

PART IV - RECOMMENDATIONS

The National Transportation Safety Board recommends that:

1. The Bureau of Public Roads, FHWA, consider the establishment and enforcement of a firm requirement that all existing highways, Federally aided or not, which are brought into the Interstate System must meet current Federally approved highway design standards, prior to being designated as Interstate routes and given Interstate numbers. Highway users in general should not have the experience of being able to steer one wheel onto a shoulder and return safely on some parts of the Interstate System and finding a hazardous result on another part of the Interstate System. The designation of a highway as an Interstate route should presume that such highway meets all basic design standards for safety. This requirement should include a standard for the slope of shoulder areas or curves relative to the superelevation of adjacent pavement (.07 foot per foot maximum differential in cross-slope break).
2. Pending the establishment and enforcement of the requirement recommended above, motorists should be informed by signs of hazards created by sub-standard conditions, and the Pennsylvania Turnpike Authority and other affected turnpike and highway authorities of the several States and the District of Columbia should consider a requirement that salting and cindering of highways during frosting, icing, or snow conditions be extended to include the outer shoulder area of highway curves wherever shoulder design is below the AASHO standard.
3. The Bureau of Public Roads, FHWA, consider the feasibility of requiring some sort of visual reference, such as guardrails or reflectors, along the outer edges of all curves on Federally aided and Interstate numbered highways, so that drivers may maintain visual reference with the highway during periods of reduced visibility, reduced contrast between roadway and shoulder, or when other environmental conditions may increase the difficulty of determining vehicle alignment or position on the highway. Such visual references are used on many highways, but are not a requirement.

The Federal Highway Administration take additional steps toward making available to the bus-traveling public convenient restraints against being ejected from their seats in a crash, such as are available to motorists and airline passengers, so that passengers will not be denied the opportunity to employ them if they so desire. In the Board's view, a decision to make available suitable restraints which would reduce injuries is not dependent upon a showing that all passengers would use them, nor should it be limited by the fact that past bus passenger seat designs do not accommodate the lap belt type of restraint. The retention of passengers in their seats during the crash phase is clearly desirable, as indicated by this case and others, and making restraints available is a first step in obtaining their use. The Bureau of Motor Carrier Safety on June 28, 1969, proposed rulemaking (Docket MC-11) requiring seat restraints and their use for drivers of interstate carriers, and the opportunity to employ some form of restraint should not be withheld from passengers.

5. The National Highway Safety Bureau, FHWA, study the feasibility and practicality of a standard for passenger buses requiring that surfaces overhead of passengers, including roof linings, mouldings, parcel or luggage shelves, edges and support hardware be designed so as to reduce or prevent direct contact injuries in roll-over and upset accidents, and that such areas resist separation or fracture of a type which would expose edges to passengers. This protection will continue to be of importance in the absence of passenger restraints, currently not required.
6. The National Highway Safety Bureau and the Bureau of Motor Carrier Safety, in connection with their research programs and standards work in regard to motor vehicle handling properties, consider whether the combination of relatively slow steering ratios, and the absence of any indication to the driver of direction of the vehicle front steering wheels may in some vehicles tend to create lags of time response and overcorrections in the driver-vehicle-highway control loop, irrespective of the skill of the driver. A goal of such research and standards work should be to insure that drivers are able

to determine the direction of front wheels and the necessary steering wheel movement, not only for small movements necessary in ordinary driving, but also for larger movements typically needed to recover from emergency situations. .

7. The manufacturers and prospective purchasers of high-speed intercity buses review the designs of vehicle instruments and controls used by the driver from the viewpoint of correcting designs and layouts which may impose upon the driver more simultaneous tasks than he can execute. It must be remembered that high-speed vehicle driving requires almost uninterrupted observation of the road. Controls which require direct visual observation and large angular eye movement to operate correctly, or require unusual driver attitude to operate, or which can be confused with other nearby controls when located only by touch, or which require close reading of placards, all tend to divert the driver's attention from the road. It is further recommended that where existing vehicles having such control problems must continue to be operated, drivers be specifically warned of any tendency of the operation to distract attention.
8. The National Highway Safety Bureau continue its studies toward the development of techniques for standards for vehicle instruments and controls with special attention to the problems posed by the high-speed intercity bus situation, which requires road vigilance equal to that of a passenger car or truck, but with the necessity to operate a significantly larger number of auxiliary controls while moving at high speed.
9. The Federal Highway Administration review our recommendation in the report of the Interstate bus-auto collision near Baker, California, to "change the basis of its regulatory requirements intended to insure escape from buses so that they are based upon tests of performance of occupants in escaping from buses standing or lying in all basic attitudes. In the development of test criteria, it is suggested that consideration be given to test procedures employed by the Federal Aviation Administration for the regulation of the adequacy of escape techniques and systems.

Further, consideration should be given to adopting for buses, the airline practice of placing emergency escape instructions at each passenger location. It is further recommended that necessary regulations be expedited to insure that no new types of buses go into service which have not been tested to insure that all occupants can escape rapidly when the bus is in any of its basic attitudes after a crash. This recommendation refers to Docket 2-10 of the National Highway Safety Bureau as well as to Motor Carrier Safety Regulations."

BY THE NATIONAL TRANSPORTATION SAFETY BOARD:

/s/ JOHN H. REED
Chairman

/s/ OSCAR M. LAUREL
Member

/s/ FRANCIS H. McADAMS
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/s/ LOUIS M. THAYER
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/s/ ISABEL A. BURGESS
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