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NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: August 23, 1977

Forwarded to:

Honorable William M. Cox
Administrator
Federal Highway Administration
Washington, D.C. 20590

Honorable John M. Sullivan
Administrator
Federal Railroad Administration
Washington, D.C. 20590

SAFETY RECOMMENDATION(S)

H-77-9

On August 8, 1976, Burlington Northern freight train No. 100 struck a church-owned bus at the Beaver Avenue railroad/highway grade crossing in Stratton, Nebraska. The train was traveling at 57 mph and the bus was moving through the crossing when impact occurred. The impact severely damaged the bus and 16 of its 17 occupants were ejected. Nine of the occupants, including the busdriver, were killed and the other passengers were injured. ^{1/}

The busdriver was familiar with the crossing which was protected by a crossbuck, a wigwag signal, and a bell. The warning devices were activated as the train approached the crossing. A witness stated that the wigwag signal was working and that the bell was ringing. He also heard the train horn and saw the two fixed headlights illuminated on the approaching locomotive. The bus proceeded onto the main track without appearing to either slow down or accelerate to avoid the train.

The Federal Railroad Administration study "The Visibility and Audibility of Trains Approaching Rail-Highway Grade Crossings" (1971) concludes that "...the present railroad horns cannot warn motorists reliably when either the train or the motor vehicle is going very fast." In this accident when the train was within 300 feet of the crossing and well within the audibility range, the bus was still 84 feet from the crossing. At a calculated speed of 18 mph the bus had the braking capability of stopping short of the crossing and avoiding the collision.

1/ For more detailed information on this accident, read: NTSB Accident Report, "Collision of a Burlington Northern Freight Train With a Bus, Stratton, Nebraska, August 8, 1976." (RHR-77-1)

There are a number of factors that could have preoccupied the driver and interfered with the driver's hearing and seeing the warning devices and the train. A number of conditions were considered:

1. The driver upshifted at least once and was probably running in second gear.
2. Noise from the singing occupants of the bus might have combined with the engine and drive line noise to interfere with the sound of the warning bell and train horn.
3. Once the bus was closer than 75 feet to the crossing, the sunvisor in the down position would have obstructed the driver's view of the 12-foot 2-inch high wigwag signal, if he did not lower his line of vision.
4. The train was 1 hour late and may not have been expected.
5. Observations and measurements made from within a similar bus determined that it was possible that the right A-pillar and the outside-mounted rearview mirror, and a tree in a field may have combined to obstruct the driver's opportunity to see the approaching train.
6. The contrast between the green locomotive and dark-colored freight cars and the background was low.

Following its investigation of a grade crossing accident near Waterloo, Nebraska, ^{2/} on October 2, 1967, the National Transportation Safety Board recommended to the Federal Highway Administration and the Federal Railroad Administration that they study the questionable audibility of external sound signals within motor vehicles. Upon completion of the recommended study the Federal Railroad Administration published a report in May 1971, "The Visibility and Audibility of Trains Approaching Rail-Highway Grade Crossings."

The FRA report concludes that "...present railroad horns cannot warn motorists reliably when either the train or the motor vehicle is going very fast. To 'warn' a motorist, the sound must penetrate into his vehicle and override ambient noise to alert him, while the vehicle is far enough away from the crossing to still be able to stop. It is not suggested that horns are seldom heard by motorists, but rather, that they fail to reach some motorists and are thus questionable as primary warning devices."

2/ NTSB Report: "Waterloo, Nebraska, Public Schoolbus Union Pacific Railroad Company Freight Train Accident, Waterloo, Nebraska, October 2, 1967." (NTSB SS-R/H-3)

According to the FRA report, the range at which the warning must alert the motorist is that distance from the train to the vehicle at which the motorist must be alerted if he is to stop on time. In the Stratton accident, when the train was 300 feet from the crossing the bus was 84 feet from the crossing and well within the range of the horn to be audible. The busdriver still had about 3.6 seconds to hear, perceive, react, and stop the bus.

Since Beaver Avenue is the only paved southbound thoroughfare out of Stratton, it is an important segment of the local transportation system. Some 400 motor vehicles and 8 to 9 trains use this crossing daily. Under the circumstances, the Beaver Avenue railroad/highway grade crossing is considered to be a major crossing and could not be eliminated.


The circumstances of this accident clearly indicate that in spite of the operations of the wigwag signal and the train horn, and the illumination of the locomotive headlights, the busdriver was not alerted to the approaching train. It also demonstrates that this crossing poses a serious hazard to the inattentive driver. Accident data show that a majority of those involved in grade crossing accidents are familiar with the crossing and in spite of the driver's perception of a potential hazard at the crossing, a habit of inattention is formed after repeated crossings without the presence of a train. Something more is needed to attract the attention of these motorists to the hazard.

One such system that can be considered is the traffic-activated highway traffic light signal. Motorists are familiar with the signal, observed compliance by motorists is excellent, violations are enforceable, and they would be no more expensive to install, operate, and maintain than are flashing lights. The device would display a red signal only when a train was approaching. It could be activated in the same manner as current electrically operated control devices.

Therefore, the National Transportation Safety Board recommends that the Federal Highway Administration and Federal Railroad Administration:

Combine efforts to develop and implement a uniform system of warnings to attract the attention of motor vehicle drivers approaching railroad/highway grade crossings. (Class III, Longer Term Followup) (H-77-9)

BAILEY, Vice Chairman, McADAMS and HOGUE, Members, concurred in the above recommendation. TODD, Chairman, and HALEY, Member, did not participate.

for 
By: Webster B. Todd, Jr.
Chairman