National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: May 25, 2001

In reply refer to: H-01-16

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American Trucking Associations, Inc.
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Mr. Jim Johnston
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President and Chief Executive Officer
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The National Transportation Safety Board is an independent Federal agency charged by Congress with investigating transportation accidents, determining their probable cause, and making recommendations to prevent similar accidents from occurring. We are providing the following information to urge your organization to take action on the safety recommendation in this letter. The Safety Board is vitally interested in this recommendation because it is designed to prevent accidents and save lives.

This recommendation addresses training commercial operators in the technological solutions for the prevention of rear-end collisions. The recommendation is derived from the Safety Board's special investigation report *Vehicle- and Infrastructure-Based Technology for the Prevention of Rear-End Collisions*[1] and is consistent with the evidence we found and the analysis we performed. As a result of this investigation, the Safety Board has issued 11 safety recommendations, 1 of which is addressed to the American Trucking Associations, Inc., the Owner-Operator Independent Driver Association, and the National Private Truck Council. Information supporting this recommendation is discussed below. The Safety Board would appreciate a response from you within 90 days addressing the actions you have taken or intend to take to implement our recommendation.

The Safety Board has concluded that education in the use and benefits of effective collision warning systems (CWSs) and adaptive cruise controls (ACCs) is critical to their

[1] For more information, read: National Transportation Safety Board, *Vehicle- and Infrastructure-Based Technology for the Prevention of Rear-End Collisions*, Special Investigation Report NTSB/SIR-01/01 (Washington, DC: NTSB, 2001).

acceptance by the driving public. The object of training is to ensure that specific skills or procedures are learned. Training can occur through verbal instruction, demonstration, guidance, practice,[2] or the use of videos or computers. Training is one of the standard methods used to aid people in acquiring safe behavioral practices.[3]

According to the president of U.S. Xpress Enterprises, Inc., that company provides its drivers with extensive training on all the technologies that are employed in its trucks. For example, a driver will receive orientation on the ACC so he understands what happens if the truck begins to slow down, why the truck is slowing (because a vehicle is ahead), and how the driver should react. Recurrent training is also provided and is considered by U.S. Xpress to be necessary for drivers to be successful and to understand the technology.

Training has been provided in the operational tests that have been conducted to date with the ACC or the CWS. In the ACC operational test conducted by the National Highway Traffic Safety Administration and the University of Michigan Transportation Research Institute in 1996 and 1997, the drivers received a limited introduction to the functions and capabilities of the system. This understanding allowed the drivers to use the ACC in the manner for which it was intended and made them aware of the necessity of intervening when harder braking was necessary.[4] The drivers surveyed during a U.S. Army field test believed that training was imperative because the systems were not intuitive without training.[5]

A July 1991 accident investigated by the Safety Board demonstrates the necessity of training on new technologies. A 1989 school bus, descending a two-lane roadway near Palm Springs, California, increased speed, left the road, plunged down an embankment and collided with several large boulders. The busdriver and 6 passengers were killed, and 47 other passengers were injured.[6] The bus engine was equipped with a then-new automatic upshift overspeed protection feature[7] to prevent engine and transmission damage. While information on this feature was provided in the operator manual for the transmission, neither the training coordinator nor the busdriver's behind-the-wheel instructor had seen the operator manual, and the instructor was not aware of the automatic upshift capability. The busdriver training program did not discuss the upshift feature. The Safety Board concluded that although the automatic transmission upshift feature did not cause or contribute to this accident, an upshift occurrence may be the first warning that the transmission can no longer help maintain speed control and immediate action must be taken to reduce speed to effect a downshift back to the desired gear range. The Safety

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[2] Gavriel Salvendy, ed., *Handbook of Human Factors* (New York: John Wiley and Sons, Inc., 1987).

[3] Mark S. Sanders and Ernest J. McCormick, *Human Factors in Engineering and Design*, 7th ed. (McGraw Hill, Inc., 1993).

[4] U.S. Department of Transportation, *Intelligent Cruise Control Field Operational Test Final Report, May 1998*, DOT-HS-808-849 (Springfield, VA: NTIS).

[5] K. Luckscheiter, "National Automotive Center Collision Warning Safety Convoy," *U.S. Army Tank-Automotive and Armaments Command* (Warren, Michigan: September 1996).

[6] National Transportation Safety Board, *Mayflower Contract Services, Inc., Tour Bus Plunge From Tramway Road and Overturn Crash Near Palm Springs, California, July 31, 1991*, Highway Accident Report NTSB/HAR-93/01 (Washington, DC: NTSB, 1993).

[7] This feature upshifts the transmission to the next higher gear if the vehicle momentum on a downgrade drives the engine beyond its maximum governed rpm setting. The engine also cannot be downshifted until the speed is brought into the gear's speed range.

Board advised that the training curriculum be expanded to include automatic transmission upshift characteristics and proper operation in mountainous terrain.

The importance of training cannot be overstated, based on the experience of U.S. Xpress, the operational tests, and previous Safety Board accident investigations. Training is critical to the understanding of complex technical system functionalities so that drivers can respond adequately when the technology is in use. The Safety Board has concluded that commercial drivers need to be oriented to the use of CWSs and ACCs in order to understand system capabilities, how the driver interface works, and how the system functions.

Therefore, the National Transportation Safety Board recommends that the American Trucking Associations, Inc.; the National Private Truck Council; and the Owner-Operator Independent Driver Association:

> Encourage your members to obtain or provide, or both, training to those drivers who operate collision warning system- or adaptive cruise control-equipped trucks. (H-01-16)

The Safety Board also issued safety recommendations to the U.S. Department of Transportation; the National Highway Traffic Safety Administration; the Federal Highway Administration; automobile, motorcoach, and truck manufacturers; and the Intelligent Transportation Society of America. In your response to the recommendation in this letter, please refer to Safety Recommendation H-01-16. If you need additional information, you may call (202) 314-6440.

Acting Chairman CARMODY and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in this recommendation.

Original signed

By: Carol J. Carmody
Acting Chairman