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National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: NOV 14 1996

In Reply Refer To: H-96-49 through -53

Mr. Spencer Holder, President
National Association of State Directors
of Pupil Transportation Services
No. 4 Capitol Mall
Room 204-A
Little Rock, Arkansas 72201

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.[1] 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.

Investigation by the National Transportation Safety Board found that the school busdriver was unfamiliar with the route that included the queuing area and the traffic light sequence at the intersection of Algonquin Road and U.S. Route 14. She stated that she stopped the bus on the south side of the tracks, did not see any trains or the crossing warning devices activated, and then slowly crossed the railroad tracks. She added that the traffic light for Algonquin Road was displaying a red indication and she believed that she would need to proceed across the tracks to trip a sensor that would trigger the traffic light to display a green indication. The busdriver said that she drove over the stop line to wait for the light to change.

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

[1]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).

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 investigation of a 1993 collision[2] in Fort Lauderdale, Florida, involving a gasoline tank truck and a train underscores the necessity that motorists be able to recognize where their vehicle is positioned when they are 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 crossing gate came down and struck his truck hood. As described by 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. Had the truckdriver remained in the position under the crossing gate, he would have avoided the collision. 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.

The Illinois school busdriver training curriculum addresses the importance of recognizing the position of the school bus in relation to other vehicles and objects. No specific or practical instruction (except the road test administered when a driver first obtains a school busdriver permit) is provided to ensure that a busdriver understands positioning on the road. The school busdriver in this accident was trained and experienced, but she did not accurately judge the position of her vehicle and acknowledged that she did not know where the rear of her bus was in relation to the railroad tracks. Other drivers familiar with this route were aware of vehicle positioning, but not as a result of training. Therefore, the Safety Board concludes that the guidance provided in the Illinois school busdriver training curriculum about vehicle positioning in relation to the roadway is ineffective.

The Safety Board also 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)[3] 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.

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

[3]A public information program sponsored cooperatively by Federal, State, and local government agencies, highway safety organizations, and the railroads and designed to help prevent and reduce railroad/highway grade crossing accidents.

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 on the bus 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 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.

Although school bus routes should avoid crossing railroad tracks, a railroad grade crossing on this route could not be avoided because of the limited paths available to access the residential area that the school bus was serving. However, methods to identify railroad/highway grade crossings hazards can be employed, and the school district specified three procedures to identify hazards on its school bus routes. The school transportation director described these three procedures as 1) planning and monitoring the routes and consulting a commuter train schedule for those that crossed railroad tracks, 2) driving the route in his car after a hazard had been reported, and 3) noting hazards or unusual conditions on the back of the busdrivers' route map.

There are problems with these procedures. First, using a commuter train schedule to identify route hazards is an unreliable method because trains and buses do not always run on time, as evidenced in this accident. In addition, such schedules provide no information about freight train movements or the characteristics of trains and railroad grade crossings. Second, driving the routes can be an effective method of hazard evaluation if it is done routinely and not just occasionally. The transportation director could cite only one occasion during his 15 years of experience in which he drove a school bus route in response to a hazard report. This information indicates that this method of hazard identification was infrequently employed by the Transportation Joint Agreement School District 47/155. Finally, no notations about hazards or unusual conditions were found on the back of the accident route map or any other route map. The busdrivers familiar with the accident route had adopted strategies to avoid remaining on the tracks at Algonquin Road and an adjacent railroad crossing. However, these practices had been neither formalized as written instructions for busdrivers nor discussed by the busdrivers familiar with the route with other school busdrivers or school officials.

Although all busdrivers should be encouraged to report perceived hazards to school authorities, the school transportation director is responsible for periodically monitoring the school bus routes and the busdrivers. The Transportation Joint Agreement School District 47/155 transportation director stated that he monitored the school bus routes; however, he did not identify the Algonquin Road grade crossing as a hazard. The policy for drivers to share information on route hazards was not enforced and was, therefore, useless, as the regular and substitute drivers did not share their driving strategies with each other or school officials. Had a note with a special instruction about the short queuing area been provided, the accident busdriver might have stopped on the south side of the crossing to wait for a green signal indication and thus have avoided the accident. Therefore, the Safety Board concludes that the methods employed by the school district to identify and evaluate route hazards were ineffective. Furthermore, had the school district ensured that all school busdrivers exchanged information about any identified route hazards, such as the short queuing area, the accident busdriver might have avoided the collision.

The State of Illinois requires that school busdrivers be evaluated regularly, and the school transportation director is responsible for ensuring that school busdrivers are monitored and evaluated. The monitoring of substitute school busdrivers especially should be conducted because substitute drivers may not be familiar with the different bus routes, existing hazards, or bus equipment. Although the accident school busdriver had substituted frequently over the past years, her driving performance had not been monitored or evaluated. Had the regular and substitute school busdrivers been monitored during their morning routes, school officials might have been aware that the regular school busdrivers habitually stopped on the south side of the Algonquin Road grade crossing to wait for a green indication.

Based on the foregoing, the National Transportation Safety Board makes the following safety recommendations to the National Association of State Directors of Pupil Transportation Services:

Advise your members of the circumstances of this accident and provide guidance about vehicle positioning on the road, especially at railroad/highway grade crossings. (H-96-49)

Develop guidelines for the appropriate placement of radio speakers and use of radios on school buses and disseminate these guidelines to your members. (H-96-50)

Advise your members to check their school district buses and disable any radio speakers located immediately adjacent to school busdrivers' heads. (H-96-51)

Encourage your members to develop and implement a program for the identification of school bus route hazards and to routinely monitor and evaluate all regular and substitute school busdrivers. (H-96-52)

Advise your members to consider railroad/highway grade crossing accident histories or unusual roadway characteristics when establishing school bus routes. (H-96-53)

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 National Highway Traffic Safety Administration, the State of Illinois, the Illinois Department of Transportation, the Transportation Joint Agreement School District 47/155, 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 National Transportation Safety Board is an independent Federal agency with the statutory responsibility "to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations" (Public Law 93-633). 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-96-49 through -53. 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