

Statement of

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Before the

SUBCOMMITTEE ON AVIATION AND TRANSPORTATION  
COMMITTEE ON SCIENCE AND TECHNOLOGY

on

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Mr. Chairman and Members of the Subcommittee:

In exercising responsibility for the administration of the National Traffic and Motor Vehicle Safety Act and the Highway Safety Act of 1966, the National Highway Traffic Safety Administration (NHTSA) has vigorously stressed the importance of a broadly-based program of research, development, data acquisition, and analysis designed to emphasize those technological aspects of traffic and motor vehicle safety which show the greatest promise for reducing injuries and saving lives.

The major thrust of our research program in the Motor Vehicle area is to expand the technology base to support future rulemaking. The application of a better technology base to rulemaking will increasingly provide reasonable levels of crash protection for occupants of smaller cars such as compacts and subcompacts. The standard or family-sized sedan has already attained this basic level of protection. In the traffic safety area, important work is underway in Alcohol Countermeasures to get the drunk driver off the road; Advanced Inspection Techniques to reduce traffic accidents caused by motor vehicle equipment failures; and Driver Programs to upgrade driver licensing, behavior, and performance. In the Statistics and Analysis area, a major effort is underway to upgrade the level of data obtained from automobile accidents. This is reflected

### Highlights of Other Research Areas

° Safety Research Laboratory - The laboratory is the organization within the NHTSA where actual hands-on research is conducted. During FY 1977, SRL will develop a flat track test method to simulate mountain driving based on the braking system field data gathered in FY 1976. An inertia dynamometer laboratory test will be developed for a safety standard for replacement brake shoes or pads for hydraulic braking systems. In addition, the dynamometer will be used to evaluate the safety performance of air braked systems. A fatigue test for air brake hoses will also be completed.

Human volunteer experiments will be conducted to determine the human response to impact of the knee. Also, a new magnetic clutch will be installed in an anthropomorphic dummy to simulate the human response in sled tests.

The cornering traction performance of tires will be measured using the newly developed mobile tire traction dynamometer of SRL. The feasibility of establishing treadwear courses other than the single course established by NHTSA at San Angelo will be explored. An instrumented vehicle will attempt to characterize the course severity parameters for a grading system. The feasibility of establishing skid pads for traction grading at other locations will also be verified.

° Crash Survivability - Work on lightweight subcompact cars (1,500 to 2,000 pounds) is being continued and emphasized in FY 1977. To date, several production lightweight subcompact vehicles have been tested in flat-barrier and car-to-car impacts. Tests indicate that the structure of the vehicles generally performs well in flat-barrier impacts up to 40 mph. Unfortunately, the structure of the smaller car (1,500 to 2,000 pounds) does not perform well in car-to-car impacts with larger (4,000 to 4,500 pounds) vehicles. Oblique-side impacts and offset frontal impacts result in excessive intrusion of the occupant compartment at relatively low impact speeds (30 mph per vehicle).

Since the car-to-car impact is more representative of real-world accidents, research is required to determine if weight conscious, economical methods can be practically applied to improve **crash survivability of the smaller cars.**

During FY 1977, the Biomechanics Program will continue the established multifaceted efforts to develop valid injury criteria which can be specified in rulemaking actions; to develop new, more realistic and reliable dummy subsystems of the neck, shoulder, and spine which can be incorporated in the new generation of dummies; and to develop vehicle modification and compliance techniques for pedestrian impact injury mitigation.

° Operating Systems - In FY 1977, the main thrust of the Vehicle Handling Program will be research on two classes of vehicles which are increasing in numbers on the Nation's highways. These are articulated vehicles (trucks) and the smaller passenger vehicles.

Dynamics of articulated vehicles and their aerodynamic effects on other vehicles have not been adequately addressed and will be the subject of the FY 1977 program.

The trend to smaller passenger vehicles has signalled the need for increased research in this area. The handling dynamics of small passenger vehicles is more critical than full-size vehicles because the passenger load becomes a large percentage of the small vehicle's loaded weight. This factor is especially critical in brake system design where wheel lock-up must be avoided to retain stability and handling. This subject will be addressed in the FY 1977 program.

Collision avoidance radar braking work will be continued to determine the feasibility and practicality of original equipment installation and the retrofitting of all passenger cars. This type of braking system has the potential for eliminating accidents caused by no braking or late brake actuation.

° Tires - Emphasis will continue on the utilization of Non-Destructive Testing (NDT) techniques to truck and bus tires (new and retread) to update compliance test methods and appropriate FMVSS; and to correlate through road tests the validity of flaws detected by NDT and their tire failure potential.

° Research Safety Vehicle - The objective of the RSV Program is to advance vehicle safety performance for the mid-1980's using a total systems approach. Phase I, Program Definition and Performance Specification Development has been completed. Phase II, Detailed Design Development, will be completed during the first quarter of FY 1977 with the preparation of a completed set of design documentation and a final report describing all Phase II activities and findings. A detailed evaluation of the Phase II conclusions and resultant designs will be conducted. Contracts for fabrication of test articles (i.e., Phase III) will be awarded to both Phase II contractors. The two Phase II contractors are using fundamentally different conceptual approaches. These distinctly different approaches offer a unique opportunity to establish advanced safety levels in two weight classes and to resolve critical vehicle-to-vehicle crash compatibility problems simultaneously.

° Driver Licensing - In FY 1977, the emphasis will shift to the skill and perceptual requirements for an integrated driver licensing and improvement system. In the past, the emphasis has been on the vision and knowledge requirements for safe driving.

° Pedestrian and Bicyclist Safety - During FY 1977, research will be initiated on the development and test of countermeasure possibilities for selected types of urban intersection pedestrian accidents; for selected rural pedestrian accidents; for model safety regulations for bicycles; and for the utilization of community and parental resources for safeguarding child pedestrians at play.

° Driver/Vehicle Interaction - In the lighting area, continued emphasis will be placed on field testing of innovative rear lighting and signalling concepts, thereby completing this phase of testing of acceleration lights and high-mounted brake and turn signals. The hazard/warning/special lighting requirements of emergency vehicles and school buses will be addressed in a research project initiated this year. In the visibility area, research will be directed towards a field validation of the specifications for a total vehicle visibility system which will encompass the driver's combined direct, indirect, and peripheral vision capabilities as opposed to being treated as separate capabilities and covered by separate FMVSS as they now are.

° Vehicles-In-Use - Work will be directed at truck, bus, and motorcycle degradation (rather than passenger cars) and the effects of defects and degradation of these vehicles on their current and future performance. The projects will reveal the magnitude of the safety problem associated with the in-use degradation of these vehicles and will result in initial inspection criteria and recommendations for areas of future research.

° Drugs and Alcohol - Current research indicates that drivers who have used certain drugs (marihuana and barbituates) may be overinvolved in highway accidents and may be a significant contributing factor to such accidents. During FY 1977, research in drug activities will seek to determine (1) the incidence and overrepresentation of specific drugs in injury accidents, (2) the impairment of driver performance by such drugs, and (3) target groups and countermeasure possibilities. In FY 1977, the emphasis in alcohol research will shift from the analysis of the alcohol

related casualty problem to the study of the feasibility of developing countermeasures in the areas of enforcement, and special projects on drunk driver warning systems and sobering agents. The new effort is directed at (1) using increased apprehension of individuals Driving While Intoxicated (DWI) and (2) increased awareness of drivers of DWI apprehension, as a general deterrent to DWI.

° Two-Wheeled Vehicle Rider Safety - Program activity will peak in FY 1977 with an update of the curriculum specifications (for Beginning Rider Course materials used by the Motorcycle Safety Foundation) based on the results of the NHTSA/MSF (Motorcycle Safety Foundation) Pilot Test Activities. In the licensing area, development of the In-Traffic Test will be completed and advanced approaches to motorcyclist testing and remedial training will be investigated.

° Safety Belt Usage - Work is being continued and expanded on safety belt usage surveys. During FY 1977, this nationwide survey will include model year 1977 and 1978 cars equipped with passive and uni-belt systems. Basic information is being gathered as to what people's habits are, their motivations and sources of discontent. The information is then made available to people interested in seat-belt-use programs.

° Advanced Inspection Techniques - During FY 1977, two main projects will be pursued: (1) the development of cost/effective **on vehicle shock-absorber** inspection equipment and (2) the development of a prototype front-end steering/suspension inspection system for front-end geometry and system free-play/looseness. The results of both projects will be used to verify **feasibility, and to provide specifications for inspection equipment manufacturers and guidelines for State inspection programs.**

° Accident Investigation - During FY 1977, the design and field testing of the National Accident Sampling System (NASS) will be completed. Implementation of the system is planned to begin in FY 1978. NASS will be structured around a team investigation concept and will provide reliable, consistent data on accident severity and accident and injury causation **which is critically needed for the development and evaluation of future motor vehicle standards.**

° Information Systems - In FY 1977, the National Accident Reporting System (NARS) will move from pilot project status to full implementation. The NARS will be a continuous sample of all personal injury and property damage accidents involving towaways. Data from this system will be used by the Administration to evaluate the effectiveness of countermeasure programs, determine problem areas, and track accident trends.

**CONCLUSION:**

Since the inception of the National Highway Traffic Safety Administration's Program in 1967, the rate of fatalities per 100 million vehicle miles has steadily declined each year. This reflects the continuing impact of safer cars on the road and the Administration's support of the national 55-Mile Per Hour Speed Limit. The role of Research and Development is to support the efforts of the NHTSA by studying and developing those measures which appear to hold the greatest value in reducing injuries and saving lives.