24)*
- *Automotive News (April 21)*
- *The Detroit News*
- *Autoweek*
- *CNN's Newsday*

Catch coverage of AHS on "The Learning Channel's Understanding Cars" on Saturday, May 10, at 10 p.m. EDT. (Please check the listing for broadcast in other time zones.)

Associate Participants bring a wealth of technology and expertise to the NAHSC Technical Feasibility Demonstration

In addition to the Consortium Core Participants involved in Demo '97, there are five Associate Participants who will also demonstrate technical AHS scenarios. Known as "Demo Associates," their scenarios range from showing incremental AHS deployment to full-scale automation. The Demo Associates are: Eaton Vorad, Honda, The Ohio State University, Toyota (and their associated team) and the Transit Authority of Harris County (Houston Metro).

Eaton Vorad will demonstrate a truck utilizing AHS building-block technologies in the "commercial truck" scenario. This scenario involves a tractor-trailer truck and a car on the highway lanes. The truck will use Eaton Vorad's SmartCruise® Enhanced Cruise Control, allowing it to follow the car at a constant headway while the car changes speed several times. Eaton Vorad will also demonstrate its blind-spot collision warning system.

Honda R&D North America's "control transition" scenario will demonstrate two approaches to automated highway systems: an infrastructure-supported approach and an independent vehicle approach. Combining the advantages of both of these approaches into one vehicle, Honda will demonstrate "infrastructure-supported platooning capability" and "autonomous free-agent capability" using two AHS-equipped Honda Accords. Honda scenario components include lane-keeping and obstacle avoidance using sensors and adaptive cruise control.

Houston Metro will showcase the use of buses integrated with free-agent passenger cars in the "multi-platform/free-agent" scenario. The transit vehicles in the scenario will be two New Flyer buses demonstrating lateral control and headway maintenance. The two New Flyer buses are equipped with automated lateral and longitudinal control systems. The scenario will also demonstrate a lane change using lateral control and headway maintenance using longitudinal control.

The Ohio State University will be demonstrating an "alternative technology scenario" that has transitions between different technologies. Approximately four miles of highway will be equipped with radar-reflective tape produced by 3M. The radar-reflective tape and a single camera-based vision system will be used for lateral control, an Eaton Vorad

low-powered radar will be used for side vehicle detection and a laser system will be used for longitudinal control together with a radar system. The scenario will use one manually driven and two automated Honda cars and will show automated vehicle following, using longitudinal control and automated lane change to pass a manually driven car.

Toyota, in conjunction with the Toyota Technical Center, IMRA and AISIN, will be

demonstrating an "evolutionary scenario" using the existing highway infrastructure. The vehicles involved in the scenario will be two experimental automated vehicles based on the Toyota Avalon and two non-automated Toyota Camrys. Technologies to be shown in this scenario include: lane departure warning and control, adaptive cruise control, blind spot warning, automatic control in stop-and-go traffic, lane tracking based on machine vision, automatic lane change and return-for-obstacle avoidance, cooperative vehicle following and emergency stopping for obstacle avoidance.

While each of these Demo Associate Participants are adding a lot of their technical expertise to Demonstration '97, there are several other Associates Participants who are also making important contributions at Demonstration '97. The California Highway Patrol and the San Diego Association of Governments are advising the NAHSC on safety, security and community issues for the demonstration. The San Diego Regional Transportation and Technology Association (RTTA), Automobile Club of Southern California and San Diego Association of Governments (SANDAG) have been assisting the NAHSC in the public education efforts in the San Diego area. ■



At the Demonstration Information Briefing for the Program Manager's Council held at Miramar College in February (from left to right), FHWA AHS Program Manager Dick Bishop; Honda R & D's Damon Delorenzis; Alan Lubliner, Societal and Institutional Task Team lead with Parsons Brinckerhoff; and Jim Misener, "Tools" Task Team lead with PATH.

Liability workshop outlines issues and paves path for investigation, resolution

The NAHSC's Societal and Institutional Task Team, ITS America and the American Association of State Highway & Transportation Officials (ASHTO) held a joint workshop in mid-February, focusing on the identification and analysis of critical liability issues associated with advanced vehicle control (AVCS) and automated highway systems (AHS).

The sixty-five professionals who attended the two-day workshop held in Washington, D.C., used a process known as Nominal Group Technique that allowed diverse participant viewpoints to identify system liability requirements, develop solutions to likely conflicts and specify priorities.

Liability workshop participants contributed their viewpoints from a wide variety of professional perspectives on liability issues. Trial and defense counselors, insurance brokers from different parts of the U.S. and representatives from product and service providers and federal and state transportation officials were among the participants who used the Nominal Group Technique to identify and solve differences in widely varying backgrounds and even dissimilar professional terminology or industry jargon.

After a background briefing by NAHSC Program Manager Jim Rillings, August Burgett and John Donaldson of NHTSA, and ITS America Director of Policy and Partnerships Craig Roberts, the nominal group technique was put into action. This process challenged participants to specify and prioritize liability issues associated with automated vehicle control. Issues were segmented into lists of hopes, concerns and fears held by common interest groups.

Following a plenary report of the results of the first breakout session, the workshop continued into the afternoon, where these groups reassembled to identify potential conflicts between stakeholders. Questions such as, "How has your interest group dealt with conflicts on liability in the past?" and "How do you foresee AHS changing liability for

your industry or interest group?" fueled the workshop discussion.

During the second morning of the workshop, Stephen Roberts (of the legal firm Nossaman, Guthner, Knox & Elliott) presented some liability lessons learned from ITS deployment and John Bagby (of Pennsylvania

State University) talked about legal analogs in other industries such as aviation and airbags, that may be precedents for how liability can be managed.

With the stage set, the participants worked to resolve identified conflicts and identify still-missing pieces of the liability puzzle.

Questions focusing on the similarity and ramifications of the recent anti-lock brakes and air

bag issues and how liability considerations should or might influence the design of the automated highway system were posed, followed by lively discussions between workshop sponsors, presenters and attendees.

In summary, the issues were captured, prioritized and the path to resolution was more clearly defined. Workshop participants agreed more investigation is necessary in conjunction with the development of the technical deployment plan of vehicle control systems. Most significantly, the participants concluded that liability is not a "showstopper" for development and deployment of AVCS and AHS. It is a major challenge, but one that appears to be manageable.

According to workshop coordinator Janie Blanchard, of Bechtel, each workshop participant will be contacted with details of additional activities that will build upon the groundwork laid at this first AHS/AVCS liability workshop. ■

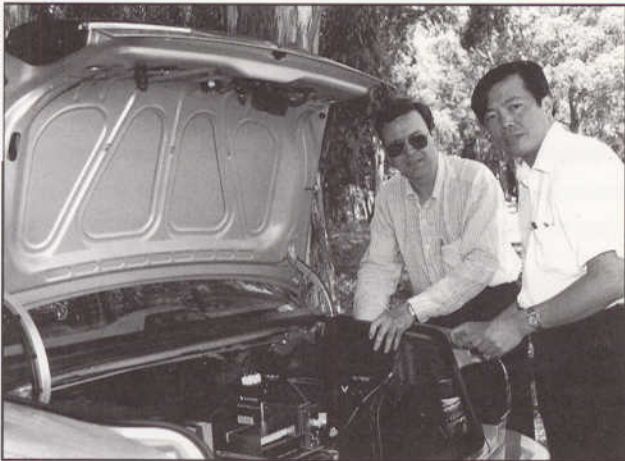


Use of the Nominal Group Technique to guide discussion at the Liability Workshop is shown (above) by the posted color-coded issues statements, grouped according to stakeholder group and the priority each placed upon the importance of each issue statement.

Interested in a sponsorship or exhibit space at the Demo '97 Exposition Center? Contact Jennifer Cenedella at (703) 706-8248.

Demonstration '97: *(Continued from page 1)*

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PATH Deputy Director Steven Shladover and Research Specialist Wei-Bin Zhang with automated Buick LeSabre.

When asked about his organization's participation in Demonstration '97, Robert MacLennan, general manager of Houston Metro (Metropolitan Transit Authority of Harris County) said, "We're set to show how transit operations can be improved through AHS. It's the first major step toward adopting these new AHS technologies to help METRO contin-

ue to improve mobility in the Houston area – and it holds the promise to do the same for transit operations throughout the U.S."

Supporting Demo '97's exciting array of activities is a broad-based public education program designed to activate AHS stakeholders in this effort, maximize Demonstration attendance, build support for the

AHS Program and promote the vision and potential benefits of AHS deployment to likely system users, operators and implementers.

"Of course the technical content has to be there, but educating

our stakeholders is also a big part of the success of the Demo," says Terry Quinlan, NAHSC test and demonstration manager. "Once highway users understand the true benefits of AHS, they're likely to become excited about its potential and look forward to deployment of near-term AHS technologies such as adaptive cruise control, collision warning systems and lane departure detection." ■



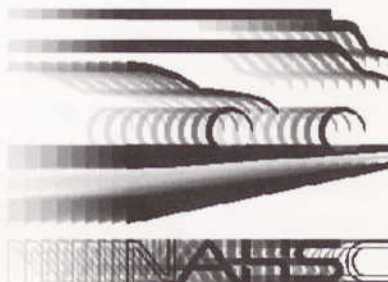
Juergen Guldner, an assistant research engineer at PATH, goes for a no-hands drive in a test LeSabre that will be used in Demo '97.

Web Site Update

[www://nahsc.volpe.dot.gov](http://nahsc.volpe.dot.gov)

If you haven't accessed our web site yet, there's a wealth of information about the Consortium and AHS technologies to discover on-line. Be sure to check out the new Demo '97-specific section for the latest updates as August draws nearer. Near-term site improvements call for the installation of a bulletin board – so, in addition to the Consortium's comments@nahs.org e-mail address, stakeholders will be able to communicate through an on-line bulletin board. Other near-term improvements include additional graphics, Consortium meeting minutes, a complete NAHSC Associate Participant list and various documents and presentations that can be downloaded.

Furthermore, Core and Associate Participants can post their news and information on the *What's New* section on the public side of the web site or the *Participant News* section of the password protected area. ■



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AHS Calendar of Events

Date	Location	Event
June 2-4, 1997	Washington, D.C.	ITS America Annual Meeting
June 4-5 1997	McLean, Va.	NAHSC Program Management Oversight Committee meeting
June 5-6, 1997	Washington, D.C.	NAHSC Stakeholder Forum
August 6-9, 1997	San Diego	Society of Automotive Engineers (SAE) Future Transportation Technology Conference
August 7-10, 1997	San Diego	NAHSC Technical Feasibility Demonstration
August 11-12	San Diego	International Workshop on Vehicle Highway Automation Sponsored by FHWA, NAHSC, ITS America, Transportation Research Board Task Force on AHS and the International AHS Task Force

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Name _____ Organization _____
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 Phone _____
 Fax _____

Are you a member of one of the stakeholder groups? Please indicate one:

Vehicle Industry Vehicle Electronics Industry Transportation Users
 State Government Agency Environmental Interests Insurance Industry
 Local Government Agency Trucking Operators Other
 Highway Design Industry Transit Operators _____

NAHSC Core Participants

- **Bechtel**
(Transportation design and construction representative)
- **Caltrans (California Department of Transportation)**
(State/regional/metropolitan transportation agencies representative)
- **Carnegie Mellon University**
(Center for research on machine/vehicle intelligence)
- **Delco Electronics**
(Vehicle electronics industry representative)
- **General Motors**
(Vehicle industry representative)
- **Hughes**
(Aerospace systems industry representative)
- **Lockheed Martin**
(Aerospace/electronics systems industry representative)
- **Parsons Brinckerhoff**
(Transportation infrastructure and systems engineering representative)
- **The University of California PATH Program**
(Leading AHS research group in the U.S.)

*In partnership with the
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 Federal Highway Administration*

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Demo '97 Meets Congressional Mandate, Shows Potential of AHS to the World

Congratulations to all for a successful "DEMO '97" — the congressionally mandated 1997 Automated Highway System Proof of Technical Feasibility Demonstration. Nearly three years of planning and development resulted in an extremely successful event — an event that captured the attention of the world.

Not only did scores of industry leaders attend the demonstration, many of the nation's key policy setters were in San Diego to experience automated travel first-hand. U.S. Secretary of Transportation, Rodney Slater visited the demonstration site prior to the opening ceremony and following his ride on an automated bus, expressed his surprise that the technology was so advanced. Senator John

Chaffee and Congressman Duke Cunningham were equally impressed with their automated rides and with the progress made by the NAHSC. The entire leadership unit of the Federal Highway

"We can no longer solve the safety and mobility problems on our highways by simply building more roads."

Jim Rillings, quoted in the *Chicago Sun-Times*

Administration, including acting administrator, Gloria Jeff, and all 10 FHWA regional administrators, spent a day visiting the Exposition Center and riding automated vehicles on Interstate I-15. Deputy Secretary of Transportation Mort Downey, Christine Johnson, direc-

tor of the ITS Joint Program Office, and numerous technology and transportation policy makers and industry leaders experienced automated travel in a variety of operational environments called "scenarios."

Seven scenarios demonstrated what automated travel would be like in cars, trucks and buses in both urban and rural settings. Twenty-one automated vehicles running on seven different automaker platforms demonstrated lane departure and collision warning systems, lane keeping and crash avoidance systems, fully automated platoons of tightly spaced vehicles and fully automated cars mixed with manual vehi-

Continued on page 5

Demo '97 at a Glance

- 21 automated vehicles (cars, buses and a tractor-trailer truck with lateral and/or longitudinal control)
- Seven scenarios:
 - Free Agent, Multi-Platforms
 - Platooning
 - Maintenance
 - Control Transition
 - Commercial Vehicle (Truck)
 - Alternative Technology
 - Evolutionary
- More than 10,000 automated miles were driven during I-15 and Expo Center test-track demos
- 3,250 people experienced riding in an automated vehicle on I-15 during the four Demo Days (Aug. 7-10)
- Estimated total circulation of published stories about Demo '97 in the U.S. = 75 million (to date)

A Letter from Jim Rillings, Outgoing NAHSC Program Manager

To the Participants and Stakeholders of the NAHSC:

The National Automated Highway System Consortium completed a major milestone in August by demonstrating the technical feasibility of an automated highway system to the world. Demo '97 was an outstanding example of what can be accomplished through public-private partnership. As we work to analyze the results of Demo '97, a lot of you are asking what's next

for the NAHSC.

The AHS stakeholders, through their representatives on the Program Management Oversight Committee and through their participation in our workshops and forums, have emphasized the importance of the early stages of progressive deployment towards AHS. In concert with direction from U.S. DOT, our own work on societal and institutional issues confirmed this need. For these reasons, we are increasing our effort to define the

stages of technology and early deployment that move us towards a future fully automated highway system. We recognize that each stage must make sense technically, economically and in the marketplace — or it will never happen and we will never achieve the full benefits of vehicle-highway automation.

As part of this effort we are working to coordinate our pro-

Continued on page 5



NAHSC Profile: **Dick Bishop**

FHWA Program Manager, Vehicle-Highway Automation Research and Development

Dick Bishop has always been the kind of man who wants to make a difference — to make a substantial contribution to society, particularly in finding new ways for diverse players to work together. This motivation led him to a career in which, as Bishop explains, he is a contributor in the effort to apply technology to transportation, a field that is fundamental to the quality of life for everyone and one in which collaboration is essential for real progress.

As the federal program manager for vehicle-highway automation research and development, Bishop ensures that the work of the NAHSC is in line with U.S. policy objectives. He is also responsible for developing and advocating the federal budget for this program. Bishop says this work requires an openness to the views and participation of many stakeholders, and good stewardship of federal dollars. He explains, "I look for connections between activities and events that other people may not see, aligning interests to form a synergistic relationship. I honor people's motivations and organizational objectives, finding ways to blend all of this to accomplish larger goals. My objective is to see these technologies come into use sooner rather than later," he adds.

Bishop feels great satisfaction forming and participating in these partnerships — and feels they can be particularly effective. He elaborates, "When I see the right people working together and offering their expertise, their resources and aligning individual interests, and then see the fruits of the partnership synergy, I get a charge out of that."

He cites Demo '97 as an excellent example of this type of synergy. All of the elements worked together, allowing the demonstration and its extensive media coverage to transform people's thinking about what's possible in automation technology — a very satisfying shift in thinking on a global basis, according to Bishop.

"I enjoy helping people gain a larger sense of what is possible and on an individual level, to wake up to a larger sense of their own capabilities. I do personal development training and I really like to help people

master the power of their mind," Bishop explains. "My prime personal focus is awakening to my total self — physically, mentally, emotionally and spiritually — to be fully alive."



Dick Bishop

Position: program manager, Vehicle-Highway Automation Research and Development, Federal Highway Administration

Office: Turner-Fairbank Highway Research Center, McLean, Virginia

Place of Birth: Moss Point, Mississippi

Education: BS, Electrical Engineering, Auburn University, 1981

MS, Technical Management, Johns Hopkins University, 1992

Home: Columbia, Maryland

Family: Wife, Harriet, and six-year-old son, Jimmy

When Bishop started working in the field of vehicle-highway automation in 1991, Lyle Saxton, former director of the Federal Highway Administration's Office of Safety and Traffic Operations R&D, was an influential mentor. With the passage of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and its mandate for an AHS demonstration by 1997, the low-key federal program experienced a quantum leap in intensity. Bishop and Saxton, with the help of a handful of others, crafted the program that is now in place. Bishop states that if he has a legacy, it would likely be his efforts to harness the energy of stakeholders. The concept of automated highways has dual challenges — credibility and technol-

ogy — toward becoming a reality.

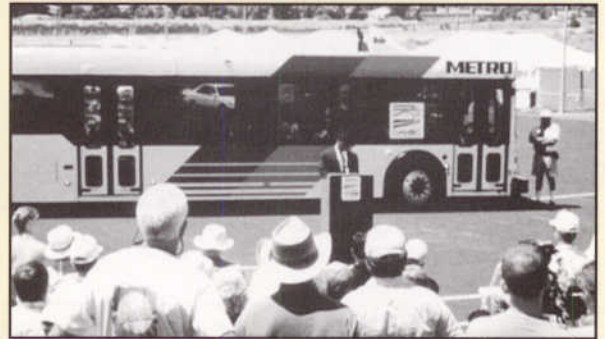
Looking toward the future, Bishop says, "I plan to continue cultivating the field of vehicle-highway automation. I see the next several years as very exciting. Looking back over the ISTEA era, this is a time when the information layer of ITS grew from concept into implementation. I see exactly the same thing happening with vehicle control during the NEXTEA era — a thriving R&D arena across all vehicle types and on roadways around the world. The new U.S. DOT Intelligent Vehicle Initiative (IVI) will provide an excellent platform for these activities from the federal side, and I see the NAHSC continuing to thrive as a key player in our national program. ■

"If we can do things with technology...so we can operate more safely and smoothly in traffic, we'll all benefit. This is absolutely do-able."

From Bishop's on-camera interview with CBS News during Demo '97



National AHS Consortium
Technical Feasibility Demonstration



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Clockwise from upper left:

■ Congressman Ron Packard introduces fellow House Representative George Brown at the opening ceremony held Thursday, August 7, to begin all of the Demo Days activities.

■ A media correspondent interviews a Russian transportation official after her ride on I-15 in the automated maintenance scenario.

■ The Lockheed Martin exhibit in the 33,000-square-foot Expo Center saw a good deal of foot traffic. Attendees from industry and the general public had various opportunities to discuss the potential of vehicle-highway automation and what it might mean to their business and overall quality of life.

■ U.S. Transportation Secretary Rodney Slater rode in the free agent scenario's automated transit bus just before the demonstration. In his remarks just after his ride he told the crowd that the Consortium had not only met, but exceeded the congressional mandate put before it in the 1991 ISTEA legislation.

■ Lined up underneath the "clamshell" at the south control yard and ready to roll northward, the 26 vehicles used in the demonstration drives on I-15 were in position before being dispatched by the control center, via two-way radio communications. Given the varying scenario speeds, obstacles and scripts, it required nearly 50 minutes for all the vehicles to dispatch and travel to the opposite end of the lanes.

■ Carpé Demo! The teams gathered during the last Demo Day for group photos at the south control yard, Expo Center, passenger staging center, north staging area and anywhere else the cameras could catch them as they took a moment to record their participation in this historic event.

■ Terry Quinlan, NAHSC Test & Demonstration manager, led the Demo Team to success.

■ Executives representing the NAHSC Core and Demo Associate Participant organizations gathered before the opening ceremony.

First International Workshop on Vehicle-Highway Automation Establishes International Cooperation

The first International Workshop on Vehicle-Highway Automation was held in San Diego on August 11th and 12th, immediately following Demo '97. More than 100 participants from Europe, Japan, the Pacific Rim, Australia and North America gathered to compare notes and consider the potential for vehicle-highway automation in their national transportation systems. The workshop was co-sponsored by ITS America and the NAHSC.

Dick Bishop, the workshop chairman, offered three goals for the two-day event: "The first objective is enlightenment — to learn about other countries' activities and perspectives, enhancing collective understanding of the field; second, momentum — to continue the international momentum of Demo '97, creating new momentum by assisting all representatives to articulate and support programs in their countries. Bishop adds, "And third, to establish a path of cooperation for years to come, including continuing annual workshops and task forces to examine key issues of broad interest.

Just as Demo '97 was not only about full automation, but a spectrum of evolutionary capabilities, so too was this workshop. Program managers from Japan, Europe and the U.S. described research and development focused on the range of automation to the group, through panel sessions organized by Program Chairman Dr. Rodney Lay of Mitretek Systems. These sessions focused on liability issues, deployment, and rollout of new capabilities. Perspectives were offered by both commercial companies and public transportation agencies. Dr. Christine

Johnson, director of the ITS Joint Program Office for U.S. DOT, addressed the group at the opening night reception.

She noted common areas in the history of science, including visionaries and champions that could articulate the issues, the technology and the value of healthy collaborative competition. "All of these elements exist in ITS/AHS development," she said. "Because we live in a global economy, we have no alternative but for our science and technology to be global also. To share information is the only way to survive and get ahead."

The workshop culminated with a strategy development session, where several key issues were identified, including the need for common global terminology, assessment of benefits to departments of transportation (and hence public benefits) and further deployment path development. These issues will be addressed by task groups formed at the workshop, who plan to collaborate via e-mail during the next year. The group enthusiastically supported a meeting in 1998, which will be held in conjunction with the Automated Vehicle Guidance demonstrations slated for June in The Netherlands.

This workshop superseded its goal to create enlightenment, add momentum and establish international cooperation. Clearly, the gathering set the stage for steadily increasing activity in the burgeoning field of automated driving — thanks to Demo '97 and this workshop, it's now a worldwide stage. ■

Newsbrief

BROADCAST COVERAGE OF DEMO '97 INCLUDED:

- MSNBC, "The Site" (live) — 7/22
- CNN/Headline News — 7/23
- ABC World News Now — 7/23
- NBC News at Sunrise/Nightside — 7/23
- CNBC "Power Lunch" — 7/23
- Late Night with David Letterman (monologue joke about good for California drivers) — 7/23
- The Osgood File, CBS Radio (syndicated) — 7/23
- CBS Evening News — 8/6
- CBS This Morning — 8/6
- National Public Radio, "All Things Considered" — 8/6
- CBS This Morning — 8/7

- News Hour with Jim Lehrer — 8/8
- More than 220 affiliate/local TV and cable stations presented the AHS Demo '97 story during July, August and September

PRINT EXPOSURE INCLUDED:

- Associate Press (coverage in more than 1,000 newspapers) — 7/23
- USA Today — 7/23
- The Wall Street Journal — 7/24
- BusinessWeek — 8/4
- The New York Times — 8/7 (New York Times News [wire] Service with high-profile pickup including the Chicago Tribune)
- Washington Post — 8/9
- San Diego Union-Tribune — 8/3, 7, 8 and 11

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Demo '97

(Continued from page 1)

cles. More than 3,500 people visited the Exposition Center and approximately 3,500 passengers experienced nearly 10,000 miles of automated travel.

"We can't keep building ourselves out of traffic congestion, so we have to think about new technologies to enhance our freeways."

Hamed Benouar,
NAHSC /Caltrans site manager

Many of these riders were asked to respond to a number of pre- and post-demonstration questions to aid the Consortium in future planning. Overall, responses were very positive. Ninety-five percent of the respondents believed AHS technologies would increase safety and 90 percent felt the use of AHS technologies would reduce congestion. Cost was

seen as the most significant barrier to implementation (40 percent of respondents felt cost would be the greatest deterrent to implementation), with public acceptance (33 percent) and liability issues (22 percent) falling close behind. Although a few riders (1 percent) said they would not purchase AHS technologies, nearly half of all respondents indicated that they would be willing to pay an additional \$1000 for an AHS-equipped car. Twenty-five percent of the riders indicated they would be willing to pay up to \$1,500 more and 15 percent were willing to pay more than \$1,500 extra for an AHS-equipped car. Although the results of these surveys are not conclusive, interest in automated vehicle technology is clear.

Interest in automated highways was also very evident in the huge media turnout surrounding Demo '97. "Never had so many reporters wanted to learn so much about ITS in such a short time," noted *Inside ITS*. Broadcast coverage included ABC, CBS, NBC, FOX, PBS, CNN,

and NPR. AHS stories appeared in opinion-leader newspapers including *The Wall Street Journal*, *Washington Post*, *USA Today*, *The New*

"At first, it was a little scary, but after about five minutes, you get used to it."

H. E. Edmonson,
Houston Metro automated bus driver/ rider as
quoted in *The New York Times*

York Times and *Newsweek*. Stories featuring Demo '97 ran in 12 countries across five continents. All 50 states and the District of Columbia covered the event. The total estimated circulation to date, in the U.S. alone, exceeds 75 million.

If the response to Demo '97 is 12 kind of indicator of what lies ahead for automated vehicle technologies, hold on to your hat with both hands — and prepare to enter the automated highway! ■

Letter from James Rillings

(Continued from page 1)

gram tasks with the new U.S. DOT Intelligent Vehicle Initiative (IVI) which will integrate all of the U.S. DOT vehicle-related ITS activities. The NAHSC plans to continue its work to develop and demonstrate a full range of vehicle-highway automation technologies to provide unprecedented benefits to safety, efficiency and the environment.

These include obstacle detection, vehicle-to-vehicle communications, vehicle-to-roadway communications and crash avoidance as well as partial and full automation of the driving task. We are increasing our emphasis on those features that can be achieved in the relatively near-term and offer immediate benefits, especially increased safety, to all highway users.

We now have nine case studies underway or in the planning stages with state and local transportation agencies. We will continue to support these studies and expect that the most promising of these will evolve into field tests or

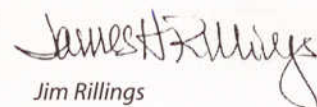
small-scale demonstrations to explore deployment issues.

The future of the AHS Program depends, in part, on legislation now being addressed by the U.S. Congress. Both the House and Senate Appropriations Committees agreed with the Administration's request to move funding for AHS to contract authority. This is good news, since it will put an end to the annual uncertainty about when the next year's budget will be approved and for how much. It will also eliminate the significant replanning effort each year. This also means, however, that funding for the AHS Program must be covered in the renewal of the Intermodal Surface Transportation Efficiency Act of 1991. The House and Senate each have a bill under consideration and AHS is treated differently in the two bills. Needless to say, we will be watching the deliberations on Capitol Hill with interest.

Despite these uncertainties, the NAHSC team remains optimistic and is moving forward to capitalize on the results of Demo 97 and to move the AHS Program into its next phase.

As many of you know, I have been given a new assignment as program manager of the General Motors ITS Program Office with responsibility for planning and coordinating GM's worldwide ITS program. While no longer serving as the NAHSC program manager, I will continue to be active in the Consortium as General Motors' representative on the Program Management Oversight Committee. In that role, I look forward to continue working with you to make vehicle-highway automation technologies a reality and the achievement of real transportation benefits for the U.S.

My time with the NAHSC has been the greatest assignment of my career and I thank you all for making it so.



Jim Rillings

Editor's note: In September, Steve Carlton, site manager from Lockheed Martin, was named the interim NAHSC program manager. His assignment is expected to last into 1998.



Senator Frank Lautenberg (D-NJ), left, confers with NAHSC Interim Program Manager Steve Carlton, right, about the future of the AHS Program at the recent Congressional Briefing on Demo '97.

Members of Congress, committee staff, senior administration officials and stakeholder representatives learned more about the success of Demo '97, exchanging ideas about ISTEA reauthorization and provisions for the AHS Program.

Other prominent attendees included Sen. Dirk Kempthorne (R-ID), Rep. Jay Kim (R-CA 41st), Rep. John Cooksey (R-LA 5th), U.S. DOT Deputy Secretary Morton Downey and FHWA Acting Administrator Gloria Jeff.

NAHSC Core Participants

- **Bechtel**
(Transportation design and construction representative)
- **Caltrans (California Department of Transportation)**
(State/regional/metropolitan transportation agencies representative)
- **Carnegie Mellon University**
(Center for research on machine/vehicle intelligence)
- **Delco Electronics**
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- **General Motors**
(Vehicle industry representative)
- **Hughes**
(Aerospace systems industry representative)
- **Lockheed Martin**
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- **Parsons Brinckerhoff**
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| <input type="checkbox"/> Local Government Agency | <input type="checkbox"/> Trucking Operators | <input type="checkbox"/> Other _____ |
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