

Log # H 589A



# National Transportation Safety Board

Washington, D.C. 20594

## Safety Recommendation

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Date: NOV 14 1995

In Reply Refer To: H-96-43 and -44

Honorable Ricardo Martinez  
Administrator  
National Highway Traffic Safety Administration  
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Washington, D.C. 20590

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On October 25, 1995, at 7:10 a.m., the Northeast Illinois Regional Commuter Railroad Corporation (d/b/a Metropolitan Rail) express commuter train 624 struck the rear left side of a stopped Transportation Joint Agreement School District 47/155 school bus at a railroad/highway grade crossing in Fox River Grove, Illinois.<sup>1</sup> After the school bus crossed the railroad tracks and stopped for a red traffic signal, its rear extended about 3 feet into the path of the train. Of the 35 school bus passengers, 7, 24, and 4 passengers sustained fatal, serious to minor, and no injuries, respectively; the busdriver received minor injuries. The 120 passengers and 3 crewmembers aboard the commuter train were uninjured.

The National Transportation Safety Board found during its investigation that Illinois State law prohibits driving onto a railroad grade crossing unless there is sufficient space on the other side of the grade crossing to accommodate the vehicle without obstructing rail traffic. After the road widening was completed at the U.S. Route 14 (US 14) and Algonquin Road intersection in 1989, the distances from the northern rail and crossing gate to the stop line were 35 and 20 feet, respectively. The Illinois Department of Transportation (IDOT) design for the road widening failed to allow for space in the queuing area sufficient to accommodate vehicles such as dump trucks, tractor-semitrailers, mobile homes, and school and commercial buses. The accident school busdriver could have known about the short queuing area through a school district route hazard identification system, had such a system been available. However, other motorists would not have had the advantage of using a school district hazard identification system, even had one been in place.

Because no road signs were posted to provide information on the available space in the queuing area, these other motorists might be unable to determine whether the queuing area could

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<sup>1</sup>For more information, see Highway/Railroad Accident Report—*Collision of Northeast Illinois Regional Commuter Railroad Corporation (METRA) Train and Transportation Joint Agreement School District 47/155 School Bus at Railroad/Highway Grade Crossing in Fox River Grove, Illinois, on October 25, 1995* (NTSB/HAR-96/02).

adequately accommodate their vehicles. IDOT could have posted signs indicating the length of the queuing area, prohibiting motorists with vehicles in excess of that length from crossing the tracks during a red indication, and instructing those motorists to wait on the south side of the tracks for a green indication. Another traffic signal also could have been installed to coordinate with the intersection light. IDOT has installed a stop line, traffic signs, and traffic signals on the south side of the grade crossing since the collision. Therefore, the Safety Board concludes that IDOT had not employed sufficient measures before the accident to prevent vehicles from encroaching on the railroad tracks while stopped at the north side of the grade crossing.

The distance between the crossing gate and stop line on the north side of Algonquin Road was about 20 feet. However, the school bus was 38 feet 4 inches long and the overhang of the train was about 3 feet on each side; therefore, at least 3 feet of the school bus was in the path of the train. The right and left side of the bus were, respectively, overlapping the tracks and in the path of the train because the bus was at a 75-degree angle to the tracks. No evidence indicates that the school busdriver ever attempted to determine whether her bus had adequate space. She stated that, "It never entered my mind that there wasn't enough room for the bus to fit," and that she did not know the rear of her bus was in the train path. The other school busdrivers who had traversed this crossing knew from their experience that the space was too short for a school bus, and they would stop on the south side of the railroad crossing.

The Safety Board found during its investigation that no specific guidance is provided at the national level about vehicle positioning and available space at railroad/highway grade crossings. Operation Lifesaver, Inc., (OL)<sup>2</sup> is developing a training videotape that addresses school bus vehicle positioning at railroad/highway grade crossings, and it should provide valuable guidance on this subject to those school busdrivers who receive OL training. However, many other school busdrivers throughout the United States who are exposed to short queuing areas near railroad/highway grade crossings may not be provided with the OL information.

The Safety Board investigation of a 1993 collision<sup>3</sup> in Fort Lauderdale, Florida, involving a gasoline tank truck and a train underscores the necessity that a motorist understand his or her vehicle positioning when stopped at a railroad crossing. In this case, the truckdriver was stopped in congested traffic at a work zone at a railroad crossing when the gate came down and struck his truck hood. As described by the witnesses, he was positioned such that the clearance between the truck and the train was about 5 feet. However, he proceeded to try and drive across the tracks and was struck by a passenger train. A fire subsequently erupted that killed the truckdriver and five motorists in the queue of vehicles at the crossing. As a result of postaccident sight tests, the Safety Board concluded that the truckdriver probably had not been able to see the track and may have thought that he had encroached on it and needed to move forward.

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<sup>2</sup>An active, continuous public information and education program designed to help prevent and reduce railroad/highway grade crossing accidents. The OL is sponsored cooperatively by Federal, State, and local government agencies, highway safety organizations, and the Nation's railroads.

<sup>3</sup>Highway Accident Report--*Gasoline Tank Truck/Amtrak Train Collision and Fire in Fort Lauderdale, Florida, March 17, 1993* (NTSB/HAR-94/01).

This collision and the March 1993 Fort Lauderdale, Florida, accident indicate that motorists often do not recognize the position of a vehicle in relation to an approaching train at a railroad/highway grade crossing. Automatic gates in the down position and stop lines offer visual references to define a train right-of-way. The *Manual on Uniform Traffic Control Devices for Streets and Highways*<sup>4</sup> specifies the location of the railroad warning devices and the stop lines relative to the railroad tracks. However, not all grade crossings have these visual references. These accidents illustrate that motorists may not be aware that they are in the train path, even at crossings equipped with warning devices and stop lines.

According to the school busdriver and the passengers in the front of the bus, they had not seen the crossing warning devices activate or the train approaching, nor had they heard the crossing gate strike the bus. The front of the bus had likely passed the warning light pole before the lights began flashing. Once positioned forward of visual cues, the busdriver and forward passengers would have had to look rearward at an angle to have seen the danger cues, which they did not. The passengers in the rear of the bus who first saw the crossing gate strike the bus initially joked about it. However, when they saw the train coming and heard the horn blowing, they began yelling at the busdriver to move the bus. As more passengers became aware of the approaching train and began yelling, the noise level in the bus increased and caught the attention of the busdriver and passengers up front, who did not initially grasp what those yelling were attempting to convey. The busdriver looked in the rearview mirror at this time; hence, the increased sound likely had the unintended consequence of distracting her attention from the traffic signal, which displayed the green indication for 2 to 6 seconds before the collision.

Because the busdriver did not realize that her bus was in the path of the train, whether she would have reacted to the crossing warning devices had she seen and heard them activate is unknown. Had the school busdriver discerned the combined visual and audible warnings that a train was approaching, she might have had sufficient time to recognize the hazard and move the bus before impact.

From the school district's experience, playing the AM/FM radio on a school bus had a pacifying effect on its passengers. One of the eight radio speakers was positioned on the left side wall next to the busdriver's head. Safety Board tests indicated that when the radio was turned on, the busdriver could not hear the train horn. Regardless of the possible passenger pacification safety benefits that may result from playing the radio on a school bus, placing a radio speaker adjacent to a busdriver's head is unnecessary to achieve this effect.

The Safety Board recognizes that perforated ceiling liners, as on the accident school bus, probably provide a benefit by reducing the noise level and thereby lessening the distractions for busdrivers. However, tests conducted by both the manufacturer and the Safety Board revealed that in a bus with a perforated ceiling liner, the sounds from the rear to the front of the bus were

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<sup>4</sup>The national standard governing traffic control devices on streets or highways placed there by the authority of a public body or official having jurisdiction to regulate, warn, or guide traffic. Published by the U.S. Department of Transportation, Federal Highway Administration, 1988

reduced as much as 25 decibels compared with a bus without the liner. The perforated ceiling liner reduced the volume of the train horn and the warnings from the bus passengers. The Safety Board is unable to determine, as a result of this accident, whether the sound attenuation materials affected the busdriver's ability to discern the audible warnings.

Based on the foregoing information, the National Transportation Safety Board makes the following safety recommendations to the National Highway Traffic Safety Administration:

Determine what effect school bus sound attenuation materials have on the ability of a busdriver to discern both interior and exterior audible warnings. (H-96-43)

Disseminate safety information, in cooperation with the Federal Highway Administration and the Operation Lifesaver, Inc., once guidelines are developed, to national, State, police, public service, and safety agencies for them to use in developing a training and education module that informs motorists how to recognize the area (zone) that a train and/or its cargo may occupy on the track or tracks of a railroad grade crossing. (H-96-44)

The National Transportation Safety Board is also making safety recommendations to the U.S. Secretary of Transportation, the Federal Highway Administration, the Federal Railroad Administration, the State of Illinois, the Illinois Department of Transportation, the Transportation Joint Agreement School District 47/155, the National Association of State Directors of Pupil Transportation Services, the American Association of State Highway and Transportation Officials, the National Association of County Engineers, the American Public Works Association, the Institute of Transportation Engineers, the Association of American Railroads, the American Short Line Railroad Association, the American Public Transit Association, and Operation Lifesaver, Inc. (The Safety Board issued urgent action recommendations following this accident to the Federal Highway Administration, the Federal Railroad Administration, and the State Directors of Transportation.)

The Safety Board is interested in any action taken as a result of its safety recommendations. Therefore, it would appreciate a response from you regarding action taken or contemplated with respect to the recommendations in this letter. Please refer to Safety Recommendations H-96-43 and -44. If you have any questions, you may call (202) 314-6448.

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in these recommendations.

By:   
Jim Hall  
Chairman