

**Written Questions Submitted for Response at the  
National Highway Traffic Safety Administration  
Research and Development Programs Public Meeting  
Best Western Gateway International Hotel  
November 14, 2001, 1:30 p.m. - 5:00 p.m.**

Alliance of Automobile Manufacturers

Question 1: Please provide a summary of current and anticipated NHTSA research regarding driver behavior and systems required to keep the driver alert in a cockpit without a steering wheel. Does NHTSA know of anyone else who is conducting research in this area?

Answer:

NHTSA is not doing research on that subject. We do not know who else is doing this work.

Question 2: Please provide a summary of NHTSA's driver workload assessment research (major milestones, timing, significant findings, future plans).

Answer:

The best source that describes our research in this area is the International Technical Conference on the Enhanced Safety of Vehicles (ESV) paper, "NHTSA Driver Distraction Research: Past, Present, and Future," by Ranney, Garrott, and Goodman. This paper can be downloaded from the ESV Conference proceedings on our Web site. Two significant programs were not described in this document: (1) The Driver Workload Metrics project under the Collision Avoidance Metrics Partnership (GM, Ford, Toyota, and Nissan) is an Intelligent Transportation Systems (ITS) Intelligent Vehicle Initiative (IVI) related project. This project will develop measures to determine what device features and functions should not be accessible by the driver while driving. This project is scheduled to be complete in June 2004. (2) The second is a new research project called SAFETY VEHICLE using adaptive Interface Technology (SAVE-IT). This project has the basic objective of developing, demonstrating, and evaluating the potential safety benefits of an automotive system that manages the information from various in-vehicle technologies to minimize driver distraction based on real-time monitoring of the roadway environment and the driver's capabilities to attend to the demands of the driving task. A solicitation describing this program is currently on [www.fedbizops.gov](http://www.fedbizops.gov), #DTRS57-02-R-20003.

Question 3: What is the status and future direction of the "intelligent vehicle initiative" rear-end collision avoidance system operational tests?

Answer:

The light vehicle rear-end collision avoidance project is 2 months away from completion of Phase I of the project. A prototype vehicle has been developed and has been subjected to a battery of tests to verify system performance against the design guidelines.

In December, a decision on the second phase of the project will be made. The plan for the next phase calls for building a fleet of 10 vehicles, which will be driven by volunteer drivers for 2 to 4 weeks over a period of 10 months. Phase II of the project will last approximately 2 years.

In cooperation with Volvo Trucks, North America, Inc., and US Xpress, Inc., 100 Volvo tractors equipped with adaptive cruise control and Vorad radar sensing systems have been placed in commercial service by US Xpress for evaluation of system performance. These tractors will be in commercial service until approximately June of 2003. The data collected from the field operational test will be analyzed to determine the effectiveness of the system.

Question 4: What is the status and future direction of the "improved frontal crash protection" program (specifically interested in problem identification and offset testing)?

Answer:

Research and Development is currently updating the analysis of the crash data for identifying the frontal crash environment. The latest analysis of the data was reported in "Evaluation of Frontal Offset/Oblique Crash Test Conditions" by Carl L. Ragland et al. at the Seventeenth International Technical Conference on the Enhanced Safety of Vehicles in June 2001. This report identified vehicles involved in offset-oblique (greater than 10 degrees) crashes as the largest percentage of frontal crashes (67%), and vehicles involved in offset-collinear (less than 10 degrees) crashes as the next largest percentage (16%). Data analysis is being expanded to look at occupant injuries and specific body region injuries and to include the latest available National Automotive Sampling System (NASS) data. Offset-oblique testing was conducted this fall with a Moving Deformable Barrier (MDB) patterned after the Insurance Institute for Highway (IIHS) MDB, but with additional crush depth for high-speed frontal simulation of an F-150 truck. This barrier

was also equipped with an array of 55 load cells for measuring parameters related to vehicle compatibility. The subject vehicle was a Dodge Neon, and tests were conducted with both the THOR dummy and the HIII dummy for comparison of injury measuring capabilities. Ford F-150 trucks as well as the MDBs (ballasted to the weight of the F-150s) were used as bullet vehicles. Future work will concentrate on additional testing with a redesigned MDB and establishment of aggressivity measurement parameters.

Question 5: What is the status and timing for the 5<sup>th</sup> percentile female dummy neck research?

Answer:

NHTSA has several research initiatives underway supporting the 5<sup>th</sup> female dummy neck research.

1. Biomechanical research efforts are underway to refine the mechanical characterization of the ligamentous neck, the moment properties of the occipital condyles, and the partitioning of forces and moments being borne by the ligamentous and muscular components of the neck. The results of this research are expected by April 2002.
2. Research for adapting the THOR 50<sup>th</sup> percentile dummy head/neck to the 50<sup>th</sup> percentile Hybrid III is underway. A production prototype THOR-like 50<sup>th</sup> percentile male head/neck for retrofit to Hybrid III is expected to be available by the end of this calendar year (2001), and the 5<sup>th</sup> female production prototype version of the same is expected by April 2002.

#### Association of International Automobile Manufacturers

Question 1: NHTSA recently issued a request for comment regarding glare from vehicle forward lighting. What is the current NHTSA R&D activity in this area? Do you anticipate additional research projects to evaluate comments received from the glare notice?

Answer:

The Headlighting Glare Notice of Request for Comment was published on September 28, 2001. The stated closing date is November 28, 2001; however, that date is being extended because of postal mail delivery problems. NHTSA has just initiated a 19-month research study to determine the causes of glare complaints from high intensity discharge (HID) and other new technology headlamp types. The tradeoffs these lamps provide between increased glare and visibility, as well as possible

approaches to reducing glare and other issues such as impact of different light distributions on glare, etc., will be addressed as part of the research.

The study will be completed by January 2003. At this point we do not anticipate any additional research. For further information, contact Mike Perel on (202) 366-5675.

Question 2: In July, NHTSA issued a request for comment on the agency's research plan to develop a dynamic rollover test. The plan included evaluation of the following dynamic maneuver tests: CU Double Lane Change VDA/ISO/Moose Test Open Loop Pseudo-Double Lane Change Ford Path Corrected Limit Lane Change Open Loop Fishhook Maneuver Test. Were there any significant changes to the planned tests based on the comments received?

Answer:

There have been no changes in the above test procedures because of the comments received in response to the Agency's notice and its analysis of the responses.

Question 3: The July rollover request for comment stated NHTSA's intention to publish a second notice in early 2002 presenting a tentative dynamic rollover test procedure chosen on the basis of this research and comments received. At the July Safety Performance Standards Program meeting, it was indicated that the initial testing would be completed by Thanksgiving, with testing for the final program to begin afterward. What is the status of this testing? Have any test maneuvers showed a clear advantage over the others? Have any test maneuvers been eliminated from further consideration

Answer:

The rollover test program has proceeded on schedule, and the bulk of the testing has already been completed. It is still anticipated that it will be completed by Thanksgiving. The findings of the program will be set forth in the second notice, which is anticipated to go out in early 2002. We do not plan to release any test results, such as maneuvers that have been eliminated or those that we believe are superior, prior to the second notice.

Question 4: According to information on the NHTSA website, the agency recently completed a workload evaluation protocol development program carried out within the context of heavy vehicle operations, and is currently performing an evaluation of existing products to assess the applicability of this protocol to automobile environments. What is the status of this research

program? Has a report been published on the initial research that describes the workload evaluation protocol?

Answer:

The heavy truck workload evaluation was completed in 1996. The heavy truck workload research findings were published in a seven-volume report which is available on the Electronic Data Library ([www.its.dot.gov/welcome.htm](http://www.its.dot.gov/welcome.htm)). The report title is "Heavy Vehicle Driver Workload Assessment." For additional information, see the answer to the Alliance of Automobile Manufacturers question 2.

#### First Technology Safety Systems

Question 1: When will the agency release the drawings of the latest version of the THOR 50<sup>th</sup> crash dummy?

Answer:

Comprehensive 50<sup>th</sup> male THOR Alpha documentation is expected to be released to NHTSA's Web site by the end of the year. This release will include the AutoCAD 2000 drawing package, users' manual, certification procedures document, biomechanical basis reference document, dedicated software, and a software users' guide.

Question 2: Similarly, when will the agency release the drawings for the THOR 5<sup>th</sup> small female crash dummy?

Answer:

Completion of small female THOR hardware development is anticipated within 12 to 14 months. Completion of 5<sup>th</sup> female THOR documentation will follow the hardware development and will be available 6 months after the hardware is developed.