

LOG H-ESSA



## National Transportation Safety Board

Washington, D.C. 20594

### Safety Recommendation

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**Date:** December 13, 1995

**In Reply Refer To:** H-95-45

Honorable Ricardo Martinez  
Administrator  
National Highway Traffic Safety Association  
Washington, DC 20590

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About 1:50 a.m. on Monday, January 9, 1995, a multiple-vehicle rear-end collision occurred during localized fog at milepost 118 on Interstate 40 near Menifee, Arkansas. The collision sequence initiated when an uninvolved vehicle and the accident lead vehicle entered dense fog. As the lead vehicle reportedly slowed from 65 miles per hour (mph) to between 35 and 40 mph, it was struck in the rear. Subsequent collisions occurred as vehicles drove into the wreckage area at speeds varying from 15 to 60 mph. The accident eventually involved eight loaded truck tractor semitrailer combinations and one light-duty delivery van. Eight vehicles were occupied by a driver only, and one vehicle had a driver and a codriver. Three truckdrivers, the codriver, and the van driver were killed. One truckdriver received a minor injury, and four truckdrivers were not injured.<sup>1</sup>

The surviving drivers described the fog as "white out" and "very, very thick, the thickest fog ever." Other drivers, who were not involved in the accident, reported being unable to see the end of the hood (perhaps 8 feet) and to observe the lane markings from the truck cab looking straight down (perhaps 10 feet). Their descriptions indicate severely limited visibility. According to both driver 4 and driver 5, the emergency flashers were activated on the vehicle 4 semitrailer. Driver 5 stated that he saw the emergency flashers on the preceding vehicle, reduced his speed to between 15 and 20 mph, and managed to stop just short of striking vehicle 4. It is likely his ability to see vehicle 4 and react was enhanced by its hazard flashers.

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<sup>1</sup>For more detailed information, read Highway Accident Report—*Multiple-Vehicle Collision with Fire during Fog near Milepost 118 on Interstate 40, Menifee, Arkansas, on January 9, 1995/Special Investigation of Collision Warning Technology* (NTSB/HAR-95/03).

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The April 1995 National Transportation Safety Board investigative conference Mobile Collision Warning Technology for Low Visibility/Low Awareness Collisions observed that the tail lamp low luminance of 2-18 candela does not increase the visibility of a vehicle in typical daylight fog conditions. Flasher lamps have a luminance of 80-300 candela. Researchers indicated that in daylight when the nominal visibility range of a vehicle is 300 feet, the use of flasher lamps with a luminance of 80 candela can increase the visibility range to 450 feet. The Safety Board concluded that the use of four-way hazard flashers can increase the visibility of stopped or slow-moving vehicles in fog conditions. The increased visibility allowed driver 5 to see and avoid a collision with the rear of vehicle 4. The Safety Board also concluded that the use of emergency flashers by vehicles 1, 2, or 3 may have allowed the following drivers enough time to have avoided striking preceding vehicles.

The measure of the tendency for an object to be easily seen is conspicuity. However, conspicuity does not refer simply to the physical state of an object or hazard but has another component. For the hazard to be perceived, it must be filtered through the senses and past experiences of the driver. A driver can begin the process that leads to addressing a hazard only when that individual attends to sensory input. The increased luminance of hazard flashers increases visibility about 50 percent over taillight use alone. The low beams of an oncoming vehicle can be seen at more than twice the distance of mere taillights. As the fog bank density increases, nominal visibility decreases and the visibility of various vehicle lights decreases proportionately. The use of hazard flashers on vehicles in fog could have as beneficial an effect for hazard perception as separate fog lamps on the rear of vehicles, which might mask brake lights.

The safety benefits that may be achieved by connecting the center high-mounted stop lamps to the flasher system were additionally discussed at the investigative conference. This feature would provide the driver who was overtaking another vehicle with additional warning and some size concept of the vehicle that was being overtaken. One motor coach manufacturer has considered wiring the overhead rear brake light on its buses into the four-way emergency flasher system as a modification to furnish an additional sight reference point for the driver following behind. The Safety Board concludes that incorporation of the high-mounted stop lamp into the hazard-flasher system may enhance the visibility of those light systems. Consequently, the Safety Board believes that the National Highway Traffic Safety Administration should assess the possible safety benefits to low visibility conspicuity provided by incorporation of the high-mounted brake light into the four-way emergency flasher system.

Therefore, the National Transportation Safety Board recommends that the National Highway Traffic Safety Administration:

Assess, within 2 years, the possible safety benefits to low visibility conspicuity provided by incorporation of the high-mounted brake light into the four-way emergency flasher system. (Class II, Priority Action) (H-95-45)

Also, the Safety Board issued Safety Recommendations H-95-44 to the U.S. Department of Transportation; H-95-46 to the Federal Communications Commission; H-95-47 to the 50 States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, and the Territories; H-95-48 to the Telecommunications Industry Association; H-95-49 to the Intelligent Transportation Society of America; and H-95-50 to the American Association of Motor Vehicle Administrators. If you need additional information, you may call (202) 382-6850.

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT and GOGLIA concurred in this recommendation.

By:  Hall  
Chairman