

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: December 29, 1982

Forwarded to:

Honorable Forrest James, Jr.
Governor
State of Alabama
Montgomery, Alabama 36104

SAFETY RECOMMENDATION(S)

R-82-113 through -115

At 12:35 p.m., c.d.t., on October 6, 1982, a southbound Amtrak passenger train traveling at 79 mph through a railroad-highway grade crossing on County Road 42 in Hale County, Alabama, struck an empty westbound tractor semitrailer combination used to haul logs. The passenger cars were derailed, injuring 18 persons onboard the train. The truck driver was not hurt. The engineer stated that he sounded an audible signal in advance of the whistle post located 1,286 feet north of the centerline of County Road 42. The driver said he heard a signal when he was at the railroad-highway crossing pavement markings about 300 feet east of the track.

The on-site inspection revealed that railroad crossing signs, commonly identified as "crossbuck" signs, were located on each highway approach to the single track railroad owned by the Southern Railway Company; a Railroad Advance Warning sign was located 360 feet before the crossing on the right side of each approach on the 2-lane road; and a NO PASSING ZONE sign was located on the left side of each approach. Typical railroad-highway grade crossing pavement markings, consisting of an X, the letters RR, a double yellow centerline, and transverse markings (with the exception of a stop line) were painted on the highway. The centerline was faded. The westbound approach was downgrade (2 percent between a point 100 and 400 feet east of the tracks) and curved to the right (9° or a 637-foot radius).

Two days before the accident a diagnostic team consisting of two representatives from the State of Alabama, one representative from Southern Railway Company, and one representative from Hale County inspected the railroad-highway grade crossing. The team recommended flashing signals with bells and repainting of the stop line and centerline. Four years earlier, a diagnostic team also had recommended flashing signals and bells. Both reports noted limited sight distance from each highway approach with the most restricted sight distances noted in the northeast quadrant, the area over which the accident driver had to look in order to see a train.

There are 12 freight trains and two 79 mph Amtrak passenger trains through this crossing every day. The average daily highway traffic is estimated at 360 vehicles per day. The recent opening of a logging area west of the crossing increased large truck traffic (tractor semitrailers) by about 18 per day.

Sight distance tests were conducted under Safety Board supervision on October 8, 1982, using a Southern Railway Company locomotive and the undamaged tractor of the accident involved truck. The train was headed south and the tractor was headed west on County Road 42. The tests revealed that a person with an eye height equal to or even less than the 5-foot 10-inch tall Safety Board investigator, could not see an approaching train from his normal driving position, even if he turned his head toward the approaching train. (The driver was over 6 feet tall.) The superelevation (up to .05) on the right curve tilted the tractor to the right causing the roof of the cab to block the driver's line of sight. Even if the driver leaned forward and looked toward the train, his sight line would be restricted by the high embankment and vegetation within the sight triangle. To get a clear view down the track and have an unobstructed view of the train, the driver would have had to stop within 25 feet of the track.

The present Alabama doctrine of "STOP, LOOK AND LISTEN" and other sections of Alabama law require a driver to stop within 50 feet but not less than 15 feet from the nearest rail when confronted with certain conditions. One of the conditions require a driver to stop when an approaching train within 1,500 feet of the crossing emits an audible signal and is a hazard to such crossing. However, drivers do not always use such precaution and often fail to recognize the hazard associated with a railroad-highway crossing controlled only with a crossbuck and railroad advance warning signs. A U.S. Department of Transportation study entitled "Safety Features of Stop Signs at Rail-Highway Grade Crossings" (FHWA-RD-78-40), concluded that the addition of a stop sign, when added to the crossbuck display, conveys additional meaning and response, namely:

1. The crossing is more dangerous than other passive crossings.
2. A full stop is required to adequately detect and avoid trains.

The study which included both urban and rural locations indicated that when accident rates are corrected for vehicle/train exposure, 1/ stop sign crossings are safer than crossbuck crossings for exposure values above 100. (Exposure at this location is about 5,000.) The study concludes that a stop sign may reduce the hazards at the crossing if certain suggested requirements for its use are met. As quoted from the text of the study, the study recommended that:

1. The installation must be believable. The driver must be able to perceive a reason for the stop sign which satisfies his requirements for validity. These requirements include low visibility to train detection, high train expectancy, and enforcement.
2. The vehicle-train exposure value should exceed 100. Translated into trains per day and AADT values, this means that the train volumes must be higher than average and AADT's lower than average. At less than three trains per day, the stop sign should not be used without a compelling reason. Rough guidelines are that stop signs are acceptable for an AADT under 2000, temporarily acceptable while awaiting active protection up to 4000 AADT, and impractical above 4000. The vehicle delay imposed by the stop sign and the potential for vehicle-vehicle conflicts should be acceptable at these levels.
3. The driver should be unable to adequately detect trains unless he nearly stops. It is also necessary that the driver be able to perceive that a stop may be required.

1/ Average annual daily traffic (AADT) count times the number of trains per day.

4. The level of enforcement must be at least equal to that applied to intersection stop signs. The courts must also agree that the offense of failure to stop is equal for grade crossings and intersections.
5. The stop sign must be selectively used so that expectancy is reinforced. If a driver is exposed to improperly used grade crossing stop signs, his respect for those which are properly used will be reduced. (The driver does not confuse intersection applications with grade crossing applications.)
6. A high level of traffic engineering is required so that hazardous traffic conflicts are not created at nearby locations by the grade crossing stop sign.
7. The stop sign installation must be treated as a system, including proper deployment and maintenance of advance warning for both the grade crossing and the stop sign.
8. The crossing must be periodically reviewed to insure that the original conditions which prompted the stop sign use still exist. 2/

The Safety Board recognizes that requirement No. 4 may be difficult to achieve because of the rural area in which this crossing is located. However, we believe that, even with limited enforcement, a STOP sign will succeed in imposing proper driver behavior for detection and avoidance of trains at this location.

The Safety Board also agrees with the Manual on Uniform Traffic Control Devices, promulgated by the Federal Highway Administration which states that "...STOP signs should be an interim use period during which plans for lights, gates or other means of control are being prepared." 3/ Because of the hazardous approach to this railroad crossing and the potential for catastrophic accidents between high speed passenger trains and motor vehicles, particularly heavy trucks, STOP and STOP AHEAD signs should be installed immediately as an interim protective measure.

Therefore, the National Transportation Safety Board recommends that the State of Alabama:

Install STOP and STOP AHEAD signs immediately on County Road 42 where it intersects the tracks of the Southern Railway Company. (Class I, Urgent Action) (R-82-113)

Immediately repaint the STOP line east of the tracks and the centerline on both approaches of County Road 42 to the Southern Railway Company track. (Class I, Urgent Action) (R-82-114)

2/ U.S. Department of Transportation, Report No. FHWA-RD-78-40, "Safe Features of Stop Signs at Rail-Highway Crossings," Vol. I, Executive Summary, April 1978, Final Report, pp. 11-12.

3/ U.S. Department of Transportation, Manual on Uniform Traffic Control Devices, 1978, p. 2B-3.

Complete the review of the recommendations of the diagnostic team that examined the Southern Railway System, County Road 42 crossing on October 4, 1982, and develop appropriate additional action as necessary. (Class II, Priority Action) (R-82-115)

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." (P.L. 93-633). The Safety Board is vitally interested in any actions taken as a result of its safety recommendations. Therefore, we would appreciate a response from you regarding action taken or contemplated with respect to the recommendations in this letter.

BURNETT, Chairman, McADAMS, and ENGEN, Members, concurred in these recommendations. GOLDMAN, Vice Chairman, and BURSLEY, Member did not concur.

FOR *James H. McAdams*
By: Jim Burnett
Chairman