RESPONSE TO WRITTEN QUESTION SUBMITTED FOR THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION RESEARCH AND DEVELOPMENT PROGRAMS PUBLIC MEETING JULY 18, 2002, HYATT REGENCY, INNER HARBOR, BALTIMORE, MD

Alliance of Automobile Manufacturers

Question: The agency has a number of on-going, or otherwise, research projects. Can updates on the following activities be provided?

a) Crash avoidance brake/steer intervention

Response:

The Agency is interested in three types of crash avoidance brake intervention: brake assist, anti-rollover braking, and electronic stability control. Brake assist, electronic stability control, and anti-rollover braking research has been postponed because of our accelerated efforts on the development of a dynamic rollover resistance-rating test as required under the Transportation Recall Enhancement, Accountability, and Documentation (TREAD) Act.

For additional information contact Riley Garrott, (937) 666-4511.

b) Guidelines for IVHS devices

Response:

There are no projects in NHTSA related to this topic.

c) Obstacle detection, front, rear, side

Response:

The Agency does not pursue research into obstacle detection, per se; but, we do pursue research into driver aids to help avoid collisions or reduce the effects of collisions. The form of this research is partnerships with industry to develop performance specifications for countermeasures and objective tests and evaluation procedures for countermeasures to ensure effective system performance. This is followed by field operational tests of these countermeasures to estimate the safety benefits. A critical component of this countermeasure development is, of course, potential crash threat dynamic condition sensors. However, the selection and development of these sensors are left to the industry partner as a part of their business plan. We invest in the integration of such threat sensors that are thought to be ready for integration.

We are now engaged in the following projects in this area: forward threat detection for a rear-end crash warning field operational test in partnership with General Motors and Delphi-Delco; forward and front-side threat detection for a road departure crash warning field operational test in partnership with the University of Michigan and Visteon; and forward, rearward, and side threat detection for a study of how people manage driving conflict in partnership with the State of Virginia and the Virginia Tech University. The GM/Delphi project has successfully completed system integration and design verification testing. It is now preparing for field data collection, which will

begin this summer. (A more complete report on this project is being presented at this public meeting.) The UMTRI/Visteon project is now in the system development phase and will begin field data collection next summer, provided that verification testing warrants further work. The Virginia naturalistic driving project is now completing system integration and will begin instrumenting vehicles for data collection this summer.

Potential crash forward and side crash threats are detected by a combination of radars, visible-spectrum cameras, and Global Positioning Systems with maps; while rearward crash threats are detected with radars and visible-spectrum cameras.

For additional information contact David Smith, (202) 366-5663.

d) Drowsy driver monitoring/warning

Response:

The Drowsy Driver Technology program has obtained favorable results from three tasks in preparation for the upcoming Field Operational Test (FOT), i.e., Sensor System Detection Envelope Characterization, Driver-Vehicle Interface Design, and Loss of Alertness Metric Revalidation. Each task was conducted with respect to the real-time sensor previously developed under this program. Final contractor briefings for the three tasks are scheduled for September 2002. The FOT task is also expected to begin by September 2002.

For additional information contact Paul Rau, (202) 366-5663.

e) Water beading windshield

Response:

NHTSA has no research work under this topic.

f) HD truck splash and spray

Response:

NHTSA has not done any research in this area for over 10 years.

g) Electronic stability control

Response:

Research on electronic stability control was initiated in 2000. The Agency tested a 1999 Mercedes ML320 and a 2000 Lexus LX470. A presentation on this work was made at the SAE Government/ Industry Meeting in May 2001. The presentation material can be accessed from the NHTSA's Web site at URL http://www-nrd.nhtsa.dot.gov/departments/nrd-01/presentations/sae.html.

Additional tests are on hold so that we can devote our efforts to the development of a dynamic rollover resistance-rating test as required under the TREAD Act.

For additional information contact Riley Garrott, (937) 666-4511.

h) Driver distraction

Response:

NHTSA recently completed a project that was an inventory of in-vehicle technologies that have design features that could influence driver distraction. The goal was to better understand the current state of practice of navigation, communication, and other types of advanced technology interfaces. The report characterizes emerging trends in such areas as display location, number of operating steps, and provisions for locking out demanding operations. The report is available on CD from NTIS (report number DOT HS 809 457).

NHTSA recently reported at the SAE Government/Industry meeting preliminary findings from its experimental study comparing handheld and hands-free "cell" phones. The presentation also covered NHTSA's research to evaluate voice interfaces for telematics functions. The findings indicated that the ease of use of the voice interface affected drivers' ability to use a hands-free system. The presentation is available on the NHTSA R&D Web site. The final reports on these studies will be available by December 2002.

NHTSA is continuing its research to evaluate voice interfaces to determine how they might influence driver distraction. A 12-month study to focus on voice interface design parameters such as menu structures, message length, and message complexity is being planned.

NHTSA will initiate a study this fall on the National Advanced Driving Simulator to study driver cognitive demands and driving performance when using hands-free and handheld "cell" phones.

NHTSA will be starting a study this fall to develop and evaluate a prototype of a real-time, adaptive interface system that can intelligently assess driver workload and distraction potential and use that information to control the information flow to drivers.

NHTSA received and reviewed the Alliance of Automobile Manufacturers document titled "Statement of Principles, Criteria, and Verification Procedures on Driver Interactions with Advanced In-Vehicle Information and Communication Systems." Comments on the document were sent to AAM by the Agency on June 21, 2002.

For additional information contact Michael Perel, (202) 366-5663.

i) Vehicle crash compatibility

Response:

NHTSA's Office of Research and Development has a number of activities that relate to compatibility currently underway. These include analysis of real world crash and laboratory test data, and development of suitable test devices and procedures capable of evaluating the aggressivity of vehicles in crashes.

NHTSA has amassed over 661 tests using the 36 (4 by 9 array) load cell barrier in the New Car Assessment Program (NCAP). The load cell size used in this testing is approximately 250 mm by 250 mm. Analysis of these NCAP results in comparison to higher resolution load cell barriers has

shown that the higher resolution load cell barriers may provide an improved characterization of vehicle front ends.

As part of the International Harmonized Research Agenda (IHRA) Vehicle Compatibility Working Group's efforts, NHTSA is studying the feasibility of developing test procedures that could be used to evaluate a vehicle's crash compatibility. As part of this effort, a number of test procedure alternatives have been identified for consideration: a vehicle-to-fixed rigid wall barrier (with and without a deformable face), moderate and high speed offset deformable crash tests, and moving deformable barrier-to-stationary vehicle crash tests. All of these crash test procedures are in various stages of development. Additional tests to refine the test methodology, to identify the test measures and associated metrics, to determine preliminary safety benefits, and to demonstrate fleet applicability and consistency of test results are contemplated.

NHTSA also has begun collecting load cell data in offset barrier tests. Eleven tests have been conducted to date. Analysis of the results will be used to examine the applicability of the average height of force (AHOF) calculation from offset testing. Also, test data will be analyzed to determine the feasibility of specifying a maximum total force under these crash conditions to reduce aggressiveness of vehicles.

NHTSA is also continuing the development of an MDB (moving deformable barrier) instrumented with a load cell array behind a deformable honeycomb face for evaluating a vehicle's aggressivity.

For additional information contact William T. Hollowell, (202) 366-4850.

j) EuroSID-2 evaluation (what has NHTSA found in its testing)

Response:

Since the testing reported on at the 2001 International Technical Conference on the Enhanced Safety of Vehicles, NHTSA's Office of Research and Development has performed 27 full-scale crash tests with the ES-2 dummy. Results from 23 of those tests were presented at the Government/ Industry Meeting in May 2002, and the presentation material can be accessed from the NHTSA's Web site at URL http://www-nrd.nhtsa.dot.gov/departments/nrd-01/presentations/sae.html. The recent five tests were all performed in a forward oblique side impact pole test configuration at 20 mph. In summary, "flat top" in the ES-2 rib deflection responses due to rib binding was not observed in these tests. The dummy was shown to be durable. The dummy demonstrated the ability to evaluate head protection in pole side impacts. Also, the ES-2 exceeded the European thoracic and abdominal injury thresholds in some vehicles, while the SID dummy in similar crash tests did not exceed the Federal Motor Vehicle Safety Standard No. 214 thresholds. However, the ES-2 back plate-to-seat interaction and the force transmitted through the back plate is an issue which is being researched at this time.

For additional information contact Randa Radwan Samaha, (202) 366-4850.